



THE 5TH
ANNUAL
UNDERGRADUATE
RESEARCH
CONFERENCE
ON APPLIED COMPUTING
(URC 2013)

RESEARCH | INNOVATE | PROSPER

BOOK OF ABSTRACTS

MAY 1 & 2, 2013 / ZAYED UNIVERSITY / DUBAI CAMPUS

HOSTED BY
COLLEGE OF TECHNOLOGICAL INNOVATION
ZAYED UNIVERSITY
DUBAI, UNITED ARAB EMIRATES



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Message from VICE PRESIDENT Zayed University



Welcome to Zayed University and the Fifth Annual Undergraduate Research Conference on Applied Computing! We are proud to host this conference that focuses on undergraduate research. Zayed University has always been at the forefront in developing programs that help foster problem solving and critical thinking skills in undergraduate education.

Research is part of our institutional culture. With the fifth edition of this exceptionally successful conference, Zayed University is pleased to provide undergraduate students, from all across the Arab world, with a unique opportunity to showcase their research and create opportunities for future collaborations. Universities in the region have great potential for collaborative research across institutions and with industry. We believe this conference serves as a forum to encourage and facilitate collaborative research.

Research is a great tool that can be used to increase our level of knowledge and help us solve many of the problems we face today. Zayed University recognizes that valuable research and creative activity mark a great university.

We are grateful to the College of Technological Innovation for hosting this important event. Special thanks to all who have worked towards making this conference a great success. In particular, I acknowledge the hard work, enthusiasm, and dedication of the organizing committee, staff, and student volunteers in organizing this conference.

I wish you success.

Dr. Sulaiman Al Jassim

Vice President, Zayed University



Message from CONFERENCE CHAIRS



Welcome to the 5th Annual Undergraduate Research Conference on Applied Computing (URC 2013) whose objective is to promote undergraduate research activity at educational institutions across the Arab world by providing a forum for undergraduate students to present their research projects and to interact with other young researchers, faculty members, and technology leaders from the region.

This year we are excited to welcome student researchers and their faculty advisors from many more educational institutions in the Gulf region and other Arab countries, including Egypt, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, and Saudi Arabia.

Contained in this ebook, you'll find one hundred and eighty two abstracts representing undergraduate student research projects from many universities in the Arab world. The abstracts reflect the multidisciplinary character and wide spectrum of emerging technologies. The research projects will be presented in oral and poster presentation styles.

We would like to thank everyone involved in this conference. Without the students' submissions, and the volunteers who reviewed them, this conference would not have been possible. We would also like to extend our special thanks to the keynote speakers, and members of the panel discussion, for taking the time out of their busy schedules to participate in this conference.

We are grateful to our sponsors, Zayed University Office of Research and emertech, for their continued commitment to URC. Your generous contribution helped make the conference a reality. Thank you.

Our thanks go to everyone who has contributed to making this conference a great success. We would like to extend a heart-felt thank you for the rest of our team: May AlTaei, Zakaria Maamar, Huwida Said, Mario Guimaraes, Faouzi Kamoun, Omar AlFandi, Farkhund Iqbal, Abdallah Tubaishat, Mona Bader, Izzeddin Asad, Ibrahim Baggili, Andrew Marrington, Munir Majdalawieh, Hamda Al Ali, Hind AlDosari, Emad Bataineh, and Nagaraj Chandrashekrana; we couldn't have done it without you!

Finally, we take this opportunity to thank Zayed University for hosting this conference and providing the needed resources.

We hope you enjoy the conference and the lovely city of Dubai.

Conference Co-Chairs

Qusay H. Mahmoud and Leon Jololian



URC 2013 CONFERENCE ORGANIZERS

Unless otherwise noted, all organizers are with the College of Technological innovation, Zayed University, UAE.

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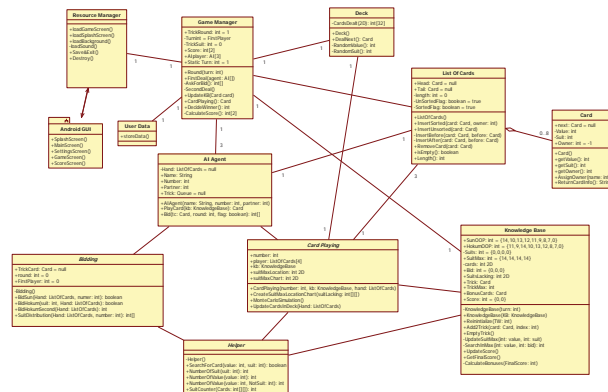
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The aim of this project is to design and implement an artificial intelligent agent that can play an imperfect information game as good as an expert player. The imperfect information game I have chosen to implement, an AI agent to play, is Baloot. After thoroughly analyzing and designing the game I have begun implementing the design on the Android platform. After the complete implementation of the system and the artificial intelligent agent, the next step would be designing the games graphics on the Android platform. Although the graphics are not my main concern, they should at least be appealing enough to be competitive with similar games in the Google Play Store.

The first obstacle I need to surmount is designing the games logic based on the rules of the game and the necessary data structures that adequately store the artificial intelligent agents knowledge base. The next step would be designing the artificial intelligent agent to process the knowledge base efficiently in order to make an informed decision. There are various algorithms and heuristics that have been used to solve the problem of games with imperfect information. I intend to use the concept of the Monte Carlo Simulation along with various algorithms of my own concoction in order to solve the problem. The following diagram is a class diagram representing the complete structure of the game, which will be implemented in Java.



The Monte Carlo Simulation basically takes random sampling to obtain a result. For the purpose of this project the Simulation will be used to randomly deal the remaining 24 cards the artificial intelligent agent does not have access to. The game is then played to completion as if it were a perfect information game. This process is then repeated multiple times for each possible card that can be played while storing the final score of each simulation. The card that has the highest average is the card that is played.

Fifth Annual Undergraduate Research Conference on Applied Computing
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Remote Patient Monitoring System

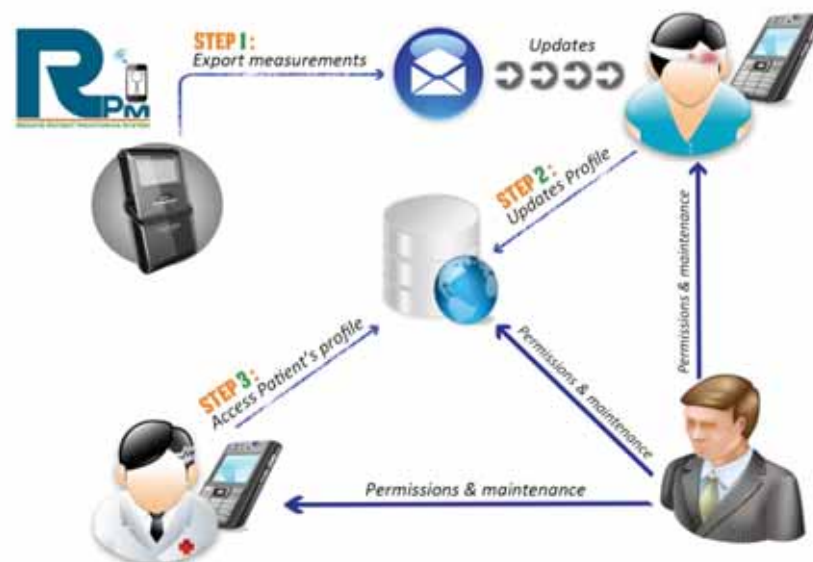
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ABSTRACT

There is no doubt that the quality of care is one of the most important issues for the health care providers as well as the patients themselves. The outpatient is the patient visits the hospital or clinic on demand. So continuous and close monitoring which is provided to the inpatient as well as the updated medical information help improving the quality of care and effective procedure, hence fast recovery. There are many of chronic diseases' (diabetes and blood pressure) patients compared to the available number of hospitals. These types of patients need continuous-periodical monitoring and special care from their supervisor doctors. Health awareness, periodical health monitoring and taking medicines in their time all are basic factors for maintaining a good health condition.

The recent progress of Information Communication Technology (ICT) applications in healthcare makes it possible to establish good and useful applications. Many health applications are available nowadays; however, none of them is considered as a hub for all of them. For example; we may find a perfect health application that is dedicated for a single device that measure a single health issue (e.g. sugar blood) but you may not find a single application that takes all other health application's measure and analyze them for a better off-door doctor monitoring. That is exactly what Remote Patient Monitoring System (RPMS) do, the purpose of this project is to develop a monitoring mobile application for a chronic diseases' patient that has the ability to save their times and improving their health through some functionality.

The following are the main RPMS's provided functions to the user: enabling the doctor to monitor his patients' medical records from every where at any time, direct communication between the patient and the supervisor doctor through messages, enabling the patient to choose his doctor freely from his/her home, enabling the doctor to prove or deny patient's requested to supervise, provide some healthy tips for a better medical conditions, calculate the patient ideal weight, calculate the patient's calories per a day or several days and finally enabling the patient to set alarm that remind him/her of their medicine time. RPMS provide the ultimate solutions for those who suffer from a combination of chronic diseases and waste a lot of time and effort for communicating with their doctors. It saves their time by enabling them to communicate freely with their doctors from home. It also, enables the doctor to freely monitoring his patient's medical reports and messages any time anywhere. The chosen platform for this system is the smartphone because of their popularity, availability and usability as well. Eventually, we hope to fill the gap between the outpatients and the inpatients through.





Sugar Counter Application

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ABSTRACT

According to International Diabetes Federation, up to 366 million people have diabetes. Saudi Arabia, Qatar, United Arab of Emirate and Kuwait are among the top ten of highest prevalence and without effective prevention and control programs, diabetes is likely to continue to increase globally.

There are two types of diabetes; type one and type two. Type one develops when the body is unable to produce any insulin. Type 2 diabetes occurs when the body is able to produce insulin, but not enough for it to function properly, or when the cells in the body do not react to insulin.

Diabetes-related complications including cardiovascular results in substantial economic burden on public health services. Standard care of diabetic patients consists of regular visits to diabetics care team, insulin intake, adherence to a special diet, exercise and medication. For many diabetics, managing their diabetes is not only a confusing process, but also time consuming and overwhelming. Diabetic patients need to inject insulin few times a day by using insulin pumps or insulin pens, they have to manually calculate the amount of injected insulin according to their food intake and moreover doses should be adjusted according to pre-meal sugar level.

Motivated by the diabetes epidemics in Saudi Arabia and the above-mentioned problems, the idea of Sugar Counter Application (SCA) was raised. The purpose of SCA is to develop an efficient mobile application that assist patients to manage their diabetes to adhere to a balanced and healthy lifestyle by following the American Diabetes Association (ADA) guidelines and recommendations.

SCA is a Java Android based application for Arabic language speakers. The Android platform was chosen for its portability and usability. The application provides different services suitable for all age groups. These services include carbohydrate calculation in variety of food, to help diabetics by calculating the recommended insulin doses before meals. The application also assists patients to adjust their insulin doses based on meals and daily activities. Additionally, the application provides educational steps to follow when sugar runs high or low. SCA will help reduce the doctors' time spent on educating each patient on how to perform carbohydrates and insulin calculations. SCA is implemented using java, xml for interfaces and SQLite database. The application is now at the implementation stage. It will be evaluated by real diabetic patients and monitored by physicians to ensure that the system is free from errors and bugs and achieves its objectives.

By recognizing the seriousness of the diabetic disease and frequent calls for help during critical sugar readings, we have added an alert button. The button delivers a series of alerting messages to a previously stored contact list in case of emergency besides a tracking location service so the patient's place will be identified.

In conclusion, this research presents a mobile application designed and built based on diabetic patient's daily requirements to manage their carbohydrate and insulin doses, as well as maintain a balanced daily routine. In addition, it generates accurate reports that can be monitored by the care team. Dieticians and real patients will carry out usability testing to evaluate the application in the testing phase.



Electronic Board: An Effective Framework for Interactive Academic Portal

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ABSTRACT

Electronic Board framework is an interactive system that shall be built for the female section of the Faculty of Computing and Information Technology (FCIT) in King Abdul-Aziz University. The purpose of this system is to provide all relevant information to the academics enabling effective communication and exchange of course materials (i.e. lectures, assignments, projects...etc.) between instructors and students through a single platform. The types of users are instructors, students and system administrator.

The default situation is that the instructors have to create a group on the social networks (i.e. Yahoo groups, Facebook groups ...etc.) to communicate with students for each course they teach. This procedure is also done again by the lab instructor causing confusion and also misleading the students due to separate groups with no links between them, and it is also time consuming.

Although FCIT has a Modular Object-Oriented Dynamic Learning Environment (Moodle) system, this is not effective for the female section as there are shared courses between the males and females, this means that the male instructors teach the female sections through the system but the female lab instructors cannot upload the lab materials because it will be mixed with the male section's materials. It is an accredit system but it can be moderated only by the male section. This leads to the student's dispersion because of the multiple way of communication. These problems have motivated the selection of this project of using the Electronic Board Framework System which the faculty personnel and students can communicate effectively. Several websites related to the domain of the project were visited so as to ensure our understanding of the system functionality, learn from the experience therein, support our ideas, and evaluate these websites for improvements and extra features that are offered through this system.

Electronic Board System will provide the following services:

- The Instructor can add/edit her profile, course description, upload the content for each course taken by her, chatting with her students and receive assignments from them. She can also send announcements to be up to date with her students and add blogs.
- Students can chat with their instructors and receive the announcements from them, edit their profiles, upload their projects and assignments. They can also comment on the blogs written by their instructors.
- The System administrator has the ability to create/edit/delete accounts for all users (instructors and students). She fills the database with all the faculty courses and sections related to each course and identify either it is a lecture or a lab. She also links each instructor and student with the courses sections that are related to their schedules. At the end of each semester, she can delete all the courses sections or delete all the courses sections for all the instructors and students. In addition, she can produce and summarize reports about important information and print them. Finally, the administrator has the authority to access the database and make the necessary changes like deleting the uploaded files and announcements at the end of the semesters.



Find My Way: A Mobile Navigation Application for KSU's female campus

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ABSTRACT

Each year new students, faculty and staff join King Saud University. Many visitors and guest speakers visit KSU to attend different kinds of events. They often face difficulties navigating around the campus. The problem will rise even more when KSU's female centers soon moves to the new campus. Find My Way (FMW) project aims to produce a mobile navigation application for the new female campus.

In designing FMW, we followed the User Centered Design approach that involves target users in the design cycle as well as in the evaluation. A survey and a literature review of similar product have been conducted to find out most useful functions to provide. In fact, several commercial navigation applications provide users with directions from one place to another. However, these applications only work along existing roads across cities and countries, don't provide any further information about places, and most of them need internet connection which isn't always available. To overcome that, FMW will include two interactive maps: an online map and an offline map, both with precise routes inside the campus and a comprehensive guide with detailed information about the different buildings.

FMW is built on Android OS platform and integrates GPS technology to acquire user location. Optimization techniques are applied to compute routes; the campus is represented as a Graph structure and the Dijkstra's algorithm is used to calculate the shortest paths. In addition to this, we explore the challenge of designing an efficient and intuitive interface that is clear enough for both inexperienced and experienced users [See Figure 1].

FMW is envisioned to help KSU members in the process of moving to the new campus and it would be a useful tool for every newcomer to the university in the future. FMW would be even extendable to handle other buildings complex to serve the same need and especially the educational ones like other universities' campuses.



Figure 1: FMW main interface



EZ PDF_Writer (PDF file editing tool)

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ABSTRACT

Portable Document Format (PDF) is a universal file format that preserves fonts, images, and layout of source documents created on a wide range of applications and platforms. PDF is the standard for the secure, reliable distribution and exchange of electronic documents and forms around the world..While PDF Files are “read only” by default, there are ways by which you can edit certain elements of a PDF document for free without requiring the source files or any of the commercial PDF editing tools.

Occasionally, document users need to do extensive editing directly to a PDF files. Our proposed application will provides an environment to edit PDF documents by considering the file as fixed image and the editing would be overlapped on this image. In this project, we will use a special library with lots of subroutines to facilitate handling this type of functionality ,and algorithms such as image processing algorithm ,drawing algorithm to accomplish the application objectives.

Our proposed project should provide immediate PDF document editing ,annotation feature added - Sticky Note (or memo), Activate with a long click on any place in PDF, it could be on text, image, or background. In order to edit, delete or change properties (name of the memo, author, color or even note icon), just tap the memo icon. Annotation features include - Highlight, Underline, Strikethrough, Commenting on annotation. Changing marking color. Android users who read more can now use their mobile devices or tablets to help instantly edit certain elements of a PDF document by just selecting the menu and choosing the appropriate edit tool.

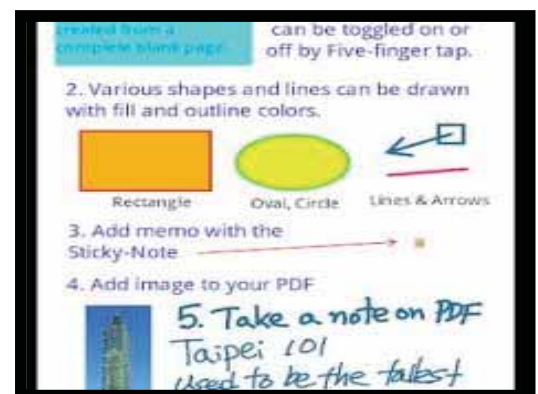


Figure1 : PDF File editing tool

Our project can be summarized as follows : select and open any PDF file ,use the various tools to highlight, write text, draw on it or annotate. There are options to change color, brush thickness, brush type, etc. There is also a handy “eraser” function to erase strokes without having to undo all your handiwork.

other important features of this application:

- Amazingly fast : Share your PDF files through email and Bluetooth without leaving the application.
- Reflow PDFs for easy viewing : Advanced editing with your fingertips, write notes and highlights on the go.
- Easy navigation with bookmark management : Effortlessly search for text.

References :

- [1]speechieapps.com ,ezpdf-reader.
- [2]m.unidocs.com.
- [3][Http://hoffmanmarcom.com/docs/Mobile_device_management_white_paper.pdf](http://hoffmanmarcom.com/docs/Mobile_device_management_white_paper.pdf).
- [4][Http://badpitch.blogspot.com/2012/07/3-hacks-for-editing-pdf-files-and-images.html](http://badpitch.blogspot.com/2012/07/3-hacks-for-editing-pdf-files-and-images.html).



“Wireless Application for Vehicles Control at The Girl’s Section in King AbdulAziz University”

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ABSTRACT

The departure and arrival of the students in girls section at the King AbdulAziz university usually suffers from high traffic during the start and end of each working day. During the rush hours the students, parents, staff members, administrators and taxi drivers are suffering from long waiting time to enter to and exit from the girls section. The existing manual solution failed to solve the excessive congestion that is rapidly increasing day by day. Our suggested solution utilizes the Radio-frequency identification (RFID) technology to reduce traffic congestion, simplify the departure of members and those with special needs. Our system will reduce substantially the waiting time for the students for their vehicles. It will also organize the work of Taxis inside the university; In addition it will considerably improve the security by allowing registered users.

We are going to use object oriented development methodology because of high code reusability, improve reliability and flexibility. The methodology chosen will also allow us to add more features easily and will reduce maintenance time. Our system will be implemented integrating more than one IT technologies, platform and tools i.e. Java, PHP, C# (to program an Android application). The Android application will have a Database (Oracle) at the backend and configuring the RFID-KIT (READER and TAG) to make our system functional.

The final product of our project will include a mobile application program on Android platform for members and taxi drivers that will enable them to register into the system based on these situations:

scenario 1(For Taxis):

The Taxi driver should register into the system and then Members can view the list of available Taxi's.

scenario 2(For personal Vehicles):

The user is required to get his RFID- ACTIVE TAG that has a unique id for each user and it should be attached to his car.

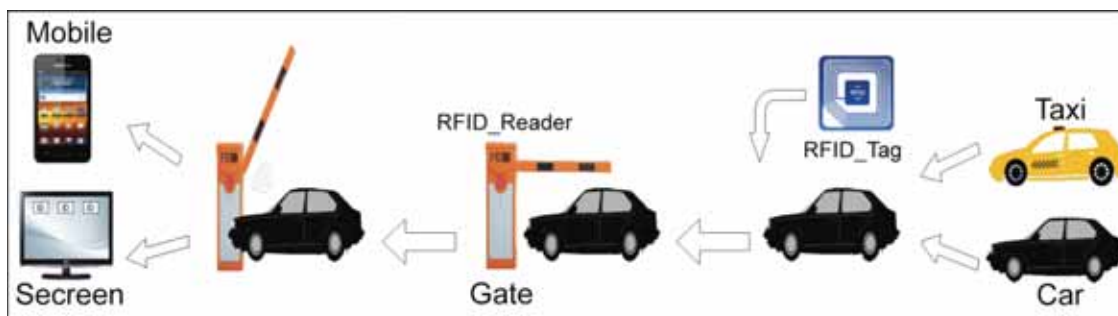


Figure 1. Architetural diagram of the wireless application

The RFID-READER(2.4GHz) will identify each registered user in our system by reading the RFID-ACTIVE TAG(2.4GHz) corresponding to the user, then the RFID-READER will send the unique id to the Database, the Database will check if the user is a registered Member or a registered Taxi. If he is a member, a notification will be send to the user to inform him that the driver is outside waiting for him. If he is a Taxi, he will be available in the reservation list. The taxi driver will receive a notification on his mobile application when member reserve hem (Android platform).



DietAssist: Mobile NFC Enabled Nutritional Shopping Assistant

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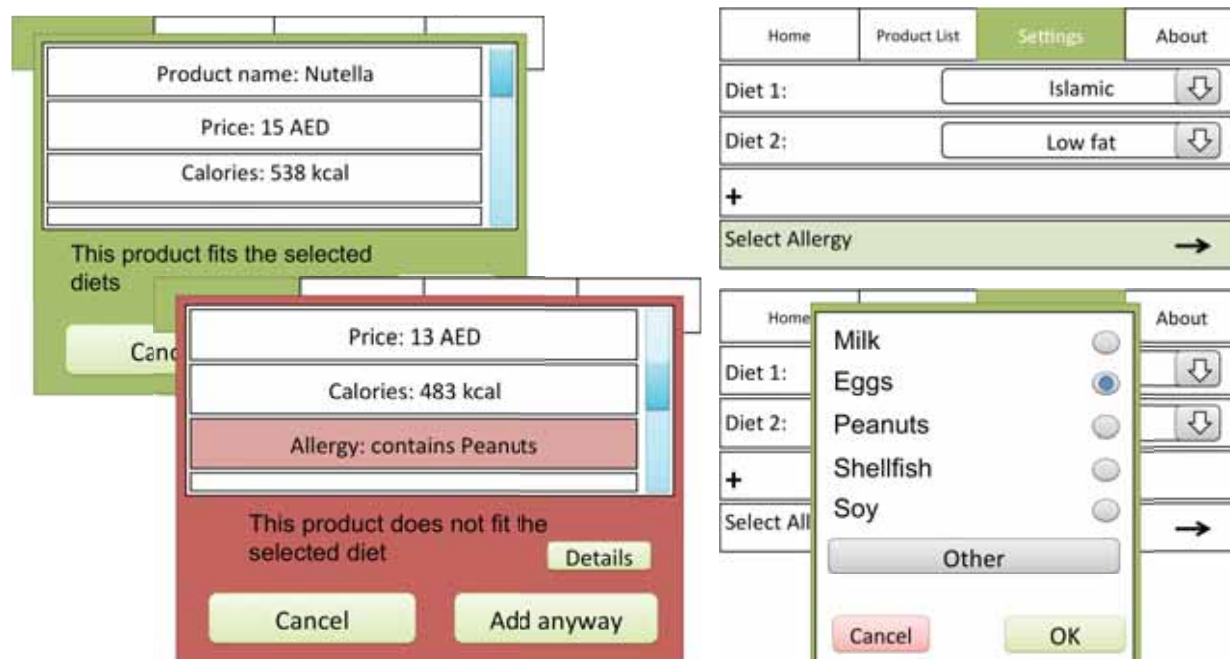
Supervised by
Dr. Sanja Lazarova-Molnar

ABSTRACT

Nowadays, food diets are increasing in popularity. People follow healthy food diets to improve their health, for weight loss or even for weight gain. In addition, some people are allergic to certain food ingredients, or have other medical problems so that they need to follow specific food diets. Some religions have also specific diets that people should follow. It is essential to find a convenient way to filter food products based on these diets. Food products have labels placed on them that contain nutrition facts and ingredients. These labels usually have small text with lots of information. Looking for specific information from these labels can take a long time. People having allergies or following certain food diets face difficulties in reading information on labels. For example, Muslims have to read the whole ingredients list of a product to see if it contains anything prohibited by their religion. Same applies to people with certain diseases; especially older people with impaired vision need an easy way to filter food products based on their health situation. There have been some improvements in displaying information like printing tables on products and writing allergic ingredients in large texts. With these improvements, people still spend time to figure out if a product is suitable or not.

In our graduation project, we are developing an Android application for smartphones that helps people to decide whether the food item is suitable for them or not. The project relies on using Near Field Communication (NFC), a new RFID technology, to provide a fast and simple way to scan products and get information from the tags. Our application will scan food products using NFC. The user will be able to select one or more diets in the application and after scanning a product the application will tell him if the product is suitable or not. Diets will be based on health issues such as “low fat” or “low sugar” diets, religion diets, such as Islamic and Kosher diets, and allergies. This project is aimed to assist food shopping because it will make shopping for suitable food simple and easy using smartphones, which is convenient because no extra equipment is needed. It will also make groceries or large food shopping stores provide a user-friendly technology for customers to help them in their shopping.

In our poster presentation we will showcase the DietAssist application.





RFID LID (Lost Items Detector)

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ABSTRACT

Many people lose their valuable stuff easily nowadays because of rushing all the time, being distracted with their surroundings or having their belongings stolen by thieves in crowded places in a blink of an eye.

All of us have once wished if we had been alarmed before losing our valuable items such as jewelries, mobile phones, bags with important papers or personal items that have high emotional values.

Our project discusses a design of a portable device that alarms the user when a certain object is not around him/her anymore.

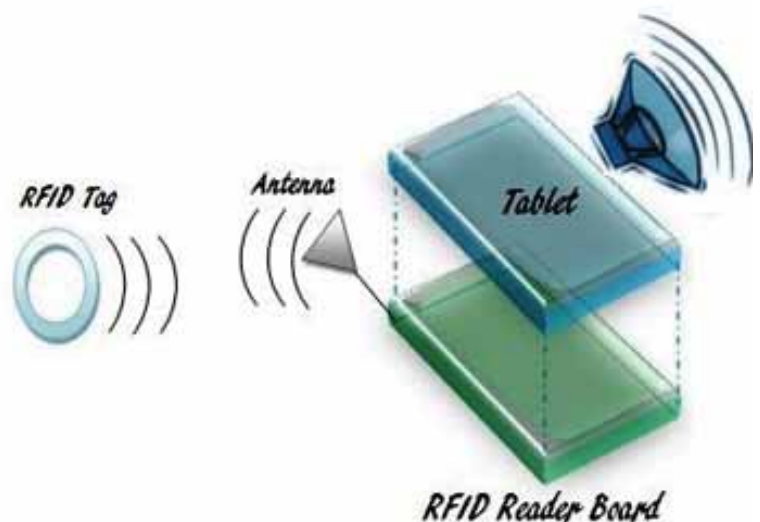
The project is based on the Radio Frequency Identification (RFID) technology. The system contains two main parts, the reader and the tags. The portable reader will be able to communicate with small tags that are fixed on selected objects through the RFID waves. The reader can be connected with several tags at the same time. Different types of tags can be used to be attached to different items (examples include: label tags that can stick on different objects, card tags for wallets, key chain tags and jewelry tags), that can be found in different RFID stores.

The reader board contains an RFID reader chip connected to a micro-controller. The RFID chip transmits waves using an antenna that is connected to the board. Tags which are in the range of the reader will respond to the reader with their own waves carrying their unique codes. When one or more of the tags are no longer in the range of the reader they won't be able to respond to the reader's signal.

The data obtained in the reader board will be sent to a tablet or a handheld windows device which will be placed on the top of the reader board to minimize the size of the system through a USB cable. The tablet will include an application (user interface) that will guide the user to select what tags to use, and then start an alarm whenever one or more of his/her items is no longer in range to grab their attention that items might have been lost.

In our design we have selected the ultra high frequency (UHF) range and selected an antenna to give us a reading range of 1 to 2 meters which suits our application the best, however the UHF range can reach to tens of meters with different antennas.

The development environment used to write and edit the program's code is Microsoft Visual Studio.





KAU Personal Guider (MyKAU)

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ABSTRACT

The population of King Abdul-Aziz University has been increasing over the years, and the more students you have, the more classrooms you will need to encapsulate them, hence new buildings are required. Freshman students and faculty members in the beginning of every new semester find it difficult to reach Classrooms and new buildings; some even continue to suffer for two to three weeks that may lead to the delay or absence from lectures.

Nowadays, we witness the amazing breakthrough of smartphones. World is going mobile! Most of The transactions are done by few touches with smartphones. A need to utilize and enhance the existing Smartphone technology in solving the problem mentioned earlier was a big inspiration for us. We are going to develop an Android application MyKAU for king Abdul-Aziz university users, that will utilize the GPS (global positioning system) technology along with other methods of our own to provide helpful directions in the whole university for everyone who needs it.

When you open the application for the first time, you will need to add your class schedule, you will be notified whenever there is a class coming up soon, with the ability of showing the path on map to the place where your lecture is being held. From there you can mark the place, add to favorite. You can always modify the class schedule you made. MyKAU is going to make sure that all users will get the help they need in directions inside KAU and make it a lot easier to reach their destination.

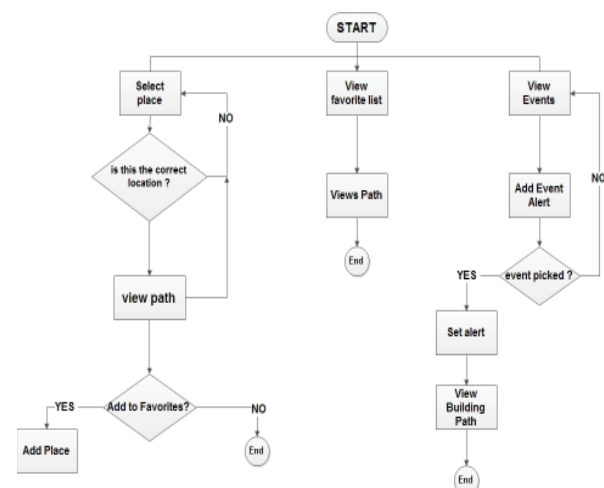


Figure 1.Flow chart of the system



Reaching the destination with ease and simplicity without the need to ask for places, roads, will lead our users to thank the technology. Our system will make it easier to develop a list of all favorite locations to be utilized later on while going to the same location again, with the ability to Flag the spot on the map.

We use Android technology because it gives everything you need to build best-in-class app practices. It gives you a single application model that lets deploy the apps largely to hundreds of millions of users across a wide range of devices—from phones to tablets and beyond.

MyKAU in its final output is expected to deliver the ability to locate all buildings, exam halls, the ability to search for specific buildings, classrooms, showing a path on the map to make it easier in reaching the destination and the ability to mark / flag a place on the map.



Quick List Search Android Application (QLSAA)

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ABSTRACT

Quick List Search Android Application is an application that will solve a major problem represented in managing time and efforts for making an online reservation by smart phones to find nearest hospitals/clinics. It will work with emergency cases to show the waiting queue line (updated by passing time) inside each department of each hospital.

Some efforts are needed to search for the nearest hospital that does not have crowded waiting queues for the required doctor and in the same time you want the nearest hospital from your location. After you decide to choose hospital/clinic based on a criteria of waiting queue and nearest hospital, you can get the shortest path or best path that is not crowded from your location to the selected hospital represented on the map and the user will get the distance in kilometer. The application becomes necessary for a user who is a new resident in a city and needs to go to a nearest hospital in normal cases or in emergency cases. Therefore,

Using this tool and making a reservation through it to a specific doctor in a department in a specific hospital, it will get the shortest direction by map. This situation is better than starting search for the nearest hospitals by asking people around and tracking signboards direction. Moreover, after wasting time through following wrong directions, a user may reach a hospital and he/she needs to wait until his/her turn comes. There is also other unforeseen problem that our application will deal with, such as sometimes the nearest hospital to the user has more patients waiting in the queue, although a hospital is not that far from a user and it has less number of patients. Therefore, it is recommended to choose the second one. Our system will ensure time management by a patient coming nearly on his/her time by means of looking to the application on his/her smart phone. Making the hospital to be capable to accommodate more people and increases its productivity.



We will use Throwaway prototyping methodology that is appropriate with the nature of our project, excellent choice when timelines are short and its appropriate when system reliability needed. The point is obtained after conducting an online survey and analyzing its result.

In order to avoid all the above obstacles, We will make an application as shown in the figure that finds the nearest hospitals from the user with less number of waiting queues in that hospital. It has also the capability to reserve and track the map that facilitates the difficulty that a user may face usually by showing him/her the shortest or best direction to the hospital location. There will be an emergency button that passes the user's information before the user reaches that hospital. And we will add an evaluation window for doctors in hospitals and reviews among the users to select the best doctor or who has the best rate and good evaluation.



Intelligent Academic Services (IAS)

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Supervised by
Dr.AbdulFattah Mashat

ABSTRACT

During our study of the ODUS(On demand University system) plus Academic system (Banner based), we observe that there are some problems and difficulties that in our search for problems or difficulties faced by the system users: students, administrators and academic members during the start of each semester of an academic year at king Abdul-Aziz university.

Our suggested system will comprise of an android phone application to serve smart phones users. We did literature search about the famous system that is available i.e. the Banner System. Based on our collected information to gather all the advantages of this system, we are going to apply those in our system. IAS in its final output will be able to solve the problems of: Wasting time during add & drop action ,difficulties to understand the process of add & drop ,difficulties with the academic schedules ,localization difficult inside the University campus ,difficulties with dates scheduling: exams, assignments, and other events ,difficulties with communication between student and each other ,difficulties in communication between the academic members and students.



Fig.1: The architectural diagram of the system

We presented our project as a suggestion / solution in the survey that we conducted from the users (students and academic staff) of the university. We asked them to give us their opinion on acquiring such an application for the academic affairs of the university. The data that we collected revealed mixed opinion but mostly in favor of our system (94% of student have smartphone, 99% of student prefer to do this services on smartphone).

As it can be seen in fig.1 the smartphone implementation uses different integrated IT technologies to achieve our system. These technologies include GPS (global positioning system) and client server. The application will connect to ODUS Plus server to get the student information and building names, the application then bond with IAS server to obtain longitude and latitude of the buildings. After that the application will connect to GPS to determine the user location and keep tracking where the buildings are located.



Rain Emergency System for Altering Traffic Directions inside KAU

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Supervised by
Mr.Maged Alsheshtawi

ABSTRACT

No secret to everyone the importance of providing ways and means of safety at every place where we find ourselves in trouble. Few years ago a shocking news erupted (in Arab news, Reuters) that floods hit the eastern part of Jeddah (Saudi Arabia) causing 4.5 Million Dollars of damages. Although there are a scarcity of rains in Jeddah but when it rains, the city get confused and in panic resulting in bringing almost all activities, especially traffic to a halt. The accumulation of cars at the entrances and exits of the university gates is a big problem facing all visitors to the university especially during the time of rain.

We want to build a system that will help to get rid of the problems that occur because of the rain. Water level detection sensors will be placed in specific points at KAU which had a high level of floods during the past. These sensors are connected with electronic circuit that sends the data to a computer via a Mobile slice (chip). And information is displayed on the computer as a map with different colors. For example, green color for lower level of the water and blue for average and orange for high and red shows that the level of water is very dangerous. The colored map generated by our system will help Department of safety and security in KAU to tell a Civil Defense Department for helping the people by sending message to students and university employees to stay away from dangerous places. The warning messages will also appears on the information screens that are fixed in different places inside the KAU campus for visitors.



Fig 1. Architctural diagram of the system

The system will utilize all the numbers within the database of university to send SMS messages and warning alerts to all members. The system will allow displaying warnings and other necessary evacuation information on the University screens, for the people having no numbers in the university database like the visitors.

As shown in the figure 1, the sensor begins measuring the level of rain against the preset threshold that we set our sensor to. Sensors are linked to the server. All sensors send data after regular interval to the mobile chip of the first server in the locations sensors which is then communicated to the other server located in the Department of Security And Safety. This server marks the map with colors in the map of the university depending on the data received.

Our system addresses an important problem that is faced by the department of safety and security in king Abdul-Aziz University (KAU), which may help them to help people by detecting places filled by rain and clarify which is the safest and suitable place to pass out of the university. This will reduce congestion and will avoid the deadlock on roads inside the university by sending warning messages to students, faculty members and all university staff or visitors.



Smart Blood Donation System (SBDS)

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Supervised by:
Dr.Fuad Bajaber and Eng.Fazal Qudus Khan

ABSTRACT

In health related emergency situations, the needs of blood has been found to be the most demanding entity. In Saudi Arabia we have a lot of people who wish to donate. But at times we are suffering from lack of blood in blood banks, the reason being there is no connection between the blood banks and the donors.

In this technological era, the blood donation problems have been handled by different tools like the announcement using the SMS or a social website. Some non-commercial websites has been created such as "freeblood" and "UAE donors". There are systems (websites and applications) around the world that present some solution to the problem we are addressing, but most of them are similar and have disadvantages. The main drawback in the existing systems that we have studied so far is it contains static information in the database, which needs hard work to update (Lack of a dynamic solution). The location of donors and response time need to be determined and to be updated fast as soon as possible.

As depicted in figure 1, our system is aimed at enhancing the Smartphone technology to replace the old donors' lists and all the old paper work with really easy system that can find the donors based on some data and criteria. So Hospitals and the people who need blood can find them easily by their nearest location, available time, and same blood type. Our system at in its final version will be able to facilitate the search process for needy people and make it easier than before. Increase number of donors by increasing the facilities provided to them and Increase the awareness of the society about the importance of blood donation.

In our research we used throwaway prototyping model. It is a software development methodology, where the requirements of the system are validated through a prototype. After that we can take suggestions and additions for the system. The final deliverables of the system will consists of a web system and mobile application

- **Web System:**

Hospitals can find donors easily by their nearest location considering their free times, blood type, and last donation time and send a notification message to them. Hospitals can easily access and update donor's info, also insert donors' blood tests.

- **Mobile App:**

The system takes the user's location via GPS and updating their location automatically or as the user's choice and it receives notifications from the hospital. Also, the user can perform all the web operations by the mobile app.

The final product of our research is an integrated system (combining multiple technologies) to achieve the goals of the research. The system will be able to facilitate the communication between the donors, hospitals, and needy people which will effect positively on the number of donors. Also SBDS will be able to manage, hold, and process the donors' data to mine and extract important information that is related to their tests and health which may save their lives in the future.

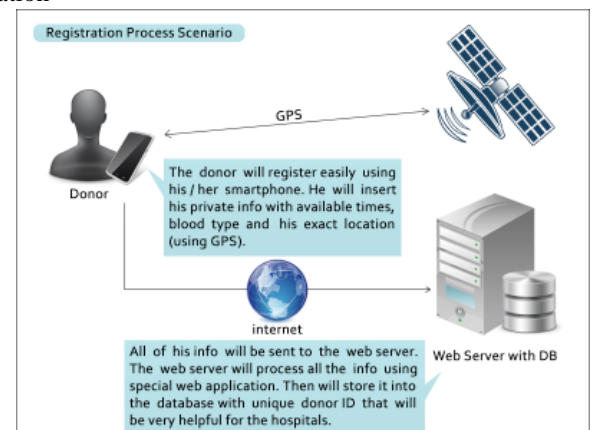


Figure 1. architectural diagram of the system



Cardiac Patient rescuing System

AbdulRahman Khan, AbdulRahman Ghabban, Osama Ghabban, Dr Mohammed Khamis
King AbdulAziz University, Jeddah, Saudi Arabia

ABSTRACT

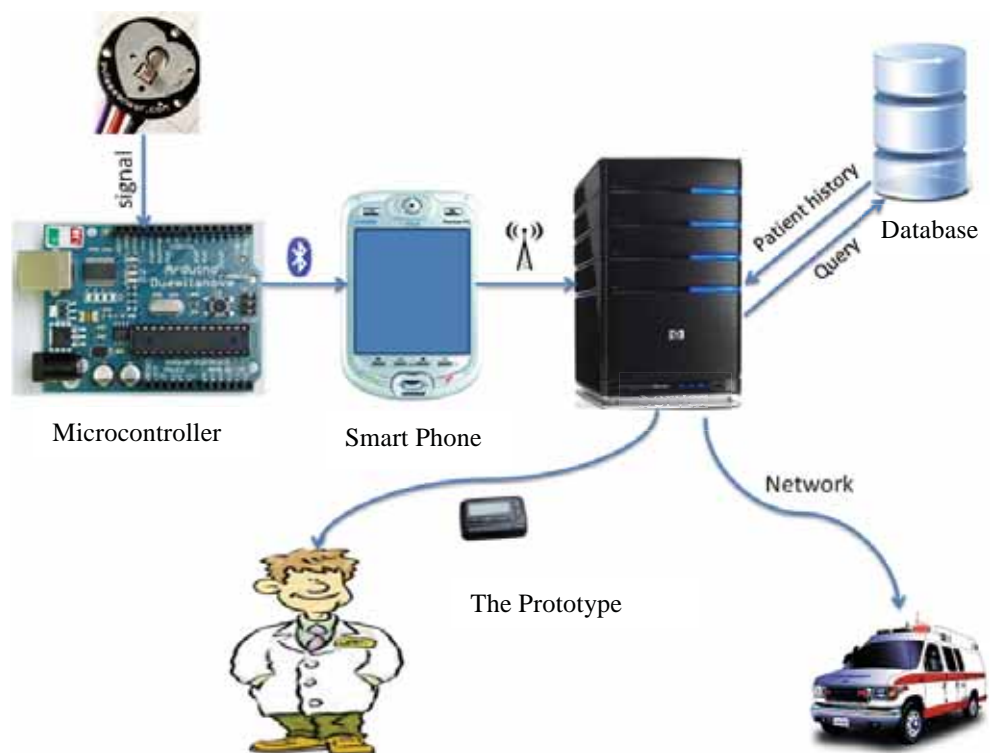
Heart attacks are one of the most common causes of human death. The seeking for a technique to monitor patients electronically for early rescuing is vital. As the time is critical factor in rescuing such kind of patients, developing remote human's heart monitoring system is very useful. With the spreading of smart mobile phones equipped with GPS technology, text messages through GSM network or exchanging different media through the Wi-Fi or Bluetooth, it became visible to build system to integrate all these technologies. In order to achieve the task of the remote monitoring of sensors equipped with cardiac patients for sensing any abnormal changes and to report that to remote emergency monitoring center.

The prototype project of such system comprises of three modules: the first one is attached on patient' smart phone. It continuously analyzes the data transferred from wireless sensors attached to patient' body. The data between the sensor and smart phone is to be transferred via wire or wireless communication using blue tooth technology. As soon as irregularities is detected by the application on the smart phone, it will alert server and provide the server with all available data including medical, personal and location data. The second module of the system is installed on the server which keeps, in its data

base, records for the different patients. This information ranges from patient personal and medical information until information about the physician in charge with the patient. The server based on the analysis of the received data, it has to alert ambulance to rescue the patient and also to send a brief report to his physician. Server to do so, it keeps tracking for all the ambulance vehicles patrolling the area of its coverage. When alert from a patient is received, it will direct the nearest ambulance vehicle to the patient. The third module, is installed on a special device in the ambulance, it has a function of announcing its location to server in order to let server updated with the ambulance current location. The other task of this module is to help visually navigation toward the patients based on the GPS technology and Google maps. When the physician receive the brief report about the patient status he will either decide to be in the reception of his patient or to give the directions to the person acting on his behalf at the hospital.

The communication between the patient and server or server and ambulance both will take place using either through GSM Modem over the GSM network, or through Wi-Fi network depending on which one will be available. The communication between the servers (represents the remote monitoring center) and physician will take place using SMS.

All the above scenarios might take place without the patient notice! The system is designed to be flexible and configurable to fit all uses by only change the configuration and keep the rest of the system untouched.





NBDG: National Blood Donation Gate

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ABSTRACT

National Blood Donation Gate (NBDG) is a web-based application that assists in managing donation process. NBDG will keep donors information in central database that will be accessed by all blood banks to ease the communication with donors, provides lists to keep the relatives and friends information to contact them when there is a compensatory need, communicates with donor through SMS or e-mail, tracks the number of donation for each donor to manage the granting of honor medals. It can be accessed as an e-service through the Ministry of Health (MoH) Portal.

NBDG goal is to use technology in order to automate and organize the donation process and the medal granting process in KSA. Our objectives are to utilize the technical tools to improve donation process in order to simplify, secure and document all related donors information, increase the effectiveness and accuracy of medal granting, encourage donation by reminding voluntary donors about donation and ease the communication between the blood bank employees and donors.

NBDG's architectural design is based on layered architecture that focuses on the grouping of related functionality within a system into distinct layers that are stacked vertically. Functionality within each layer is related by a common role or responsibility. Communication between layers is explicit and loosely coupled. Layering the system helps to support a strong separation of concerns that, in turn, supports flexibility and maintainability. The system is designed to accept future expansion plans and integration with current Blood Banks and MoH internal systems. Figure1 shows the proposed architectural design for NBDG.

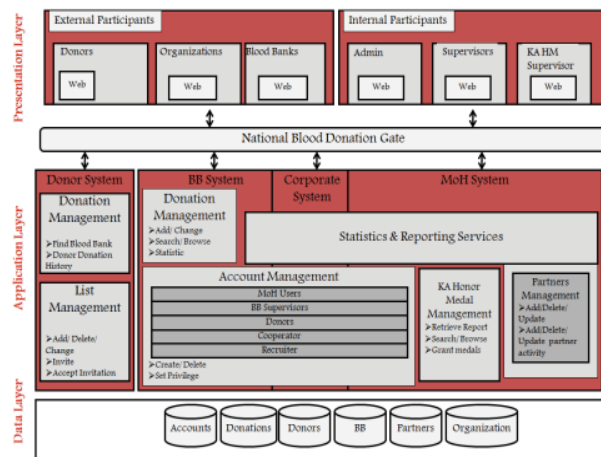


Figure 1 Architectural Design

Although e-Health has been around for many years, it can be called a relatively new concept, most Saudi health systems are still paper-based, and those that are electronic have poor capability to share their information. Hence, communication with the wider health information environment is severely limited, which fragments information and results in duplication of procedures and data entry which considered as major problem in the process of granting honor medal for blood donation process. The lack of integrating donors' information also has a negative impact on their health and lives as they may donate many times during non-permitted periods. NBDG's mission is to advance the quality and efficiency of the granting, and blood donation encouragements process through improved supporting of managing donors' donation information and providing centralized storage property.



Smart Home Automation Control

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Supervised BY:
Dr. Mohammed Khamis

ABSTRACT

Did you ever want to make your lifestyle easier than what it is now? Would you like to control your house remotely? What if you are going far away from your home and suddenly realize that you have forgotten turning off the A/C or lights? Want to save time rather than going back home and turning appliances off manually? Is it possible in our reality? The answer is yes, smart home is what you seek.

Smart home is a technology of home environment that will appear and spreads in every house in the near future. It connects the electric devices in your house and controls it by your smart phones while you are outside your home or inside it.

There are already some existing solutions, one of them you can control each device independently via separate remote controller for each device which is difficult to control. Another solution is pre-build smart home systems but it is very expensive and cost more than 5000\$.

What we will provide in this system is to control the lights, air-conditioner, and coffee maker, irrigator of the garden, diffusing of the perfume, and security cameras via your mobile. In the aspect of security, this system will provide controllability. We have pre-configured motion detection device that does the job of sending SMS to your mobile and then cameras start recording, so you can leave your house without concern.

Also we provided the System with new feature called "Home Modes". This feature helps the family to customize and save their home Appliances settings. For example outside mode, this turns off all devices inside the home. Another example is morning mode that turns on the light and starts the coffee maker, and so on.

With this system, will give old people especially who with special needs such as who can't walk the ability to control their devices via one device remotely.

The methodology of our project is to connect all devices to a relay board then connect it to home network via router then with our software we can control a specific device by turning it ON/OFF any time.

At the end of this project, there will be an android software sending commands to a particular device at home. This software has a database of multiple users using this system. The database records each user's commands at which time and date he triggers these commands (log information). Also, this android software will receive an SMS alert to user's phone from alarm sensor and handle this message by turn on the camera that is inside home.

How does this System work? We bring all cables of electronic devices like for example lamb, AC. we connect it into our center point system which is the Relay Board. This device is connected to a router by network cable and it has many slots that we can plug in the cables of our devices. Then we will program our application which is available in two different platforms, one for PC that supports Windows operating system, and another for Phone application that supports the android operating system. Now we can access and control the electric devices that are connected into Relay Board.



E-learning System for Languages Using Virtual World

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ABSTRACT

E-learning System for Languages Using Virtual World is a web-based system that can be used for educational activities by integrating virtual world with management system. The aim of this project is to make e-learning for English Language better than the real life learning and to make it better than the current e-learning, because current solutions include virtual world such as www.secondlife.com or web application (management system) to manage quizzes, courses, video conference, classes and pronounce dictionary such as www.Englishtown.com, Our system will integrate virtual world with web application to get better result.

Virtual World (VW) will allow students and teachers to represent by avatars, which can interact with each other. We suggest that the virtual world should simulate all objects and things that are required to deliver lecture which means every lesson has its own virtual environment for example, if there is a lesson about "cultures and custom", the virtual world should have an environment that has all the objects in order to reflect different cultures and custom.

For Virtual Worlds and Language Learning, Vickers (2009) suggests that because a virtual world naturally allows for situated, or "just in time" learning, it allows for "language emergence", where "students create their opportunities for language use and language learning" [1]. Research is now being done which specifically looks at teaching and learning languages in VWs through virtual instruction [1].

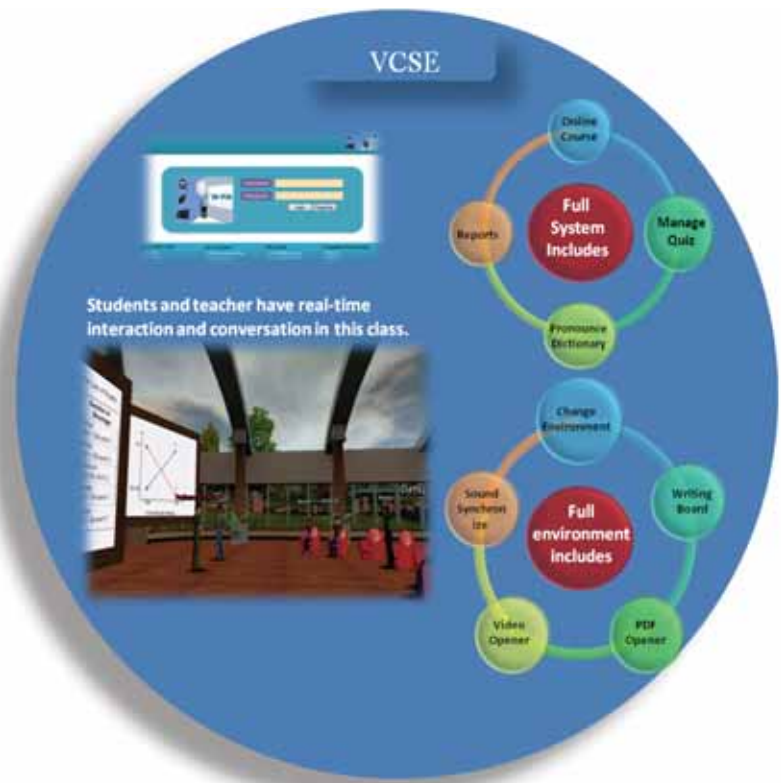
In our literature review of the virtual world, we found three main virtual word platforms which are 1- *Second Life* (as client) and *OpenSimulator* (as server) 2- *openwonderland* (as client and server) 3- *Croquet Project* (as client and server).

In First part of our system (VW), we found that the *openwonderland* virtual world platform is more suitable. For Web application or management system, which has three users i.e. admin, teacher and student. The admin user has authority to insert the levels' courses and open new section then assign teachers available and courses to that section. For the student user, we provide a pronouns dictionary, course (vocabulary, reading, grammar and writing) that entered by the admin, and the page of launching virtual world with the time of the lecture. From the teacher perspective, she/he will get one or more sections, the system will allow teacher to give quizzes, assignments, and Evaluating.

We know how much English Language is important and we know that the e-learning is increasingly used so, we need to do more and more to make it easier to learn and our quest will not stop. In next version (VCSE version. 2.0) of our system, we will integrate many new technologies and will work with feedback to improve e-learning for English Language.

References:

[1]The AVALON Project and Second Life – The analysis and selection of a virtual world for language learning and teaching 2011 by Joe Pereira.





IP Multimedia Subsystem for Mass Examination System: A Case Study

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Supervised by:
Dr. M. Rizwan Jameel Qureshi

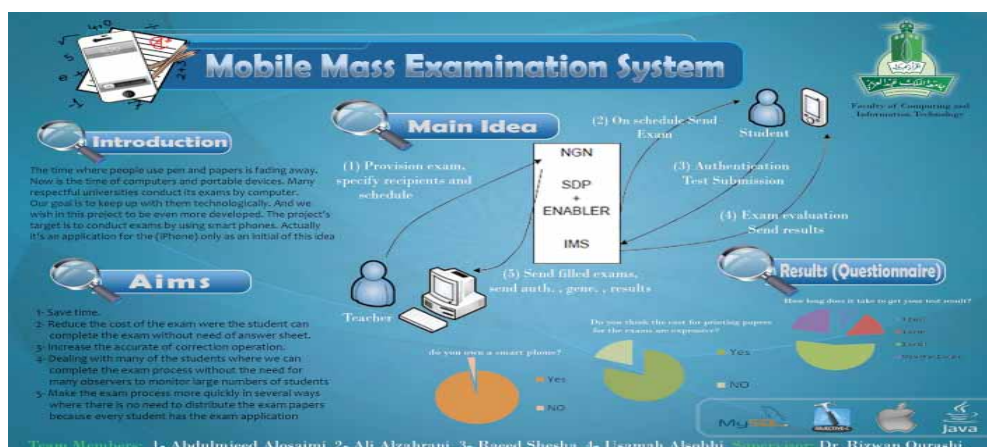
ABSTRACT

The time, where people use pen, and papers, is fading away. It is an era of computers and portable devices. The main idea of our project is to facilitate the examination procedures easier, quicker and enjoyable. One of the main objectives, of our project, is to conduct exams by using smart phones. Many instructors faced problems to deal with huge number of students such as choosing the suitable place, distributing and collecting exam papers, monitoring and correcting exams papers. The benefit of this project is to save time, cost reduction, decrease effort and increase the accurate of correction operations. The mobile technology is playing a dominant role now in the academic life as one of the state of art technologies.

In this project we aim to:

- ✓ Deal with large number of students, where we can complete the exam process without the need for many invigilators to monitor large numbers of students.
- ✓ Reduce the cost of the exam.
- ✓ Save time for exam preparation, marking and result submission
- ✓ Enable student to get his result anytime from any place.
- ✓ Student can revise his paper and check all mistakes in his exam paper.

A case study is used as a research methodology to validate our research. iPhone based environment is used to develop Mass Examination System. iPhone, IMS servers and Computers were the main resources to conduct a case study. Student entered his ID and password and the application checked student authentication for the exam. The application received the questions to answer and submit them. The exam is sent to the IMS server for the evaluating purpose. The marks and mistakes are shown to student on his mobile device. IMS server manages the exam data, instructor data and session management. This research developed IMS-based mobile examination system for the students and faculties of King Abdulaziz University, to save time and cost as well as effort reduction.



Official Project Poster



Smart Travel Planner

Amal Saad Alkhunji, Ghada Khaled Alhader, Hanan Rabeiah Alrabeiah,
Noura Abdullah Alhammad, Sara Khader Alzahrani.

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ABSTRACT

The increasing trend towards globalization is motivating more and more people to travel and inspiring them to visit multiple places in each trip. Consequently, organizing one's journey has become a considerably complex and time-consuming process requiring one to choose among several transportation options, places to visit and hotels to stay in. Furthermore, one has to factor in meal breaks and calculate routes with the least travel durations in order to make the most efficient use of the limited time available.

In order to facilitate this process, we have developed the Smart Travel Planner, a web-based intelligent system that provides the following functionalities:

- Allows the user to register and enter his preferences (food, activities, etc.).
- Allows the user to create an itinerary and add city plans to it. For each city plan, the user specifies the name of the city and the arrival and departure dates and times. Various locations can then be added to the city plan where the date and time for visiting each location is explicated.
- Allows the user to block certain times.
- Calculates the best route for visiting all the places specified by the user. There are two options available: The first option allows the user to simply specify the places that he wants to visit and the amount of time that he wants to spend at each place; the system then calculates the shortest route for visiting those places. The second option allows the user not only to specify the places that he wants to visit but also the exact time at which he wants to arrive at each place. The system then calculates the best route among those places and informs the user at which time he needs to leave each place in order to arrive at the next place at the specified time.
- Detects and resolves scheduling conflicts.
- Displays suggestions for hotels, restaurants, attractions and meeting locations based on user preferences and allows these to be added to an itinerary.

The system is a mashup of the following APIs: Google Maps, Google Places, Expedia and Wikipedia. SOAP web services and javascript have been utilized to retrieve data from the Expedia API and the other APIs respectively. Route calculation is based on Dijkstra's algorithm.

Unlike other similar applications which essentially work as calendaring programs, our system is unique in that it integrates the information and functions needed for travel planning within a single application and provides additional functionality by taking into account the users' preferences, blocked times and conflict resolution. Moreover, the route calculating function is singular in its ability to provide users with not just the shortest route but customized suggestions based on their time specifications. Also, this system is not limited to a specific geographical domain but includes all cities around the world supported by Google Maps and other services included in the mashup.

We plan to extend our system by providing an Arabic language interface and the capability to reserve hotel rooms, and intend to develop this into a mobile application.



ETLC: Efficient Traffic Light Control using RFID

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Supervised by:

Dr. Mohamed Ashraf Madkour ,& Eng.Fazal Qudus Khan
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ABSTRACT

Nowadays, time plays the most important role in life. So, it will be a problem if we lose it periodically. From this point our idea is originated. Loss of time mostly occurs in traffic intersections as shown in Fig. 2. This thing may disturb normal people and sometime may become life threatening, e.g. the emergency vehicles (fire brigade and ambulances) passing by may stuck there for hours.

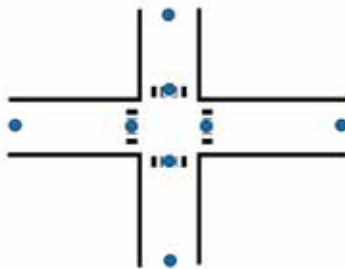


Fig. 1. Placement of the RFID readers in a typical cross road intersection



Fig. 2 – Cars waiting in a crowded traffic signal.

Also there are cases of car theft and kidnapping, all these things can make serious problems for governments to drain their energy and waste it, which makes most of its work focus on crimes thus disturbing or slowing down other developmental activities.

Our system addresses the problem mentioned above to save the time, tracing and detecting stolen cars. Our system will integrate different IT technologies i.e RFID and Databases to solve these problems. On a typical corss road intersection, there are four directions. At each direction we will put two"2" RFID readers (one is under traffic light and the other one is before) as shown in Fig. 1. There is an RFID tag attached to each car so that the reader can read the car's identification, when it passes below the reader.

The system will handle three different situations as follows:

- First case: public cars.
While the traffic light is red, the first reader (R1) in every duration will read the tags and send to the system to store in the database. The system will count the number of cars and give suitable time. When the traffic light is green, cars will go through the intersection and the second reader (R2) will decrement the stored count. The system will store the instantaneous number of cars in every branch and will be able to adjust the timing for opening and closing each branch to get best performance.
- Second case: Emergency services
When the system detects the emergency car through matching tag with Emergency tags database, it will give it a priority to pass the intersection.
- Third case: trace and detect stolen cars
The system will detect stolen vehicles through matching the tag, with tags in the database. Then it will send attention signal to the traffic and police department to facilitate the search process.

At the end of this project, we hope our system will contribute to serve the nation and its citizens.



Energy Consumption Monitor and Control Mobile Application

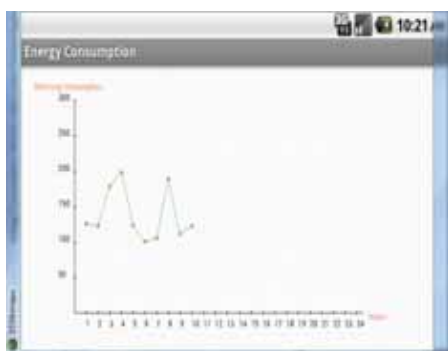
Mashaiei Alqulaq, Heba Alshobaki, Elham Alkabawi, Rasha Bamatraf, Alshaima Fayad, Abeer Alqahtani

Supervised by:
Dr. Maysoon Abulkhair
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ABSTRACT

Earth is our planet and we should keep an eye for it. Through ages human has made series of evolutions to make life easier on earth. Human used the power of nature and his/her mind to create new inventions and technologies such as electricity, transportations, and factories to fulfill his/her needs. But on other side it has caused a bad affect on the environment causing Global warming, ozone hole etc. Solutions were made to limit the damages and protect the environment and we wanted to participate in this protection by providing a mobile application that focus on the electricity problems. Using electricity itself doesn't affect the environment but it's the way that electricity producer companies produce it since they use burning fossil fuels (coal, natural gas, oil) which produces a lot of bad chemical gases that hurt our environment and causes problems such as air pollution, ozone hole etc. We decided to build an application that allows people to monitor their electrical energy consumption at their houses constantly from any place far from houses to stay always aware of their consumption and reduce it by limiting the use of electricity resources to only needed ones so the electricity producer companies reduce their production and the released gases of this operation will be reduced as their effect. Since the revolution of the smart phones, there's no way better than using this technology to implement such an idea since everyone is closely attached to his/her mobile and obsessed using it frequently in every small part of his/her life. We decided to develop a mobile application that allows people to monitor their consumption and reduce it by controlling some electricity resources remotely through their mobiles. Also, we provided them small social network to share their energy consumption reduction tips and compare their uses. There were some applications that help people monitoring their consumption but we have combined three features (remote monitoring, remote controlling, social networking) that mostly attracts people using our application.

There will be an energy meter installed on the electrical box and Arduino microprocessor installed on the switches of the user house and connected to server to send measurements and commands then the server will be accessed by the users to get two types of graphs showing his/her consumption. First, daily consumption graph changes every day showing 24 hours of consumption of current day on x-axis and consumption on y-axis. Second, monthly consumption shows every day of current month with its consumption. Obviously, Users can monitor consumption frequently and easily and based on graphs can either turn on/off the lights of the house from one click from the mobile by the Arduino. The users also can share consumption reduction tips and compare their measurements graphs with others on social network. The application will warn the user if he/she exceeded a limit of consumption and ask him to minimize it.



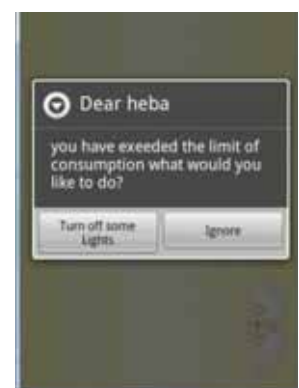
Monitor consumption



Control consumption



Social networking



Consumption warning



TrieAMDT: An Apriori Motif Discovery Tool

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ABSTRACT

Motif discovery is the problem of finding recurring patterns in biological sequences. Finding such patterns, also called motifs, gives an indication of important functional roles for our body which is also our DNA sequence. This is one of the most interesting and long-standing problems in Bioinformatics. Data mining plays an important role in discovering frequently occurring patterns in sequences, which motivates its application to solve the motif discovery problem. Over the past few years hundreds of algorithm has been developed to solve the motif discovery problem. A newly invented technique was published this year, the TrieAMD approach. It is inspired by the classic Apriori algorithm, a well-known algorithm in data mining that can discover frequent patterns in large datasets. Motifs can be sequential or structural. In structural data, a structural motif is a super-secondary structure that is the general three-dimensional form of local segments of biopolymers such as proteins and nucleic acids (DNA/RNA). However, in sequential data these data include DNA sequences, protein sequences, and real-valued sequential data such as protein structures and time series of arbitrary dimension. As more genomes are sequenced and annotated, the need for automated computational methods for analyzing biological data is increasing rapidly that's why TrieAMDT will focus on sequential motif discovery.

Table-1 shows many available tools for motif localization and discovery approaches. Some tools, such as Mast is designed to find a given motif in a given sequence. Other tools, such as GLAM2 and DREME are designed to discover a motif in a given sequence, each of them is applying a different approach, and some tools can handle both motif localization and discovery, such as BLAST.

The TrieAMDT is a pattern discovery web-based application with a user-friendly interface, the user can upload input sequences in different ways. He can write sequence directly in a text box or upload his own files, then; the user will gain access to GenBank files through the system repository database that will be updated by the system admin periodically. The system supports different input formats (e.g., FASTA). The tool uses the TrieAMD approach in order to discover frequent patterns, motifs, in the input sequences. Discovered motifs are represented in a graphical format for easier visualization of the results. The tool gives the user the flexibility to store and print the discovered motifs along with some statistical results. In addition, it gives the user the flexibility to send the results as a report by e-mail so that he doesn't have to wait for the results. The tool allows the user to adjust system parameters (e.g., minimum support, error rate, and maximum widow size for the discovered motifs). Finally, the system administrator is able to update the database repository and to update user information and keep track of log files. The TrieAMDT tool can be compared to other available tools with respect to input, output, and tool type, according to the following table.

Table1: a comparison between similar tools

	input		DB access	output					Tool type	
	Text sequence	FASTA File	Data repository	Graphical	Free text	Statistical	Email	Pattern match	Pattern discovery	
BLAST	*	*		*	*			*	*	
DREME	*	*			*		*		*	
GLAM2	*	*			*		*		*	
MAST		*			*		*	*		
TrieAMDT	*	*	*	*	*	*	*	*	*	*

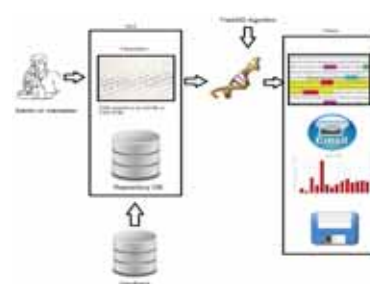


Figure1: TrieAMD overview and interface



Two Dimensional Motion Analysis For Sport Applications

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ABSTRACT

Motion analysis is a topic in mechanics intended to find the kinematic and kinetics of movement using video recording and image processing techniques. Motion analysis is very essential in sport activities to enhance the performance of an athlete and to ensure the correctness of regimes. Many motion analysis systems are in use currently all over the world such as videotaping, electromyography telemetry and optical detection of active or passive markers. These systems are expensive and only available at special laboratories in research centres. The aim of the current project was to develop a two dimensional motion analysis system that are cheap and available to all researchers who are interested in motion analysis for sport application.

In the current research a webcam was used to record a video of a person doing certain sport movement. The frames of the recorded video was extracted. The joint in interest was tracked for each frame using the mouse cursor to find the trajectories of all joints. Finally, the kinematic data were calculated from the hip joints trajectories by performing numerical differentiation methods. Forward, backward, and central difference methods were used to do so. Figure 1 below shows the stages of processing.

The proposed Motion analysis system provide an easy to excess, cheep, and available tool which can be used in the analysis of many sports movements such as swimming, jumping,...ext. This system can be improved to include the three dimensional data.

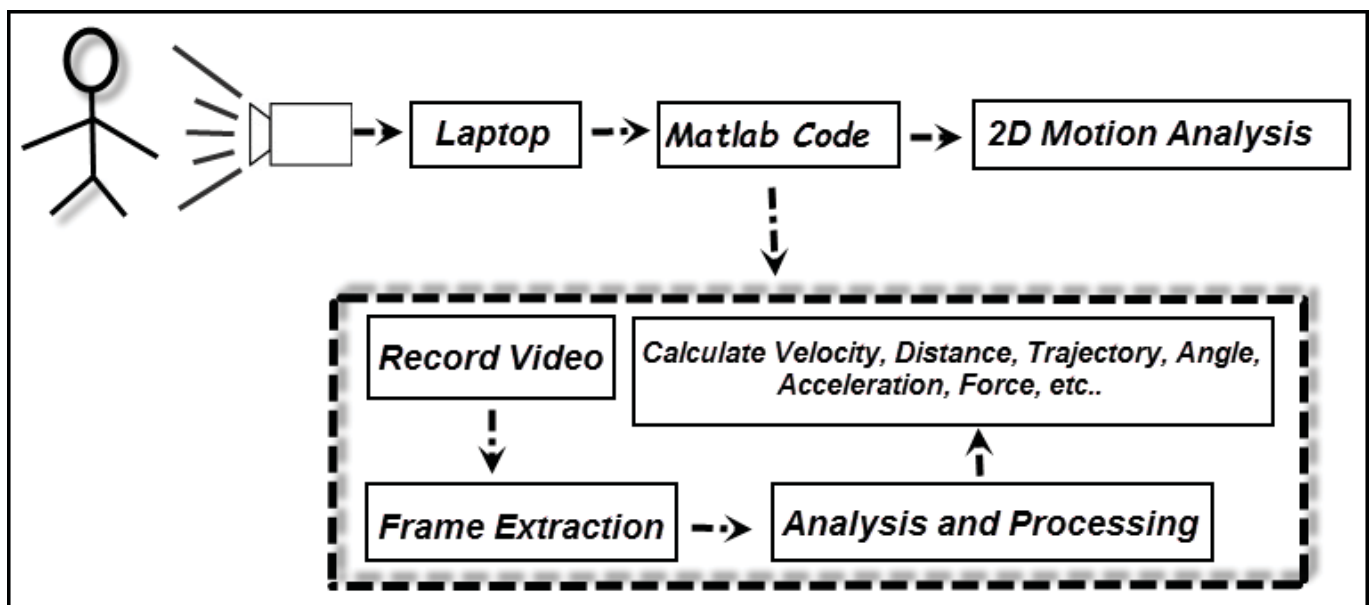


Figure1. Block diagram showing the stages to get full motion analysis



Simply learn: Simulation of Blackboard

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ABSTRACT

Simply learn is a web-enabled learning management system that enables drastic improvement in education communication. It offers a tremendous yet easy help for students, faculties, and educational organizations to fulfill the day-to-day educational activities. It facilitates communication between students and their teachers. It allows students to search and find their lecture materials, assignments and grades in simple and fast manner, it also gives the ability to teacher to grade and upload all needed materials for any course. Each student and instructor use a unique authentication scheme which is usually the student or faculty ID number and password to login. The main goal of this project is to design and implement a simulation of blackboard system for elementary, middle, and high schools since it is not available yet in Saudi Arabia. Use of technology is recently adopted in Saudi schools, therefore, working on this project give great help for educators and students to improve communications and facilitate the cycle of education and enrich students and teachers sociality especially out of school time.

At the outset, the project report covers the improvement in the teaching techniques and how it has been changing and enhancing until the advents of the blackboard systems. The report describes the uniqueness of this systems in terms of simplicity and agility that suites students ages at elementary, middle, and high schools.



Figure1 scenario of the exam function

Each student registers in one class only and then adds the course subjects. Instead of using hard copy textbooks, this system offers e-books for students. They can also look for external resources that help in investigating and writing research for a particular topic self-learning. Assignments are uploaded by instructor and can be submitted online by students. Students can also create groups (discussion groups) within the course and can discuss a specific project they are working on or any task related to their courses.

At the instructors angle, since they will use smart board at school, writing on chalkboard will be replaced by electronic presentation to present the lessons. These presentations can be uploaded by instructors to the system, so students can download them and use them as helpful material for studying. Assignments can also be uploaded to the assignment section in the system, and then instructor post an announcement about due date. Announcements can also be used to notify students about other important things such as classroom location, time changes, or grades. Instructor can also choose whether to use old style for writing exams using papers, or to write an exam in the system and determine a specific time to commence the exam, at that particular time, the form will be visible for students. An external resources section will contain multimedia files which can help students to enjoy learning and might find it easier and better to use multimedia means. The prime focus of our project is usability, agility and students outreach.



Smart Traffic System Using RFID

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ABSTRACT

The statistical report published in Alsharq newspaper by general manager of Ministry of transport in 2011, reveals that the death rate per day is 20. Although the Highways of Saudi Arabia as compared to the rest of the world has maintained high standards since long but there has been significant increase in the accident rates as days pass by. The reasons for this increase in accidents rate is because of growing population and growing demands for vehicles in the kingdom. The other main reasons according to the public opinion (Data gathered through our questionnaire) reveal that the Ministry of transport has not taken proper technological measures to tackle this huge issue.

Our system will focus on three major traffic problems which are **over speeding, vehicle theft and check point mentoring**. The current technical solution to these problems are not sufficient because in the speed control system the traffic agency use LIDAR technology that use a laser to measures the speed of the vehicles. The devices planted in different points of the road to monitor and capture pictures to these over speed vehicles but the problem is that the monitoring of these is just a fixed point of the road and after these points the road is not monitored the other disadvantages is that all the pictures get process manually. The current manual system need to be automated for vehicle theft and check point. In the check point the officer need to check all the vehicles manually and in the vehicle theft the police will inform all the police on patrols of the stolen vehicle and wait for replay.

STS integrates hardware (RFID) and software (windows application) to solve and enhance the traffic agency performance. In the implementation phase we build our system using high level programming language C# and SQLserver for the database connection where the vehicles and owners information will be registered.

Our system will find a smart way to enhance these functions and make it more effective and efficient in terms of performance, security and automation. In the over speeding issue all the vehicles will be tagged. The RFID readers in the highway will record the tagID and the time when any vehicle pass these readers.

By calculating the time that the vehicle took between readers and compare it with the normal time (if the vehicle was in normal speed) we can find out if the vehicle was over speeding or not. Our system will provide an automated alert system if any wanted vehicle passes any reader the system will check in the wanted table in if it exists it will generate alert message to the police department. The last function of our system is to enhance the process in the check point by install the RFID reader in the check point and when a vehicle reach the point the vehicle information will appear in the officer screen and it notify the officer if this vehicle is wanted or has any violation.

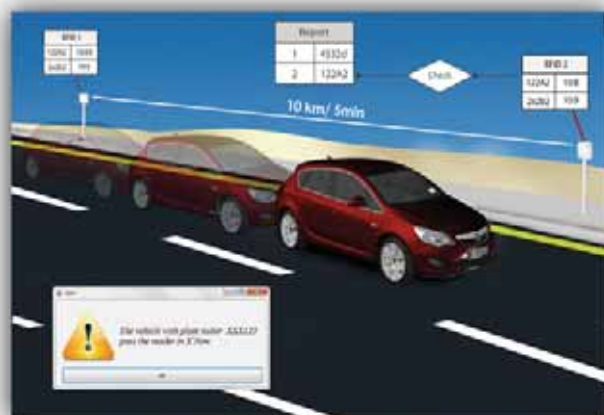


Fig 1. RFID sensors in action



Electrogoniometer

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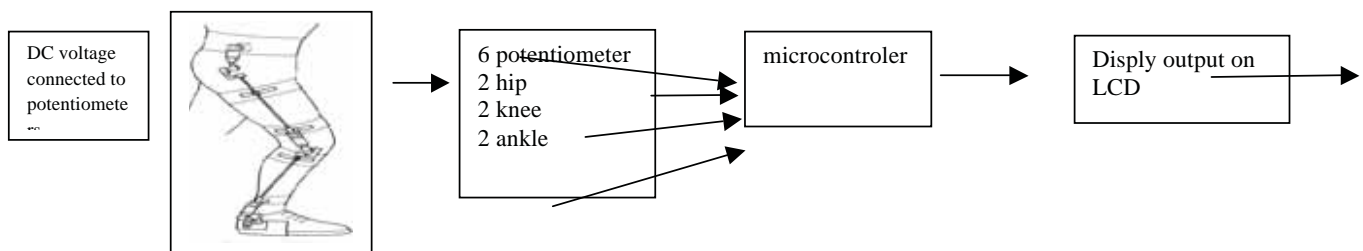
ABSTRACT

Gait analysis is a method used to assess the way we walk to highlight biomechanical abnormalities, gait analysis is usually performed by a professional, such as a podiatrist or physiotherapist, although it is now becoming more widespread and readily available with many specialist running and sports shops now gaining the equipment and staff who are trained in gait analysis, Clinical research has identified clear links between human gait characteristics and different medical conditions .

There are many gait analysis methods such as video analysis, Electrogoniometer, and optoelectronic systems. Electogoniometer is a piece of equipment used to measure a joint angle during dynamic movement. In some cases, it will only measure in one plane of motion, e.g. Flexion/extension of the knee. However, some may measure a certain movement in different planes simultaneously, such as plantarflexion/ dorsiflexion (pointing the toes down then up again), as well as abduction/adduction of the ankle (side to side movement).

The current electrogoniometer is nothing more than a variable resistor(potentiometer) that is sensitive to changes in angular position. Two arms, one fixed to the outer casing of the potentiometer and the other to the rotating shaft, can be used to mount the device to the segments on either side of a joint. The potentiometer is placed over the joint axis of rotation with the arms secured to the segments by medical tape or elasticized wraps. Changes in joint angle will cause the *wiper* (i.e., sliding contact) of the potentiometer to slide across the resistor, resulting in an output voltage linearly related to the joint angle. six-potentiometers were used to measure the sagittal and frontal plane movement of the hip,knee,and ankle joints.The ouput voltages from the six-potentiometer were to microcontoler to calculate the angles and display it on the LCD.

The methodology and techniques described in this project, is possible to implement precise, low-cost angle measurement systems, which that the electrogoniometer is very useful for measuring, monitoring and recording patient performance and treatment results.



Fig(1).block diagram for electrogoniometer



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ABSTRACT

Lifting weights have so many problems and causes a lot of injuries especially for the newbies. The problems start with the lack of personal trainers at the gym in addition to lack of experience and with heavy weight the person may lift in wrong position, which will lead to an injury. The user doesn't know how to proceed in the gym or what will nutrition plan look like. Therefore, by this android application, the user will have nutrition plan and he will get the right help to fix his positions plus the right exercises for his level.

The application is divided into three parts. The first part will take care of the exercise, as there will be photos to describe exercise. Each exercise will have 2 photos one for the starting position and the other for the end position. Under the photo there will be a total description for the whole exercise then he will find a video of a professional bodybuilder doing the exercise so he can get the full idea of the exercise. Also he will find the right exercises for every day along with his journey.

The second part will be the nutrition as I said before in order to get the maximum benefit of the workout you need a good nutrition. The applications will provide the user with a healthy and safe nutrition so he can gain the right amount of protein with energy to continue his day. The nutrition plan will be connected to the plan of the workout as every workout will have its own nutrition plan for example if someone is trying to lose weight he will get a low carbs nutrition. This nutrition program will follow the person day by day along with the workout.

The third part is about enhancing the workout for the user, basically I will use the accelerometer sensor then I will use the vibration in the device and the last step is implementing these two functions through every workout that needs adjustment or can cause injury. The accelerometer will measure x, y and z. x and y will be the angles I will use but z is the gravity so I will just neglect it. The key is to implement x and y so if the accelerometer reached a specific angle the vibrator will vibrate through the pattern I will specify. By using this method the user will know if he is in the wrong form or he is lifting the weights in the wrong angle.



Active Citizenship System Using Smartphone

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ABSTRACT

In any city in the world citizens suffer from a lot of different problems (Social, economical, energy, poverty and security etc.), which differs from place to another. Responsible entities / authorities like municipalities cannot cover every inch in the city to discover and solve these problems. We know that civil rights enable every citizen to be a police officer without a uniform. A lot of those citizens have been through a damaged street or pipe leakage etc. that they want to report about but they do not know to whom? Where? And how? Some of the citizens do not know who is responsible for the issue, while some might have a bad experience in calling the entity such as waiting a long time before he is answered telling himself that the others will report about the required issue. Sometimes they are acclimated to it, which is even worse.

On the other hand, we have such citizens who want to report about the problems. They have a smartphone or more and it is provided with a good camera, GPS capability and Internet access. The question we ask ourselves is that can we use this obtainable technology to bridge the gap between those who can report and those who blame technology to be immature towards reporting about?

The answer is yes; we can develop a mobile application to connect citizens with responsible entities. The idea is very simple, whenever a citizen encounters a problem using the application he will take a photo, the GPS will coordinate the location and then send it to the entity via the Internet. So there is no more wasted time on the phone reporting about the problem and no more headache of the entity's phone calls. Even more, precise information will be taken and interpreted by an expert or specialized officer. An example of a car accident will illustrate this point, sometimes the reporting citizen underestimates the accident so when the officer reaches the scene and discovers the situation's need of more backup, this is a wasted time when we are in bad need of every second to save people's lives. The reporter might overestimate the situation resulting in wasting the authorities time and efforts. Through the application, the specialized officer will analyze the image and accordingly he will send the needed backup. In addition to that, people of special needs such as the deaf and speechless ones will feel comfortable when they report to the entities. It is so essential to use the two-sides existed facilities: citizens and responsible entities.

The process starts with the user by using the active citizenship application in his smartphone and the application will retrieve the current location by using GPS signals, this is depicted clearly in figure 1. The user will provide the kind of the problem with its related photo. After that, it will transfer the report to the server, while the entity will receive the report to access it by using a website. The citizen will be answered when the problem is entirely solved. Also the admin will be in middle to make sure that everything is right.

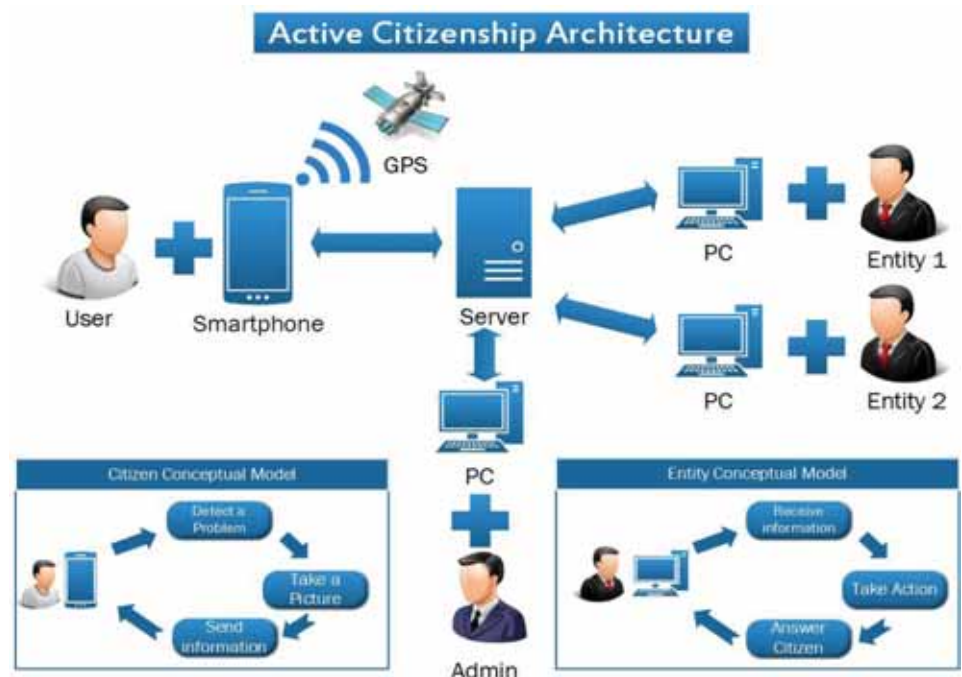


Figure 1. System Architectural Diagram



Hamlati for Hajj Campaigns System (HHCS)

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ABSTRACT

The five pillars of Islam are the main structure of all Muslims' life. The annual pilgrimage to Makkah is an obligation to all those who are physically and financially able to perform it. Pilgrims must register within a campaign. A Hajj Campaign is like a travel agency. They provide transportation, food, lodging, and the permission for the Hajj period. Some problems face the pilgrims when searching for a campaign. For example, finding previous pilgrims' experiences', checking available slots, and finding suitable campaigns without wasting time and effort in reservation.

Hamlati for Hajj Campaigns System (HHCS) includes all the present hajj campaigns in Saudi Arabia in one website. This is done in order to help organize the campaigns and make it easier for the pilgrims to select a campaign without wasting time and effort. HHCS will offer many functions, such as: for the people who want to pick a campaign, the system will provide a search function where they can search for campaigns by name and location, then they can filter the results based on price, star rating, campaigns' type.

Each campaign will have its information and services displayed along with a gallery on each campaign's profile page. Pilgrims can also view other people's reviews and rates on a certain campaign. Reservation can be done electronically based on slot availability. Only when the user is satisfied with what he found, he can register in the website and complete the reservation within three days and pay with preferred method payments such as PayPal, credit card or by account. Users as well, can add a review after hajj has ended at a specific campaign. This is done by sending an email request to write a review about his experience, in order to improve their services. Visitors can vote for a review if it is useful or not. The featured reviews that were voted for as the most helpful, will appear at the top of the page. People who want to volunteer in campaigns can view the vacant jobs and submit an application.

Administrative functions are for the administrator and the campaign owner. Administrator is in charge of: adding, deleting and updating campaigns, creating campaign owner account, checking the payment status, and viewing notifications that appear on the dashboard. After creating a campaign account, the campaign owner contacts the administrator to send direct messages within the system to update the campaign information and offer volunteer jobs. In addition to viewing the information of all the pilgrims who already paid.

The technologies used to implement HHCS are: HTML5, PHP with SQL and XAMPP server, JAVASCRIPT, CSS3. This website will be accessed responsively from any browser using any device (smartphones, laptops and Tablets).

This project was undertaken to help provide more information for pilgrims to select the best campaign in an easy way and help spread community services through volunteers. By adding many functions to the project, the team will be applying most of what they learned at the university and achieve their main goal by helping their religion through aiding other Muslims.



IT Standard Security Policy

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ABSTRACT

Security policies are used to uncover the potential vulnerabilities and risks that may appear at a specific system or technology. A security policy will be implemented by a security compliance tool, and then operated on a target system to produce a report as a result for the operation. This report will then be analyzed to decide if the system's level of security is acceptable or not.

This paper proposes an approach to fill the lack of standard security policies. This lack of standard policies is a result of the current approach of building these policies. Current security policies are being established according to customer's guidelines, not to standard document guidelines. In other words, every corporation has its own security policy, which is written and stated to be then delivered to one of the security companies. These companies may first test the needed system, after that, a new policy will be built to fill the system gaps. This policy is not built using a benchmark (CIS Standard Document) as a reference.

We need to emphasize that the proposal aims to overcome the lack of implemented policies, not a lack of standard documents. Available standard documents will be used as a reference to aid the establishment of such policies.

Our approach to build standard policies requires the understanding of: security controls, CIS benchmarks, security checks and target systems. Security controls are written (not necessary implemented) concepts and terms of security that are linked to a specific system(OS, Application, etc.). These concepts are found at a system's standard document that is called a benchmark. Security checks are pieces of implementation that have the capability to test a specific service on the target system. The target system is the system to be used in order to provide its standard policy by collecting its controls and mapping them to available checks on a certain tool.

The proposed approach to reach comprehensive policies is designed to follow a special mapping technique. This technique aims to deploy the collection of security controls obtained from a CIS Benchmark, and the collection of security checks found at a specified security tool (our tool is QualysGuard). The challenge here is to establish the best links which bonds the needed control with the suitable check/s. This procedure includes a deep search for the meaning of each control.

We already started to implement the idea. The target system chose was Oracle 10g, and the tool is QualysGuard. We are researching what the suitable checks provided by QualysGuard to fulfill each control found at the Oracle 10g CIS Benchmark.

The research shows that there are three possibilities for each control to be matched. First, a suitable check/s is found to fulfill the control. This case can be referred to as the direct one. Second, more than one check and deep investigation is needed to fulfill the control. This case can be referred to as the indirect one. Third, no checks are found to fulfill the control. This case can be referred to as a gap.



Smart Speaker: An Arabic Augmentative and Alternative Communication System for Adults with Speech Impairments and Normal Cognitive Abilities

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ABSTRACT

Smart Speaker is an Arabic intelligent speech-synthesized hand-held Augmentative and Alternative Communication (AAC) application for Apple's iPad and iOS platform. It helps Arabic native speakers who have speech impairment with normal cognitive abilities in their functional speaking needs by converting their Arabic typed texts to voice.

The main objective of *Smart Speaker* is to model the human performance in speech learning and generation, increase the speed of keystroke, and decrease the effort needed in typing, as an attempt to emulate the speed of oral speech. Furthermore, *Smart speaker* avoids the requirement for a special AAC device and allows direct download of application from App stores with low cost.

Smart Speaker is classified as an intelligent application since it predicts typed words and sentences based on the user's previous behavior, adapts its prediction to the user's different locations, and automatically complete user words and phrases. The auto-completion of phrases is achieved using a tree structure to store the sequence of words constructing a phrase. The system allows multiple suggestions of phrases ranked in most likely to least. Two criteria are used in identifying the rank of a suggestion; recency and frequency of used phrase.

Smart Speaker introduces other techniques as well to increase the speed of keystroke in order to emulate the speed of oral speech. These techniques are: a short-cut option, listing recently used messages and categorizing phrases. The experiment results show a 100% precision of suggested phrases and average of 0.53% precision of ranking system. This indicates that the role of intelligence components in AAC should not be underestimated.

We can classify *Smart Speaker* in terms of its features and functionalities; mainly the application serves Arabic users with normal cognitive abilities who have any kind of speech impairment. It generates speech outputs with synthesized speech.

The intelligent features include: (1) The ability to store the user's previous behavior, represented by the common words/phrases used, and their use in user locations. The stored user behavior is used to predict the user's speech patterns. (2) The ability to adapt itself to the user's changing environment, based on the factors that influence message (location) and recommend phrase-auto-completion accordingly.

Lastly, for the customization features, users have the ability to customize the generated speech by controlling its speed and select its type (male/female). As well as, providing a shortcuts property for phrases and user preference. Also, users can customize the application graphical user interface by changing the background color or the text font size. In addition, users can customize the favorite words/phrases, which displayed in the home page for quick access. Users also can manage their messages by forming and storing their conversations for future retrieval. And for the privacy, users have the choice to set password on the application to prevent others who share the same iPad from accessing user's data.

"Figure1" shows the smart speaker home page, which has a simple, clear and user-friendly design.



Figure 1: Smart Speaker home page



A Comparative Study of Implementation Impacts of Dijkstra's Shortest Path Algorithm In Multilayer Networks

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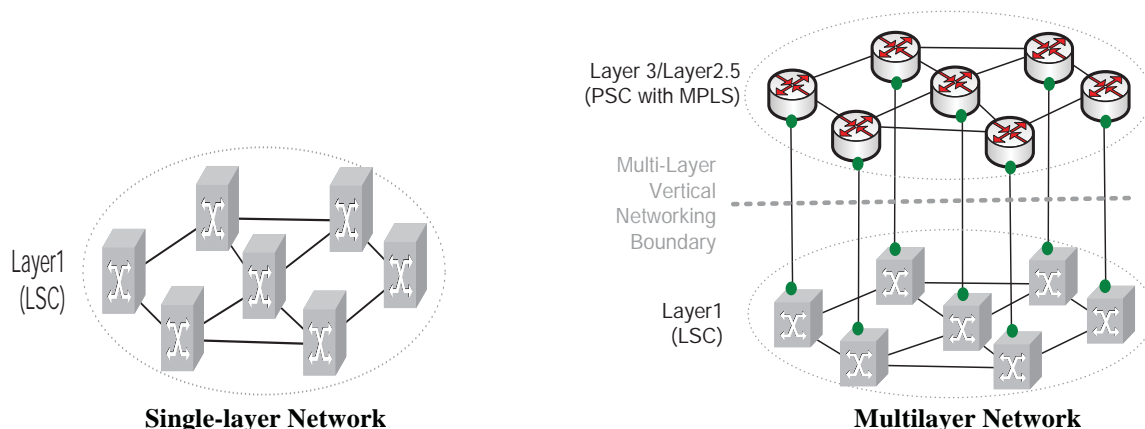
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ABSTRACT

Optimal network performance is a paramount issue in Computer Networks. It can be achieved by employing efficient algorithms in various network applications, layers, and protocols. One of the major problems in Computer Networks is the shortest path routing. In the traditional single layer networks, finding shortest paths is a well-studied problem. Dijkstra's algorithm is one of the most popular algorithms used for solving such problems. It calculates the shortest paths from one node (called the source node) to every other node in a given weighted graph. Although the performance of the algorithm can vary depending on the data structures used with it, the results tend to stay largely consistent. However, the case for *multilayer* networks is not quite as simple, due to the fact that optimal path selection problem in *multilayer* networks is not thoroughly studied as in single layer networks.

In this project, we investigate the performance of Dijkstra's shortest path algorithm on *multilayer* network architectures. The project is divided into two core phases: development and evaluation. The development phase is concerned with building a tool that will be used to show how Dijkstra's algorithm works in *multilayer* networks. Then, in the evaluation phase, we will implement Dijkstra's algorithm using two different data structures and compare the impact of the implementation on the network performance. These data structures are the popular binary heap and the more sophisticated Fibonacci heap. A central goal of this project, therefore, is to extend the process to multilayer architectures and observe the impact of the implemented data structure on the network performance.



The structural difference between single-layer and multilayer networks

Keywords:

dijkstra
multilayer
networks
shortest-path



Electronic House Security System Using Smartphone Application

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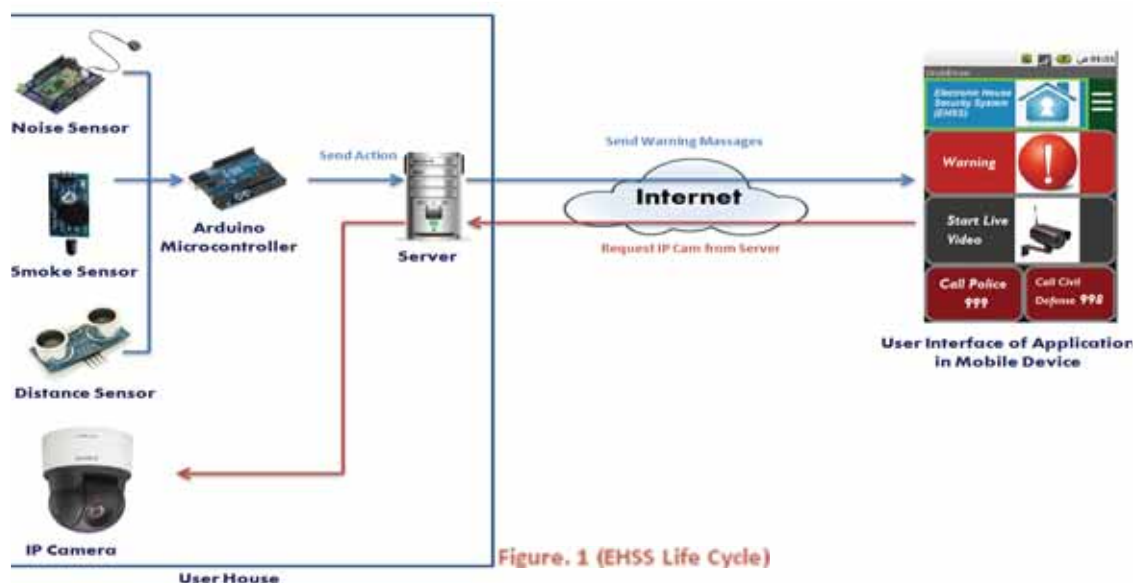
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ABSTRACT

Security of life and property has been a great concern to people all over the world. Different approaches and devices have been put in place to ensure a high level of security with regard to life and property. Governmental bodies have also put different forces in place to reduce the rate of crime in our society. While deciding about the major project, the main consideration was to make something that would be practically useful and could be utilized in our daily lives as well as various diverse fields. In the kingdom of Saudi Arabia (KSA) in some houses, the houses maids are found to be making some troubles with home alone children while the parents of children are away from home. This is one of the considerations and motivation to do this project. Other security concerns are about fire accidents in home, theft crimes has increased a lot in today's world and not everyone can afford costly security system. So in Electronic House Security System (EHSS) we have tried to make it low cost and effective security system.

EHSS is about how to make the house more secure by using integrated Information Technology (IT) technologies for monitoring the situation in the house regarding security aspects like theft, fire and status of children left alone with house maids. This monitoring can be done remotely using smart phone by the house owner when he is away from home. In EHSS (As shown in the figure.1) monitoring is done by the use of smoke sensors for detecting fires, Distance sensors for the house front door, noise sensors for detecting children crying voices and IP camera. The sensors send signal during abnormal conditions, to the server which is placed in the house. The server will send the interpreted sensor data to the house owner through SMS to the user mobile device. He can further analyze the situation at home by controlling the IP camera installed in the house through the application remotely. Through the smart phone application the house owner can call police or fire brigades with a button press. The system uses latest wireless communication technologies such as Bluetooth, Infrared and Wi-Fi.



Nowadays, the smart phones start to take over the technology users and the smart phone applications are used by many people. EHSS system is supported by the smart phone application. It is used to improve the usability of the system and it is the future technology.



A Smart Guidance System for the Blind

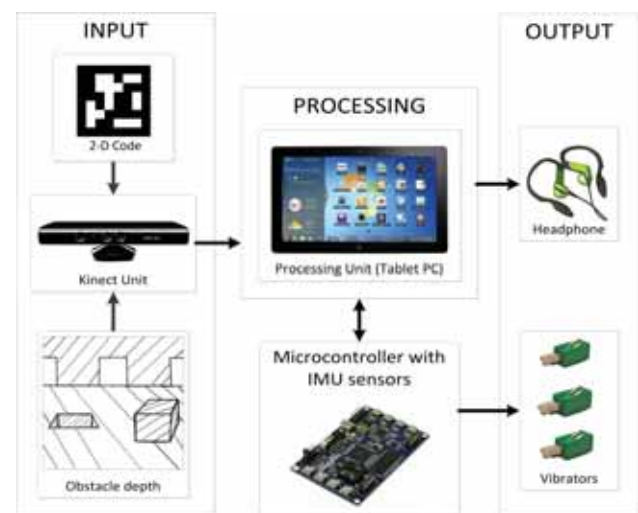
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Supervised by:
Prof. Mustahsan Mir

ABSTRACT

A portable and easy-to-use smart guidance system has been developed to guide the blind and visually impaired people in indoor environments to avoid common obstacles and pitfalls. The salient features of this system are a) it helps the blind to avoid obstacles in his/her direction of movement within a distance of up to six meters b) gently guides the blind around the obstacles using a combination of five vibrators c) detects and informs the blind about holes in his/her path and d) describes to the blind, using an audio system in conjunction with 2D printed codes, about offices/rooms and stairs within a building. The developed system comprises of four main parts; Kinect unit, processing unit, microcontroller with IMU sensors (3D-gyroscope, 3D-accelerometer and magnetometer), and vibrators, as shown in the following block diagram.

The operation of this system begins from Kinect unit. It is a motion sensing input device developed by Microsoft for the Xbox video game and Windows PCs. It consists of IR depth sensor and RGB camera. It obtains the depth image data of the environment and sends it to the processing unit, which is a Tablet PC. An algorithm was designed for converting the depth data to a sequence of bytes, which will be sent to the microcontroller. This algorithm was implemented using C# programming language. Based on the received data, the microcontroller (Atmel XMEGA-A1 Xplained) will control the vibration of vibrators via drivers (Darlington transistor arrays). Four of these vibrators, which are mounted on a designed belt for the blind and the fifth vibrator is placed on a light helmet. The belt vibrators are placed such that their vibrations indicate the direction of the obstacle(s). The helmet vibrator changes its vibrating frequency (from 1-4 Hz) to let the blind



Smart Guidance System block diagram

predict the distance of the obstacle in front of him. The IMU sensors data are sent from microcontroller to Tablet PC to be used for real-time path determination and for differentiating the obstacles whether they are above or below the floor level. The "ARToolkit" software, with 2D printed code that can be detected by RGB camera of the Kinect sensor, is to be utilized so that information obtained from the code is converted to an audio announcement. Audio instructions will also be used for announcing any serious problems such as a slippery floor or a hole, etc.

The testing of the system has been done successfully in indoor environments. It was, however, observed that the Kinect sensor was not able to detect obstacles at a distance of less than 0.4 meter. Another limitation is that it cannot detect glass as an obstacle. To overcome these limitations, an ultrasonic sensor is now being added to the system in order to detect glass and also detect obstacles within a distance of less than 0.4 meter.



A user wearing our system prototype



3D Cardiac System: Multimedia of the Human Body System

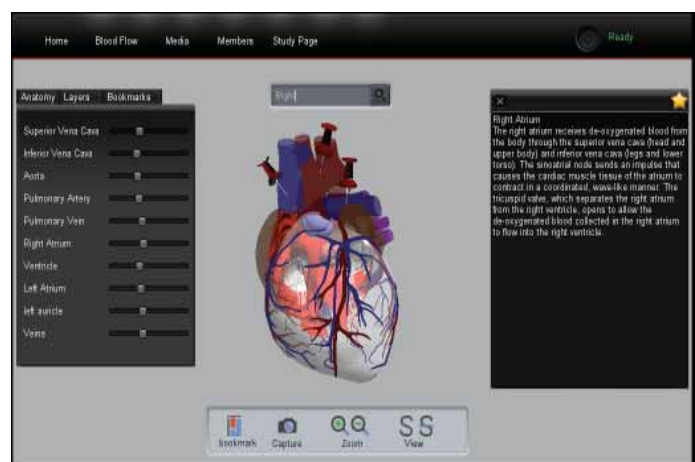
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ABSTRACT

3D Cardiac System, a web-based application, is an informative, interactive, and entertaining adventure in the anatomy of the heart body system. It will assist the students with basic to advanced level of anatomical medical knowledge to examine, manipulate the heart from various angles and understand how it works in details.

Medical students, heart specialists and patients face understanding difficulty to study and investigate the heart due to absence of a sufficiently accurate model of the heart. Moreover it is hard to imagine how the heart functions by only looking at plastic models or 2D images. Hence, we built a multimedia system with interactive interface that allows 3D interaction with the virtual human heart where users can identify all of its elements, with the capability of seeing through it to learn the exact position of its components. The system also provides animated simulations to make users understand the functions of the heart more accurately.



The 3D Cardiac System is specific to the anatomy of the human heart that is 3D visualized allowing users to manipulate the heart, and to understand its vital function and terminologies. Our users are categorized as visitors and members. Members can use all the features provided for visitors. They can rotate, zoom, slice, and change the transparency of the heart. In addition, the members can bookmark different elements of the heart, and they are provided with a study page where they can keep records of the important information they found on the site for future review, and gather links collection of related articles and subjects.

The primary goal of this project is to build an interactive web application to help those who are interested in studying the components of the human heart. Also we aim to offer animations of the heart in various cases, for instance, heart rate changes during\after exercise and to explain common heart diseases.



Hotel website creation, management and reservation system

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ABSTRACT

Numerous hotels abandon the prospect of creating and maintaining a website because of the cost involved in hiring a developer to create the site followed by significant expenditures associated with maintaining the web site and constantly updating it to keep pace with new technology. However, such hotels suffer a substantial loss in business since nowadays people prefer to search on the internet for hotels and rely on their websites to obtain detailed information about location, amenities, room availability and prices. Potential customers are also more comfortable in making, modifying and cancelling room reservations online rather than by directly calling the hotel management.

To enable a hotel to avoid the cost of hiring a developer yet not deprive it of the benefits of having its own website, we are developing a software package that allows the hotel management to create and maintain their own website. The use of this package requires nothing more than the most basic computer skills. The hotel can purchase a domain name and then install the package on the domain server by following some simple installation instructions provided in a user manual which will accompany the package. The software will provide the following functionalities:

- Posting and editing of general hotel information (location, nearby attractions, contact information, amenities, pictures, etc.).
- Posting and editing of room information, including uploading of pictures and listing of prices.
- Allowing viewers to check on room availability and prices.
- Allowing viewers to make reservations and emailing them confirmations.
- Allowing customers to modify or cancel reservations and emailing them confirmations.
- Emailing alerts to hotel management about new reservations or changes/cancellations of existing reservations.
- Allowing hotel management to make, modify and cancel reservations.
- Allowing viewers to subscribe to/unsubscribe from a hotel listserv.
- Allowing hotel staff to send emails about hotel events, special deals, etc., to subscribed users.
- Allowing site visitors to speak with hotel staff during normal business hours through a chat window.

Unlike other hotel website creation systems which simply provide a hotel an account under their domain name, e.g., www.hotelwebsite.com/hotel_abc, our system is unique in that it enables a hotel to create a website under a domain name of its choice, e.g., www.hotel_abc.com.

The system will be implemented using Java and PHP programming languages. MySQL will be utilized for creating and managing the website related databases.



Vehicle's Spare Parts Finder

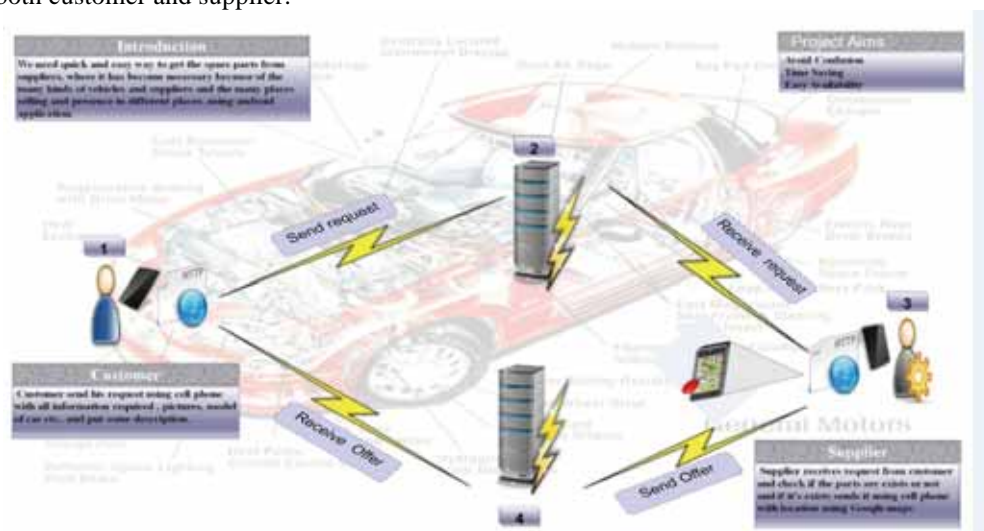
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ABSTRACT

'Vehicles Spare Parts Finder' is aimed to get the exact spare parts from the various supplier suppliers spread across the city or province. There are many kinds of vehicles and suppliers or shops at many places selling the spare parts. Our system will use electronic services in an effective manner designed to use modern gadgets such as smart phones and web site to facilitate communication between the supplier and the customer. The idea is to build a system that allows a user to communicate with different suppliers at the same time and easily get the best offer quickly, then locate the shop of selling spare parts using map. The proposed system called 'Vehicles Spare Parts Finder' will be able to avoid confusion between the customers and the suppliers. Nowadays a customer gets more problems to find out the exact spare part in the market especially if the vehicles are an old model. The second hand spare parts seller also faces problems to sell all parts of a cancelled and dumped vehicle in their warehouse. Our system will be also able to save the time by avoiding directly going and searching in the market and getting a direct contact with best offered supplier. The other main issue that is to be handled by our system is ease of availability from both sides of customer and suppliers.

In our system we are going to integrate different IT technologies which include Smartphone application, website, data base server and GPS (global positioning system). The customer and supplier at the first step of using our system must be registered for an account. All the activities of each user within the system are going to be linked to his account and a normal user can search for spare parts of his car in a specific area. Our project is intended to make the suppliers to reviews the customer requests and respond to them in a simple way. The supplier can review the purchase orders sent by the customers and respond to it with the price if the parts are available with them and using the map they can specify the geographical position of their location also. The customer can review the offer lists that are sent by various suppliers. Then select the best offered and see the supplier information to contact them. The final output of 'Vehicles Spare Parts Finder' will be able to achieve the time saving, cost saving, minimal effort facility for both customer and supplier.



'Vehicles Spare Parts Finder'
In Action



Research about Artificial Intelligence in Facial Recognition Systems

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ABSTRACT

This Research is about Face recognition, which represent a new problem in the field of image analysis and computer vision, and in this research we will describe the face recognition technology and explain some of Artificial Intelligence techniques and algorithms and application that are related to face recognition, with the local and global impact on industrial organizations and society.

Face recognition programs works by measuring salient features of the face, such as the pupils of the eyes and the tip of the nose. The distances and angles between these are different between a face and another. Variations in pose and illumination, which may produce changes larger than the differences between different people's images, are the main challenge for face recognition. The goal of recognition algorithms is to separate the characteristics of a face, which are determined by the intrinsic shape and color (texture) of the facial surface, from the random conditions of image generation.

Face recognition system should include three stages:

- 1- Detecting human face area from images.
- 2- Extraction of a suitable representation of the face region.
- 3- Classifies the facial image based on the representation obtained in the previous stage.

Intelligent systems are being increasingly developed aiming to simulate our perception of various inputs (patterns) such as images, sounds...etc. Biometrics is an example of popular applications for artificial intelligent systems. Face recognition by machines can be invaluable, and has various important applications in real life. The development of an intelligent face recognition system requires providing sufficient information and meaningful data during machine learning of a face.

Artificial Neural Networks are a popular tool in face recognition. They have been used in pattern recognition and classification, and it could be used to recognize aligned and normalized faces.

The method for obtaining face images depends on the underlying application. Some of the applications, such as access to a secure domain, may necessitate the forgoing of the nonintrusive quality of face recognition by requiring the user to stand in front of a 3D scanner or an infra-red sensor. So, depends on the face data acquisition methodology, face recognition techniques can be broadly divided into three categories:

- 1- Methods that operate on intensity images.
- 2- Those that deal with video sequences.
- 3- Those that require other sensory data such as 3D information or infra-red.

As a local impact, a system for facial recognition to identify missing and found people in "Hajj" – "Umrah" is described as a web portal. It present a novel algorithm for recognition and classifications of facial images based on applying 2DPKA to a 2D representation of the Histogram of oriented gradients (2D-HOG) which maintains the spatial relation between pixels of the input images. This algorithm allows a compact representation of the images which reduces the computational complexity and the storage requirements, while maintaining the highest reported recognition accuracy.

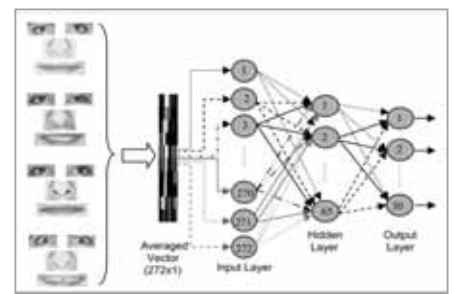


Fig.1. Neural Network.



Fig.2



Towards Eliminating Learning Difficulties for Beginner Pianists

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ABSTRACT

Computer-based music teaching has been an ongoing field of research since the late 40's. There have been many attempts to completely automate the process of teaching Piano through techniques such as automatic music transcription; however, beginner pianists still face a handful of difficulties while learning to play Piano. These difficulties include: not being able to figure out music by ear, and even if music sheet is found, it's difficult to read. The second problem is that most music pieces are of a fast tempo, and can't be played by beginners. Beginner pianists also often find difficulties figuring out the key of a song as it requires music theory knowledge. The final problem is that beginners need a teacher to listen to their performances of a song and evaluate it.

State-of-the-art music teaching systems suffer from many limitations, which make their efficiency questionable. When it comes to automatic music transcription, these systems have a narrow note range that can be identified, they also can't figure out the key of a song, and they can't evaluate a user's performance of a song, compared to the original recording. Finally, their accuracies are usually not high enough to replace a human piano teacher.

Based on the fact that there is no system that manages to efficiently eliminate the aforementioned piano learning difficulties, a system is proposed that would automatically transcribe monophonic music, which means one music note can be played at a time, using the Autocorrelation algorithm, convert it to MIDI representation, and plays it on a virtual piano. This process can be visualized as a conversion of music from low-level representation to high-level representation using digital signal processing algorithms and techniques. The user can also control the speed of the song and can loop a chosen part at a gradually increasing speed in order to tackle difficult parts. The system is able to accurately figure out the key of the song by using Krumhansl and the correlation algorithms. Finally, a new algorithm is proposed to compare the user performance of a song with the original recording and evaluate the player's performance through producing a score that resemble similarity of the performance to the original recording.

The proposed system is able to produce very accurate results and can be used as a commercial package to teach people how to play monophonic piano music without a human teacher. It can be further developed to perform the same functions on whole orchestras instead of monophonic music. This would allow a band to choose a song, and the system would teach each member how to play his part of the song on his instrument. Finally, the music transcription module can be used to establish a new online service to categorize and search for music based on the key and tonality, rather than tempo and genre.



Big Data "from Evolution to Resolution"

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Supervised by:
Mr. Ali Rebaie

ABSTRACT

Data surrounds us everywhere ranging from apps, web, sensors, mobile phones, social media networks, blogs, and emails. When the information age started, we were consumers of hardware and software products. However, in the big data era, we became producers of data products resulting in data exhaust. Today, the data revolution is defining a new scope to work within. Data has become the key to improving most sectors and introducing additional features and tools that can make work easier and more efficient. Big data was implemented before, even before the term big data existed, but it's now growing in a wider scale to become a multi-billion dollar industry.

This paper will tackle the steps and actions needed to start making use of the potential of Big Data where there exists a core gap between its evolution and understanding its potential. I aim at setting a clear resolution composed of standards and fundamentals that serve as a recipe to foster Big Data adoption starting from the individual level to the corporate level. It will explain a unique art of developing successful data-driven products while overcoming the challenges. Our approach will increase Big Data awareness and act as a starter guide for anyone (i.e. decision makers, developers and organizations) who want to harness data. On the human's perceptive, we will discuss how to overcome privacy, lack of data science skills, and human collaboration challenges. On the technical perspective, we will suggest how to overcome data challenges from acquisition to integration, modeling, analysis, and visualization. We'll also discuss the basis of refining smarter, accurate, and automated algorithms for better decision science.

If we start from the individual level, we discover that we are data products. We are walking sensors with all devices we are carrying ranging from mobile devices and self-tracking devices. This self-tracking movement is resulting in a new field of discussion which is quantified self. I'd like to link this movement to the ways it's improving industries, connectivity, and global development problems and target advertising. I'd like to propose some applications in Retail, politics, marketing, manufacturing, Telecom, Banking etc...Second, we should focus on the use of big data in achieving improvements to the common good for the sake of improving healthcare or reduce the crime rate. Big Data hype paved the way to increase awareness to the potential of data especially for the common good. United Nations initiated a UN Global pulse program that aims at making use of data for global development purposes. Other NGOs like DataKind was founded to bridge the gap between data scientists and organizations who want to get value and insights from data. Third, with respect to making algorithms smarter, big data is mainly concerned with teaching algorithms and machines for the sake of allowing them to be more efficient and improve themselves by learning. This is heavily done within the artificial neural networks and data oriented algorithms. We need to focus on building such tools that are curious enough and automated in way that augments the role of data scientists instead of replacing them. These systems will become more intelligent as they learn with time. Moreover, we will emphasize the need of generating regulations and global trends to get scientists and individuals involved within the big data revolution which can only be done after we understand the potential of big data.



Memory Plus+: Memory Therapy System for Adults with Learning Difficulties

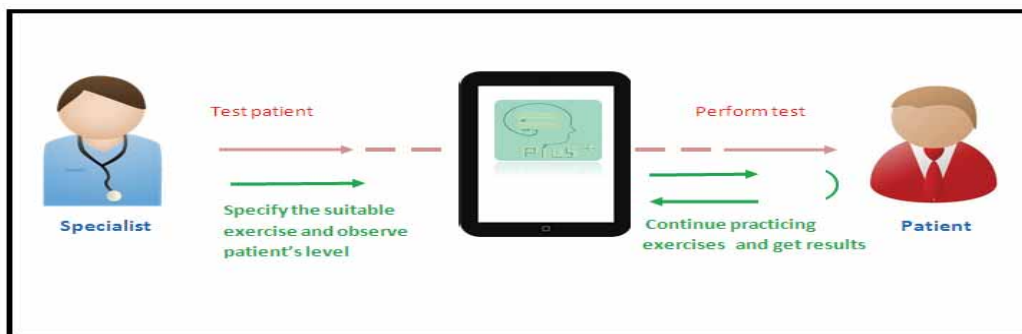
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Supervised by:
I. Eman AlAttas

ABSTRACT

According to the international studies, the prevalence of learning difficulties (LD) is estimated to range between 5-10%. Individuals with LD struggle in the basic learning skills (reading, speaking or writing). A learning problem may also affect the individual's social life -not only his academic life- and prevents him from incorporation with the society and having successful relationships. Some of the main areas of difficulties are information processing, communication skills, concentration and memory which is our concern. People with LD have memory weakness in one or more channels (visual, auditory or kinesthetic). Specialists treat them through different steps. At the beginning, they use different tests in order to determine weakness type and level. Then, they give them exercises according to the test results. After that, they continue evaluating and improving their situations. This requires periodical visits to the specialists which is difficult for some people. Especially for those in cities that do not have treatment centers. Applications aimed at memory improvement in Arabic are often designed for developing memory skills for typical users, not for LD people. Also, the specialist cannot access the application in order to trace his patients.

Memory+ is an iPad Arabic application to serve adults who suffer from memory weakness resulted from learning difficulties. It contains test that determines type of weakness (visual, auditory or kinesthetic) and level of memory weakness. Then, it improves memory by suitable exercises suggested by the specialist. It provides access to the specialist to observe and control his patient therapy remotely by using Internet. The patient can perform the test and then using the exercises to improve his level. Also, the patient can see his performance in all exercises since his registration. It provides report for the specialist about his patients that contains the detailed of the current level and patients' history to make it easier for the specialist to measure the improvement and plan for the next step in the therapy. Figure (1) shows Memory+ end users.



Fig(1): Memory+ end users.

User-Centered Design (UCD) approach will be used in application development to ensure its usability and efficiency. It will be built on iOS platform to be used with iPads. Xcode will be used for implementation and SQLite for database.

Memory+ aims to fill the need of Arabic application in diagnosing and improving memory weakness for LD people. It will save efforts and time of the specialist by keeping track of his patients. Also, he will be able to help more patients since he will not be longer responsible for doing a test or exercise manually, analyzing results and keeping it on the patient's history file. For the patient, it will be much easier to take the exercises anywhere, anytime no need to visit his specialist personally and be able track the progress of memory skills effectively.



Vehicle Average Speed Measurement Using Radio Frequency Identification

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ABSTRACT

As the number of speeding-related car accidents increase, it becomes necessary to build a strict system to identify speeding vehicles and enforce speed limit on them. Radio Frequency Identification (RFID) presents the best ability to identify objects in a certain range. RFID is an electronic method of exchanging data over radio frequency wave. It is a system that transmits the identity of an object or person wirelessly, using radio waves. Utilizing that ability with Visual Basic 2010, a system is created to approximate the speed of a vehicle between two RFID readers coupled with a user-friendly GUI. The program is designed with an intuitive GUI making it easily accessible to the user.

RFID readers will be placed at known, predetermined distances from each other, Figure 1. The passing vehicle carrying an RFID tag will send its unique number to the reader which will log the exact time this vehicle has passed. The first RFID reader will log the time the vehicle first passes in its range; this is initial time, t_i . The final time, t_f , is logged at the following RFID reader. These two readers will be separated by a known distance, D . By measuring the time the vehicle needed to pass two consecutive readers, the average speed can be calculated using equation (1).

$$V = D/t \text{ where } t = t_f - t_i \quad (1)$$

The vehicle's speed must be at some point equal to the average speed calculated from the mean value theorem. Speeding ticket can be issued immediately if the calculated speed exceeds the speed limit.

All that information will be stored in a database. This database can easily be update and by the user to account for new vehicles or any change in information. The user will also be able to adjust the speed limit and distance separating the two RFID readers.

License plate removal is against the law. Similarly, removing RFID tag from vehicle should be illegal to insure the system works correctly. RFID on metal, ROM, is a tag deigned especially to work on metal surfaces and can be fixed to a vehicle surface.

A comprehensive study of the existing speed measurement systems was done to evaluate and study each. That gained knowledge was used to design the RFID vehicle speed measurement system. This technique provides advantages such as, low cost, easy integration, and accurate speed measurement. It is also hard to cheat this system since any instant of speed limit exceeding along a road can be detected.

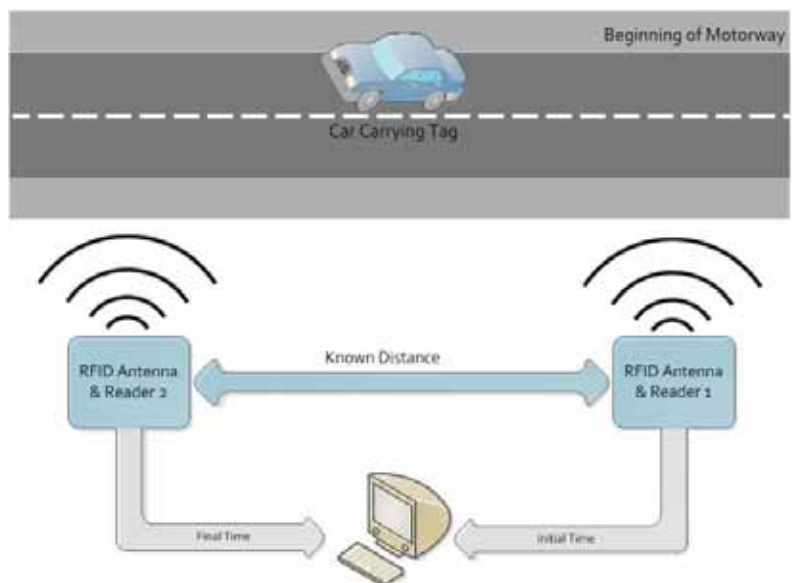


Figure 1 Graphical representation of speed-measuring RFID system.



Intelligent Restaurant (IRest) System

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ABSTRACT

Most of the restaurants are crowded with customers; so if you want to eat food, you will wait for a long period of time before even requesting your order. It is therefore, the number of customers waiting in queues will increase. Sometimes some restaurants take some measures like increasing the number of staff workers to accommodate the huge number of customers to serve, which is not very effective at times. Other scenarios may happen when customers stop ordering from a specific restaurant due to overcrowding. Even after being able to order, the customer may face another problem i.e. there is no place to sit to enjoy the meal. With the latest technologies available to utilize, our system (IRest) integrates some of the IT technologies (database, web server, android platform) to find a technological solution to the problems mentioned.

"IRest" System gives the ability to get complete ordering food by few touches on the smart phones screen, remotely. It will help the restaurant to prepare the orders on time. It will prevent the occurrence of overcrowding in the restaurant. "IRest" system will include all procedures of ordering food (give precise order, reserve dining table and pay the bill), that will lead to no waiting neither on the dining table nor on the preparing order.

Customers can order food by installing an application program in their smart phones and then they will send a request with specific time and place to the restaurant through the web server. Web server will process this order then replay to the customer by Short Message Service "SMS". SMS contains details and ID of the order. After that, the restaurant side will receive the order and prepare it on time. The server will notify customer's smart phone about the remaining time.

Our system has been developed using agile methodology of software engineering which means that it can evolve with technological advances. On the other hand our system will also help blind people by using voice technology to give order on their own. We will add new features to our system, so that's two parties friends can send invitation of reservation on specific time and place. The receiver may response by either accepting or declining it.



Fig.1. IRest System



ABG Test Analysis

An intelligent medical mobile application

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ABSTRACT

An arterial blood gas (ABG) is a blood test that is performed using blood from an artery. An ABG is a test that measures the arterial oxygen tension (PaO_2), carbon dioxide tension (PaCO_2), and acidity (pH), as well as other components. ABG test gives a picture of the patients' respiratory and metabolic status even if the person is fully sedated. ABG test is used to determine the acid-base level in the blood of people who have heart failure, kidney failure, uncontrolled diabetes, sleep disorders, severe infections and to find out if the patient need extra oxygen or help with breathing (mechanical ventilation). As a result, the ABG is one of the most common tests performed on patients in intensive care units (ICUs) and in the ER.

The problem that comes with ABG test is how to interpret the test results, inexperienced doctors in critical care often find it very difficult to interpret the results because the interpretation process can be complicated and the decision that needs to be done regarding the patient is very critical. For that purpose calculators, monograms, and rules of thumb are commonly used by doctors. Moreover, based on the test results doctors at the ICU or the ER often need to perform some calculations in order to give the patient the proper amount of medication, performing such calculations manually can degrade efficiency.

Our proposed solution to this problem is to design an application that can help doctors and nurses to interpret the results or to perform the calculations easily and in minimum time possible. We aim to implement a mobile application running on iOS, specifically on an iPhone device for the complete analysis for the ABG test which can help the medical personnel not only to find the accurate interpretation, but also to perform complex related calculations which will increase accessibility and efficiency, where all they need to do is only to input the gas values taken from the machine measuring the blood gases and the result will appear in short time.

Domain experts were involved in the design phase where we conducted several interviews and develop several paper prototypes. The software requirements and specifications needed to develop the application were collected from our domain experts including medical doctors (MD), and registered respiratory therapists (RRT) at the National Guard Hospital and King Khalid University Hospital. Our application uses a rule-base interpretation algorithm developed in collaboration with domain experts.

In the international domain, Medical calculators especially ABG considered as an essential application in the medical field. Medical personnel have to do certain calculations properly to reach the appropriate diagnosis, otherwise any mistake might reach to serious consequences up to a level of a patient death. So our application will help them to decide and take the right choice which would ease their workload, simplify the complexity of the things they do, and reduce the life threatening errors. In general, our application aims to relieve the complex and repetitive calculations and reference searches routinely performed by medical staff to increase accessibility and efficiency.



Solar Thermal Power Generation System

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Supervised by:
Dr. Reyad El-Khazali, Dr. Ibrahim Abulhaol, and Dr. Issam Qattan

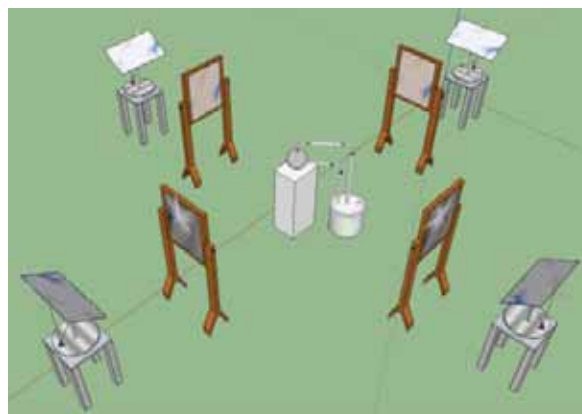
ABSTRACT

The aim of this Engineering Senior Design Project is to build an environmentally friendly "Solar Thermal Power Generation System". The motivation behind this project is to demonstrate that clean energy can be generated using renewable energy sources instead of relying on the conventional, yet harmful, depleting energy sources of energy. Overall, this eco-friendly system will consist of four main parts which are the heliostat system, Fresnel lens, heat exchanger, and a power generation unit.

The heliostat system consists of three heliostats which are generally called reflectors. Each reflector device has a mirror embedded on top of it to reflect the sun beams on a particular spot continuously by tracking the sun with the help of sensors and real time clocks. The heliostat system will be controlled using a real-time algorithm via an Arduino microcontroller. The objective is to design a real-time controller that tracks the sun and reflects sun beams on a fixed point automatically without any human interaction.

The second part is to direct the sun beams into a Fresnel lens. Again, there will be three Fresnel lenses for each reflector. These Fresnel lenses act as solar concentrators in which they tend to boost the sun's beam up to 10 times its normal power. Thus, efficiently, taking advantage of the sun's beams in order to produce the maximum possible heat at a fixed point.

After being magnified by the Fresnel lens significantly, the sun beams will be concentrated on a customized heat exchanger placed on top of a tower. The heat exchanger is divided into two parts. The first part consists of a transparent glass containing a cylindrical aluminum metal coated with black paint with pipes wrapped around it. The second part will be a water reservoir placed a bit higher in order to fill the pipes with water. A valve will be used in order to determine the speed of the water flow. The pipes will be filled with water from the bottom all the way to the top and a nozzle fixed at the end of the top pipe will be used to release pressurized steam. The ultimate goal would be to produce maximum pressurized steam in a shortest time possible.



The last part of this project is to use the generated pressurized steam in order to generate electricity. This can be achieved by using an aluminum steam turbine firmly embedded on a DC motor. The DC motor will be connected to a Light Emitting Diode (LED). The released hot steam will forcefully make the turbine rotate. This rotation will allow the DC motor to generate electricity and light up the LED, converting mechanical energy into electrical power. Once the team successfully manage to light up a LED, the efforts and concentration of the team will be redirected toward increasing the load.

This project can serve companies and governments alike willing to cut down on pollution and CO₂ emissions. Possible disadvantages can be the time taking to generate pressurized steam and storing energy needed when the sun sets.



IAMCG: Interactive Autonomous Mobile Campus Guide Robot

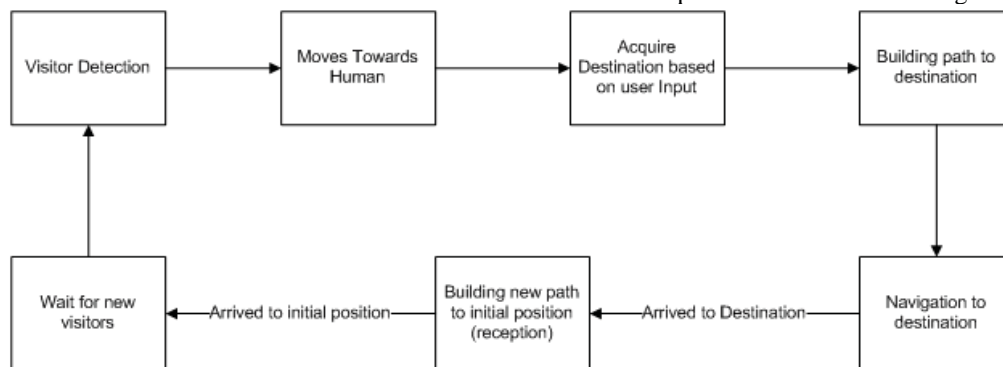
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ABSTRACT

IAMCG is an interactive autonomous mobile robot system. It can work as a receptionist to lead the visitors to reach their wanted destination within a building or a campus.

The goal of the system is to control a robot to act as a regular receptionist. It can identify and detect visitors through a face detection technique. The robot works according to the following scenario. Initially, the robot stays in the reception area of the building waiting for a new visitor. If a visitor is detected, it approaches towards them and initiate interaction with him or her responding to their queries. Once a visitor tells the robot about the destination or the room they want to visit, it shall determine the proper path and guide the visitor to the desired destination. The robot shall then go back to the reception and waits for another visitor. The flow chart shown below summarizes the main steps of how the robot is designed to work.



The IAMCG is designed in a modular way to make it easy to be modified, upgraded and maintained. It is implemented using Robot Operating System (ROS) framework, and an open source middleware that helps implementing complex algorithms and system using inexpensive hardware and sensors. The ROS supports wide range of prebuilt robot platforms such as the Pioneer, Adept robots, Robotnik and many other models. This feature makes the IAMCG highly portable and allow various pre-built robotic platforms to be used as base of the IAMCG.

The **IAMCG** is not the only inexpensive robotics system available, there are other systems such as the ROBOTIS DARwIn-OP humanoid Robot or RoboPatriots models from GMU Autonomous Robotics Laboratory. Many of these systems lack of portability due to the fact that they do not use cross-platform framework such as ROS. Instead they are implemented using development kits that are specific to the robot platform used in the system. **IAMCG** on the other hand has high level of abstraction from the hardware allowing us to implement the system with variety of robot types and models as long as they are supported by the ROS framework.

Comparing the system with other hi-tech expensive models such as the REEM Robot, **IAMCG** is designed to use inexpensive hardware components to perform the optimum functionality. For example, The **IAMCG** only uses ultrasonic sensors to localize the robot on the map while other system like the REEM tend to use more expensive tools such as laser range finders or indoor positioning systems

As it is mentioned earlier the robot guides visitors to the specified destination and returns to the reception area. During this navigation the robot may deviates from the specified path or even gets lost. Therefore localization technique is built locally using the Particle Filter Algorithm to localize and relocate the robot position. Particle Filter Algorithm uses handful of ultrasonic sensors to measure the distance from the robot and its surrounding objects. This algorithm estimates the robot's current position by comparing readings from ultrasonic sensors with logical distances from points on the map, the point that have similar distance from its surrounding on the map has higher probability to be the robot current position. In theory, the Particle filter algorithms is an optimum method to localize the robot without the need to additional expensive hardware.

The IAMCG is an example of non-expensive robotic system that can improve public services and assist employees in their daily work in locations such as , Universitycampuses, museums and hospitals.



Parking Finder Application

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ABSTRACT

A mobile applications that provides a services for users to search for the parking area that exist in a town is very commonly in the mobile application world. But there is no such application that allow people by the use of their mobile phones to search for a specific parking block in a specific place as well as tracking the path of each parking block. Such as Parking Finder that allow users to search for and track any parking. Such as Parking Finder the user will able to save their time form lost, where they can know which parking is available and which is not before they reach the parking area. Such as Parking Finder will allow those user to track the path of a specific available parking. Parking Finder provide also a smart finding that works without doing a manual search for parking “ When you become near from your destination, Immediately I will provide you with all available parking “.

The main goal of Parking Finder is to use the possible technology provided to improve the other parking application. In order to make the process of searching for parking area's more specialized so that users can also serch for the available parking in parking area. Parking Finder is based on Android devices and some other technology tools called “ Distance Sensor “ and “ Arduino Board “ that are connected together into a web server. Where in each parking block there is a single distance sensor, and those sensors are connected to the server through the arduino board. Figure1 shows a high level architectural diagram of the proposed solution.



Figure1

Now every one who's facing a difficulty in having a parking between a lot of parking blocks no worry any more. Where by the use of android mobiles they can parking their cars in a very easy way and without wasting their time. This result has make the idea of previos parking applications supper useful in our daily life.



An Android Application for Diabetes Management

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ABSTRACT

It's critical for diabetics to manage their medical conditions, take their medications on time and keep a record of results that they are getting through their exercise routines, dietary programs, and medication regime. It is impractical for the patient to keep logging information with every activity as patients might eventually get bored with the process of logging information with every activity or may forget important information. To avoid this hassle and to ease the process of acquiring data, a new android application called *ExtraCare (ETC)*, designed to provide quick and easy way to get blood glucose measurements from Bluetooth-enabled blood glucose meter to Android mobile device. In addition, *ETC* will offer a variety of opportunities such as cost saving, decreasing patient's life loss hazards in case of emergencies, saving valuable hospital spaces and better data collection for research and development purposes.

There are several Android applications that help to follow up diabetics by tracking a number of items like their glucose, weight, exercise, diet, and medication. For instance, *On Track* is one of the applications that help diabetics to generate several graphs and reports that the patient can email to the doctor. However, users claimed that the application lacks some features like zooming in/out. Furthermore, users have to always remember to backup their data, since the application does not automatically backup the user's data. Another application called *dbees* mainly has the same features as the *OnTrack*. Despite the fact that the application seems to perform a daily backup procedure, many users complained of losing their information, and having problems when logging in to their profiles.

So the proposed application takes advantage of the measuring devices equipped with communication modules via open platform structure to exchange health information between patients and doctors directly. Patient's can continuously track their health on the go and receive real time assistance. The measuring device sends the test results to the application which in turn send them to the doctor for evaluation. Installation is required in both doctor's and patient's smart phones to synchronize data. The user will have a choice to connect to Bluetooth for automatic tracking or disconnecting to enter measurements manually. When the application is first started, it will prompt the user to setup information's such as; age, weight, gender, diabetes type, medication and emergency contact number. Setup information can also be configured for automatic operations that include but not limited to "sending SMS", "emailing messages", and "emergency calling". The automatic configuration is designed for cases such as fainting due to blood glucose level. The mobile application will generate an alert when the blood glucose is not measured for a period of time. If the patient didn't respond for such an alarm, a message will automatically arrive to the emergency contact number indicating that the patient is having problems or symptoms due to unstable blood glucose level.

The patient can also insert additional information such as temperature and blood pressure in the designated area if needed. In addition, the ingested meal type and insulin dosage should be logged manually by the user. Patient's data can be saved, backed up or exported. An export data file will be created with all the data saved to it. The export data file will have the date and time saved into the name. This file can be copied and stored elsewhere for safekeeping or transferred to another Android device. Reports can be shared over SMS, email, or any other installed sharing option: each individual measurement has a Share menu option. The application provides graphs and statistics on daily, weekly or monthly bases. The application is customizable for tracking the symptoms selected by the patient. The design is intuitive with a user-friendly interface. The application will soon be available through Android market and can be downloaded and installed with a single touch.

Maximum Power Point Tracking (MPPT) Simulation of a Photovoltaic System Using MATLAB/SIMULINK

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ABSTRACT

In order to fully utilise the Photovoltaic (PV) array, it must operate at its Maximum Power Point (MPP) despite the changes in the environmental conditions. This can be achieved by placing a DC-DC converter between the PV array and the load as shown in Figure 1. These power electronics converters have controllers which employ some techniques for maximum power point tracking.

This paper will describe the model developed and the algorithms used, using MATLAB/SIMULINK, to track the MPP. The results obtained will also be presented. The Perturb & Observe (P&O) and the Incremental Conductance (IC) techniques were used. The algorithm of one of the techniques used (i.e. the P&O) is shown in Figure 2.

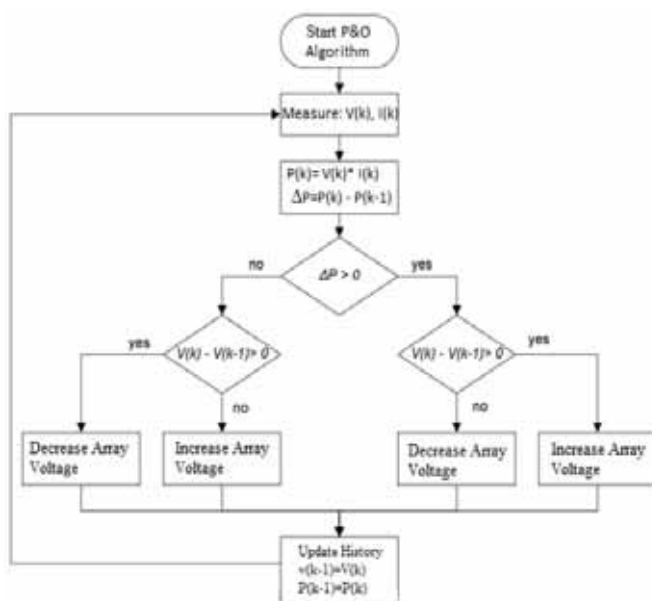


Figure 2 Perturb & Observe algorithm

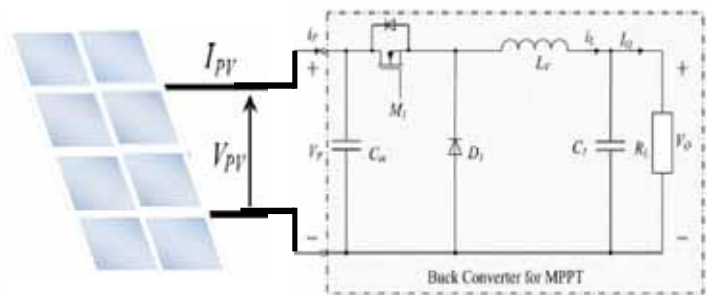


Figure 1 Maximum power transfer in a PV System

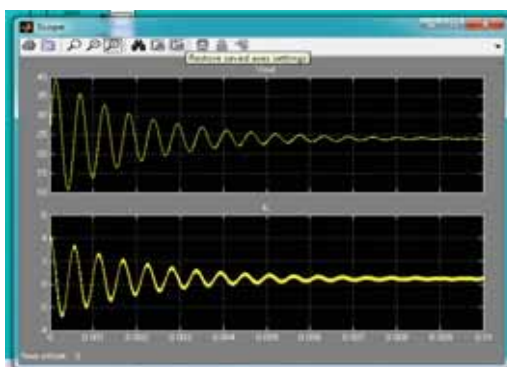


Figure 3 Output voltage and Inductor current of a boost converter (duty cycle = 0.5)

In Addition, different types of DC-DC converters were designed to evaluate the converter performance. A simple method which combines a discrete time control and a PI compensator is used to track the maximum power points (MPP's) of the solar array. Two different converters were used in this study. The Buck converter (step down) and the Boost converter (Step up).

Due to space limitations only sample results are presented here. Figure 3 shows the output voltage of the boost converter for an input voltage of 12 V, duty cycle = 0.5 and a sampling frequency of 100 kHz. The efficiency of the converters has also been investigated.



Anywhere Reminder: A Location/Time Based To-Do List

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ABSTRACT

People used to use paper To-Do list for their every day task however, paper To-Do list cannot be tracked. Most of the time, people prefer to keep track of uncompleted task, task they have been done, and where the task is going to take place.

Outdoors people may pass the place at which they should accomplish their To-Do list without even realizing before that they are around the place. Consequently, in some situations the importance of remembering the locations exceeds the importance of remembering the tasks.

Considering the substantial role of To-Do lists in people lives and the efficiency that is brought by technology, a lot of smartphone applications based To-Do lists have emerged. However, in general, most of the existing applications clutter the user interface with a lot of unnecessary features that consume a lot of time to write a simple list.

Anywhere Reminder aims to organize and manage the daily tasks and errands by keeping track of completed tasks and the tasks that have to be done, with the functionality of linking those tasks to a particular location or specific time to remember them.

Anywhere Reminder provides users the ability to create their task's list and assign it to a specific location. When the users approach the assigned location, the application will remind them to accomplish their tasks.

To give the users greater control over the reminder, a distance option is provided indicating the location's vicinity range at which the reminder will be launched. Moreover, with the assist of Google Maps the application presents to the users an integrated interface that helps them to determine locations. In addition, it allows them to manage the locations by naming them. As some users may not be familiar with an area or location, our application will guide them by illustrating a path starts from their current location to the specified location.

The application supplies place categorization for the pre-located places to save them in an organized way. Therefore, the user can set more than one place under the same category. When the user create a new task he/she will be provided with the option to save his/her task's location under one of his/her previously created categories or to create a new category.

Anywhere Reminder allows users to create new locations and recording them in the history page as a result, users will take less time when setting the reminder.

Furthermore to enhance the facility, the application gives the user the chance to select number of repetition of the tasks to comply with his/her needs. On the other hand, to fulfill the entire users' needs, our application offers a reminder based on date and time.

The application provides a desirable impact on the users duties locally as well as globally, by giving them the opportunity to be notified based on the place.

The application is compatible with Android Operating System and platforms. We use Java as the primary implementation language coupled with GoogleMaps API and android SDK also SQLite for the database.





Detecting Malicious SQL

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ABSTRACT

Web applications are considered as one of the most growing applications that computers provide. These applications contribute to different areas that facilitate various major tasks in our lives such as online banking, electronic commerce and online stores. Furthermore numerous businesses depend on web applications to support their business operations. Since web applications are so important and critical, certain aspects become more pressing than others for special purposes. That is because web developers are more concerned with the functionalities that the application should provide rather than its security. Furthermore, they are not also specialized in the security field and they are not familiar with techniques that hackers could use to have prohibited access to critical information.

Security is considered as one of the drawbacks that affects the usage of the web applications. Furthermore, hackers are using this fault for gaining unauthorized access or hacking databases by sending malicious queries to databases through the interface. Malicious query or SQL injection means using a specific piece of code that is intended to gain access of private data by adding some special characters such as “\$,%,^,&*,@,#,=” in queries. It is safe to assume that such issues need to be handled by rigid and strict methods that address new methods of hacking and fraud.

Many techniques were applied before on many different schemes for the purpose of detecting and preventing malicious queries; but unfortunately, some of them could not detect the abnormal queries that were sent by users, as some of the techniques were not fully able to analyze the queries. The reason behind that was that it was included in the network layer and could not detect insider attacks where the main purpose was to detect whether those sent by users actually contain queries or not. That would have been accomplished by analyzing every character in the query. Another method was to check if there were known injections. Lastly, some techniques were used at run and compile time which are able to only detect special characters.

The proposed system is intended to utilize many different techniques for detecting internal and external hackers. Firstly a database will be constructed between the web application and the main database. The database would contain the IDs, usernames and passwords of the users and further apply encryption techniques on their data fields, specifically detection for special characters and java scripts techniques integrated with PHP language. It is intended to detect and prevent malicious queries sent by users, which would allow for the detection of external hackers sending malicious injections through input fields, as well as internal hackers who have physical access to the main database. The aim of constructing this database is to protect the main database from any abnormal queries. Using view techniques will allow for the user to interact with the database, given only one's assigned authority in terms of operations.

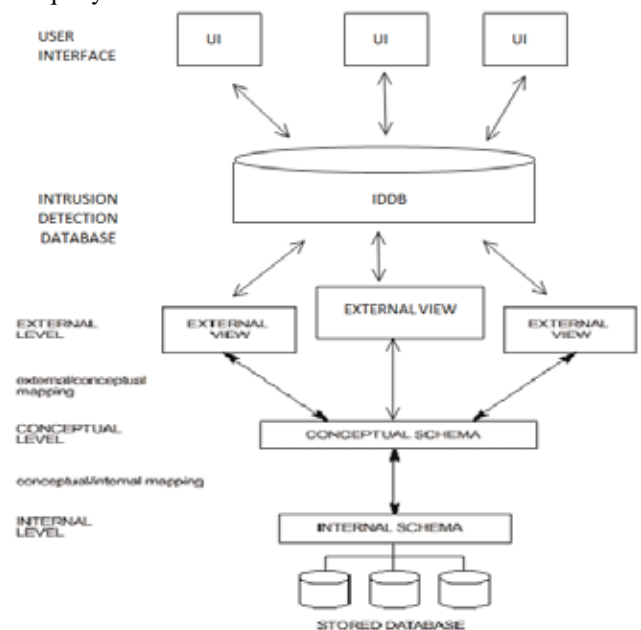


Figure 1: Model of the proposed system



Educational video game: Agriculture greenhouse game

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ABSTRACT

Huge amounts of funds has been dedicated to video games area in the last couples of years as they played a main role in creating an efficient educating environment. This is due to their ability to captivate player's concentration for a long period of time as he learns how to master the game's complexities and accomplish its objectives.

Agriculture greenhouse is the topic we've picked in order to design and implement which aims to teach a player the whole process of how to plant tomatoes and its all related issues. Our main audience will be aged between 12 and 35.

Our work constraints on teaching the player how to plant tomatoes in scientific and practical ways. When the player completes all the game's levels he will be able to start planting in the real world and execute the steps he learned to get the real tomato crops.



This game has two characters, the first one is the player himself while the second is the farmer who will lead the player and give him the correct way to achieve an efficient planting process represented in texts and sound data shown and played for the player from the 1'st step until the tomato is ready to be picked up, these steps will be similar to what we do in the real greenhouse.

The main scenario in the game will focus on the practical steps of planting the tomatoes in the greenhouse, in addition, preserving the environment during planting by many ways for example; using natural fertilizer not chemical, rationalization of water consumption, removing weeds, pest control, etc....

The game will be a third person type with 3D graphics, a player will move with the game character around the greenhouse and will be able to tilling, irrigate, fertilize and plant the greenhouse. After the crop grows, he will be able to pick up crop and sell it later.

Our first game release will support planting tomatoes as a PC game, and then a player can download a second updated version that provides more modules each for a new vegetable kind. This could be sold in the market in order to earn some money to help us continue developing such educational games which can be considered as our own small business start up.



The Effect of the Vent Design on the Precooling Process of Horticultural Produce Packed in Crates using Computational Fluid Dynamics

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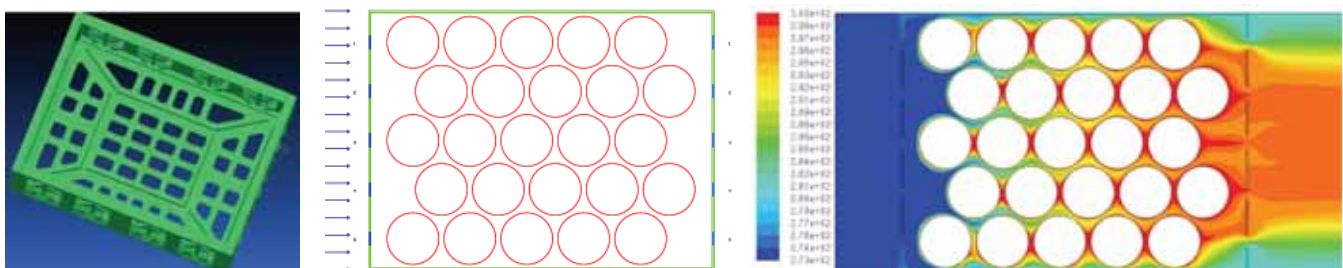
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ABSTRACT

Forced-air precooling process is a popular method normally used to minimize the post-harvest losses and to extend the shelf-life of wide range of horticultural products. In this method, cold air is forced by a fan to flow around fruits packed in a crate through vents. During the cooling process, fruits that are exposed to high air velocities are overcooled while others facing low air velocities are undercooled. This inhomogeneous airflow is a major cause of concern and it is directly related to improper vents design in the crates. Therefore, the correct venting is necessary to achieve rapid and uniform cooling of fruits. However, the strength of packaging also needs to be taken into consideration. The influence of vent design on the cooling uniformity can be assessed by experimental means but this is an expensive and time consuming endeavor. In this work, an investigation is made to study the effect of variation in the size and location of vents in the crate including that of variation of inlet velocity on the airflow and heat transfer distribution within a crate filled with spherically shaped fruits. The typical model of a crate is shown in Figure 1. The analyses were performed employing computational fluid dynamics (CFD) using Gambit as preprocessor and Fluent software as a solver and post-processor. The problem considered in this work is shown in Figure 2 as a two-dimensional model of packed fruits on top of a rectangular tray in staggered position. There are five inlet vents and five outlet vents for the air to flow through. Three different configurations were studied such as 1 and 5, 1-3-5 and 1-3-5, 1-2-3-4-5 and 1-2-3-4-5. The air flow and the heat transfer patterns are governed by the laws of conservation of mass, momentum and energy. The governing equations are discretized and numerically solved using the finite volume method. The computational domain was discretized using a triangular mesh. All the equations were discretized using second order upwind scheme. The pressure-velocity coupling was done using a SIMPLE algorithm.

Typical results for a configuration of five inlet and five outlet vents for steady-state flow temperature distribution is shown in Figure 3. This study shows that the last configuration of 1-2-3-4-5 and 1-2-3-4-5 is the best configuration to provide the most efficient precooling.





Cloud-Based Semi Electronic Government Solution

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ABSTRACT

In today's world, many governments are shifting towards electronic services; indeed to satisfy increasing public demands for a better service delivery. Billions of dollars have been spent to build Electronic Governments, around the world, without always reaching a satisfying result. This might be explained by the many challenges that accompany the process of transforming a government manual procedure into an electronic one. The high costs, procedural rigidity, and digital illiteracy are common obstacles in E-government adoption at different countries. Such difficulties, left many citizens trapped in the lengthy, bureaucratic, and frustrating manual procedures in their daily interactions with governments, *see figure 1*.

In our project we try to tackle this problem, by proposing an intermediate step between a full e-government solution and a typical manual one. We call our proposal Semi Electronic Government Solution, which we define as: the utilization of Information and Communication Technologies to improve government service delivery, without --significantly-- adjusting current manual procedures. Basically, the main idea of our approach is to help governments provide electronic services to citizens, without the need to dramatically change their already present manual procedures. This can be achieved by digitizing citizen's applications and giving the employee the ability to interact with the application exactly as if she/he would do in a manual procedure; however, the interaction itself is electronic.



Figure 1

This can be implemented in different ways; we chose to utilize e-mail as a back-end medium of communication between employees and citizens and among employees themselves while processing public applications. This choice is based on the high efficiency and stability email has reached, allowing for less interruption during application process. To cut the costs and save the government the burden of building and maintaining an IT infrastructure, we chose to use e-mail as a cloud computing service.

So citizens would only need to scan their -- manual based -- application and upload it to a portal with their personal information inserted; where it will be forwarded to its correspondent government representative. After that, the concerned employee who has the authority to see these applications would be able to process them. Then a confirmation message will arrive to the citizen (Notification) telling her that the request was received by the authorized employee and the completion of the necessary procedures is on progress. So, the concerned employee should be able to print, process, sign, re-route, and scan documents then send them back to the citizen, *see figure 2*.

For the solution to succeed in real world implementations (especially in third world countries) it has to be simple, scalable, efficient, and affordable. We believe the solution proposed does provide these attributes and would help many struggling governments provide a more convenient and smooth service to their unsatisfied citizens – yet!

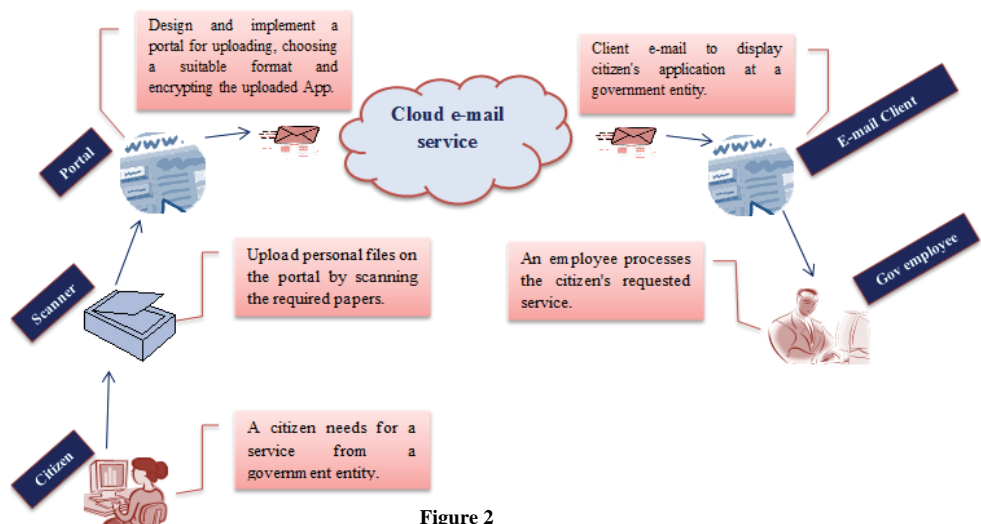


Figure 2



Interactive Physiotherapy for Legs (IP4L)

Afnan AlHazmi, Bushra Al-Zhrani, Doaa Al-Khenani, Mona Al-Balawi, Ohoud Al-Shamrani, Safaa Gedair

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ABSTRACT

From the last few years, relying on video games systems in rehabilitation has been increased. The promising future of this area of research has attracted researchers to get the exposure on how to employee the technology in entertaining patient while treating him/her. One of the studies shows that VRWii (Virtual Reality Using Wii) gaming technology represents a safe, feasible, and potentially effective alternative to facilitate rehabilitation therapy, and its results significantly proven that 9 out of 10 participants accepted the technology intervention in their training sessions.¹

The aim of this research is to introduce Interactive Physiotherapy for Legs (IP4L), which is a medical interactive system provided to physiotherapy community. IP4L main objectives are to improve traditional physiotherapy sessions by embedding technology. This will give the treatment another meaning by making sessions more interactive, gaining patient attention and increasing their acceptance and response. The intervention of video games in physiotherapy sessions is also very acceptable for patients to increase patient motivation and compliance with rehabilitation goals. IP4L is based on integrating different technologies to create a novel virtual physiotherapy application. IP4L system consists of following components:

- **IP4L Virtual Environment:**

- *Graphical Scenarios:* that reflects on the floor some simulating movement that the patient should follow.
- *Touch Surface:* is a program that has been written to turn the floor into touchable surface so we can detect the patient's movement on the graphical scenario.
- *Hardware:* consists of projector, Wii-mote and IR led that can be combined together in specific way to represent the therapeutic graphical scenario on floor by using projector and sense the patient steps by Wii-mote and IR led when he/she walks on the represented therapeutic scenario.

- **IP4L Therapist Interface:**

It is enable therapist to start session by running the scenario, retrieve the information of each session to follow up the progress of patient treatment and print reports.

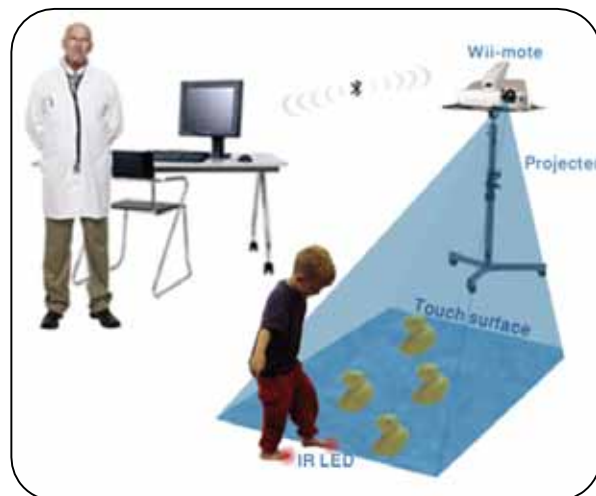


Figure 1: IP4L Component

IP4L will achieve its goal by integrating the previous technologies to sense the patients' steps. When patient starts playing the game (adds steps during session), the Wii-mote will sense for the IRLED that patient wear in his/her legs and the system will record these steps to calculate some measurements that necessary for the doctor. These measurements include the duration that patient takes to finish the session, how many wrong or right steps he/she have done. Also IP4L will detect the patient performance and whether if the patient finishes the session or interrupts it. All the measurements and patient's progress will be stored in database to enable the doctor to retrieve them as needed.

Integrating interactive virtual environment for rehabilitation of various patient populations is a promising and new trend in patient treatment, which adds fun during physiotherapy session comparing with the conventional exercises.

¹ Saposnik,G.; Teasell,R.; Mamdani,M.; Hall,J.; McIlroy,W.; Cheung,D.; Thorpe,K.; Cohen,L.; Bayley,M. (2010, May) Effectiveness of Virtual Reality Using Wii Gaming Technology in Stroke Rehabilitation. PDF.



The Effect of the Vent Design on the Precooling Process of Horticultural Produce Packed in Crates using Computational Fluid Dynamics

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ABSTRACT

Human communication is a combination of verbal and non verbal interactions. Through facial expressions, body gestures, and other non verbal cues, a human can communicate with others. In fact, facial expressions and related changes in facial patterns give us information about the emotional state of the person and help to regulate conversations with the person. The emoticons have been used extensively in chatting to convey one's expressions but they do not always express exactly the right emotions: happy, sad or not interested, for example. Along with increasing availability of chat avatars, it is desirable to simulate human expressions using these avatars to realistically animate the chat experience for the purpose of displaying emotions while preserving the person's privacy.

We proposed an Animated System (AS) to help people to show their actual facial expression in an entertaining way through avatars. The use of the system can be demonstrated with the following example: imagine that you type an ambiguous joke, and to make yourself clear, you have to insert a “:-)” (smiley symbol) at the end of the sentence. If the receiver can see the sender's real-time facial expressions, synthesized by the avatar, the smiley symbol can be substituted or emphasized with a smiling gesture. So instead of character symbols, natural facial gestures can be used to communicate additional information. However, designing such an application is not easy, because of the complexity and variability of human facial expressions that would need to be recognized by a computer. Furthermore, automatic animation of the avatar using the facial expression representation should be done instantly, allowing for real-time application.

Animated System is an Avatar Animation enhanced by Facial Expression recognition using three main functions. AS will (1) Detect the user's face in an image captured by a webcam using ‘*OpenCV Face Detector*’ algorithm, (2) Recognize facial expression (happy, sad, surprise and normal) using ‘*Eigenface*’ approach, and (3) Mimic this expression on an avatar using the ‘*Morphing*’ method. Figure 1 shows the steps followed in this application. Once the user sees the avatar, she/he will understand user's feelings through the expressions of the avatar as shown in Figure 2.

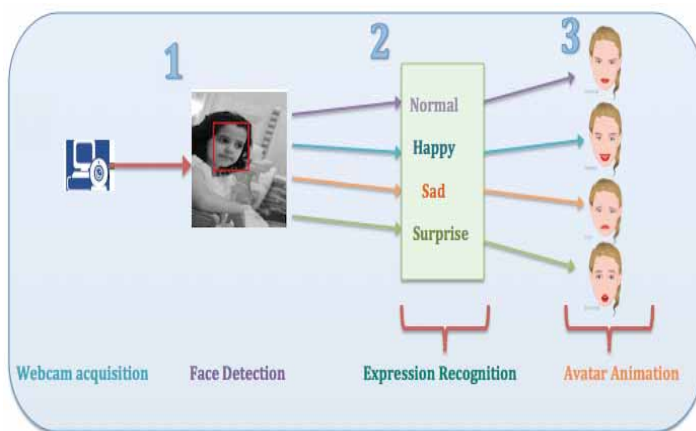


Figure 2: Animated System Processing Steps



Figure 1: AS Interface with Cam Preview Window



Discoverview Saudi

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Supervised by:
Habib M. Fardoun

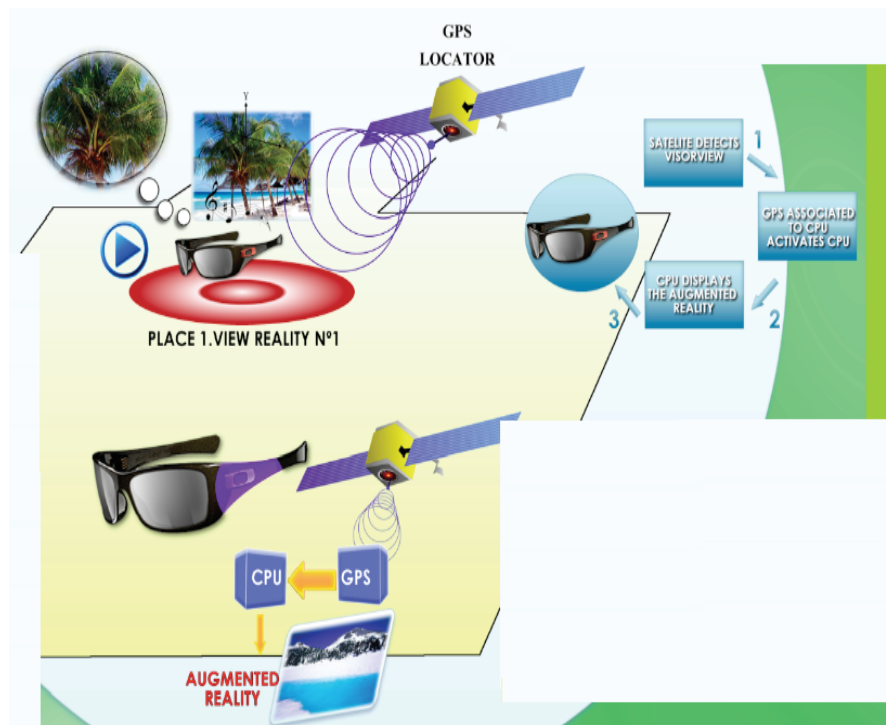
ABSTRACT

“DiscoverView Saudi” is an application used to improve the tourism in Saudi Arabia, where it will enable users to view the touristic places of the country, through the union of three technologies: Augmented reality, Multimedia Viewer and GPS technology. The application consists of a virtual walk by the city by mean of augmented reality, where different places of Saudi Arabia will be described, with a lot of details: visualized and commented historic data, altitude, cultivation, gastronomy; by making use of visual and audio, that introduce the user in a new world.

The system function depends on the GPS satellites. Each satellite of the GPS constellation will emits continuously two different data codes in digital format. These data are transmitted by mean of radio signals. To capture the signals of a minimum of three satellites, by triangulation, the GPS receptor determines the position over the Earth surface by mean of the value of the longitude and latitude coordinates (two dimensions). These coordinates could be expressed in degrees, minutes and/or seconds, or in the measure units used in other geodesic systems. The capture of four or more satellites eases, moreover, the receptor altitude in relation with the sea level (three dimensions). The coordinates of position and other information that could help to the receptor, they will be updated each second or each four seconds.

The work still in its Beta version, in this phase we are building the 3D scenarios of Jeddah’s Cornish, the system consists of a viewer with a processor connected to it and headphones. That viewer by using GPS previously determinate is activated, and reproduces with images the augmented reality and with sounds the entire program available and associated to the beautiful touristic Cornish of Jeddah.

By using this applications users will be able to go through each room available by place, and thus introduces an isolated form to the different augmented realities, in which represents a cultural, touristic and technological deployment affordable and attractive. By mean of a unique GPS geo-locator located at the device CPU, inside a specific coordinates previously programmed, it will determine the CPU’s viewer the augmented reality image emission, as the audio assembly that will complete all a program of a virtual walk, of the unknown and remote places of Saudi Arabia to the most of tourists, introducing them to a world of sensations. Glasses consists of three fundamental elements (Viewer / Headphones associated to a CPU, GPS geo-locator and elaborated work on augmented reality) and it will join the work of different technological, visual, audio-visual, architectonic, info-graphical and design disciplines, to convert the experience in unforgettable.





Chat Mining: Taxonomy of Online Messages

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ABSTRACT

Social network sites have become the most popular communication environment. Chat servers, and instant messaging services provide online users the ability to communicate with each other simultaneously. These services constantly generate large amounts of textual data, providing interesting research opportunities for mining such data. Due to the large amount of online messages stored everyday randomly, it has become a problem to users to go back to their messages log and search for a specific topic in their conversation. Taxonomy plays an important role in this type of services.

The purpose of this research paper is to cluster the online messages in categorical groups. Messages' clustering is depended on the number of word occurrences in online messages. Messages will be divided into different categories according to the keyword given. By parsing the online text messages and according to each key word searched the message will be placed in the appropriate category. Each category will contain a list of messages from different users that addresses a specific subject (ex. Education category will include all messages that carry keywords like: study, assignment, exam, project etc.). At the end of each category there will be a list of top 10 best websites for each category, according to the most repeated keywords in messages. This will ease the way of searching, save users time and make them get the best of the information they share with the other clients. Online messages/conversations due to its mostly informal nature, makes the information obtained more challenging to be assigned to a specific category because most users don't give a care of using appropriate grammar, spelling, word orderings and word frequencies.

Fig. 1- Messages Log.

Fig. 2- Taxonomy of Messages

Fig. 3- Education Category.

How the message log is originally displayed in fig.1, there are several conversations generated everyday between different users. In fig. 2, this is how the new message log will look like after manually creating certain categories. Messages will be included in each category according to the word searched. In fig. 3, it displays the view inside the "Education category" and another search is generated to give the user the ability to obtain a deeper search, then a list of websites will be displayed according to the word searched for. The K nearest neighbor classifier (K-NN) and the Term-Frequency (TF) vector are the techniques will be used in message clustering. The K-NN classification is achieved by identifying the nearest neighbors to a query example and using those neighbors to determine the class of the query. Term-Frequency (TF) vector will calculate how many times the word occurred in a certain percentage then moves the message with these words to its suitable category. In this paper, we study a challenging problem: Deriving taxonomy from a set of keyword phrases. A solution can benefit many real life applications because keywords give users the flexibility and ease to characterize a specific domain.



iRealEstate

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ABSTRACT

Finding houses and departments that match people needs and preferences is one of the common problems. Many tenants and buyers face a lot of difficulties in finding suitable homes to buy or rent. They spend many hours crossing around looking for homes, and after that most of them are still unable to find their dream home. In addition, people who plan to move to another city will face a problem to find estate in this city. Also, women have difficulties to find estates by themselves using the traditional way.

On the other hand, the owners may not have sufficient funds to make extensive advertisements. So their chance of renting will be low.

Locally, there are some systems designed to help buyers save time and effort by providing a list of available hotels and their locations. But they don't provide any functions that facilitate homes searching process. In other words, buyers need to check on all homes and find which the most home match their properties. Moreover, most of them do not include apartments or houses that are for rent besides that these systems do not cover all regions such as Riyadh city.

According to the problems mentioned previously, we have decided to design and implement iPhone application that search and find directly on the iPhone flat or house near or across Riyadh by using maps combined with GPS . It will offer a lot of searching criteria such as: search by price, area, district or even specific properties such as: balcony, swimming pool...etc.



Figure 1 : Screenshots of iRealEstate Prototype

The application assists the user in searching, it can save user's preferences so that whenever new estates match his needs are available, it will view a push notification. Besides, push notification will appear when he arrives near any estate having appropriate properties matching his needs. Moreover, it allows the user to save any estate to favourites to refer to it later. iRealEstate also allow sharing any estates via different social media like: twitter, Facebook and e-mail. As well as, it allows the user to add any appointments to the built in iPhone calendar.

The technology that will be used is Xcode and SQLite for client side. Also, PHP on the top of Apache server and SQL for the server side, and XML to communicate between them.



mBreath: Asthma Monitoring System

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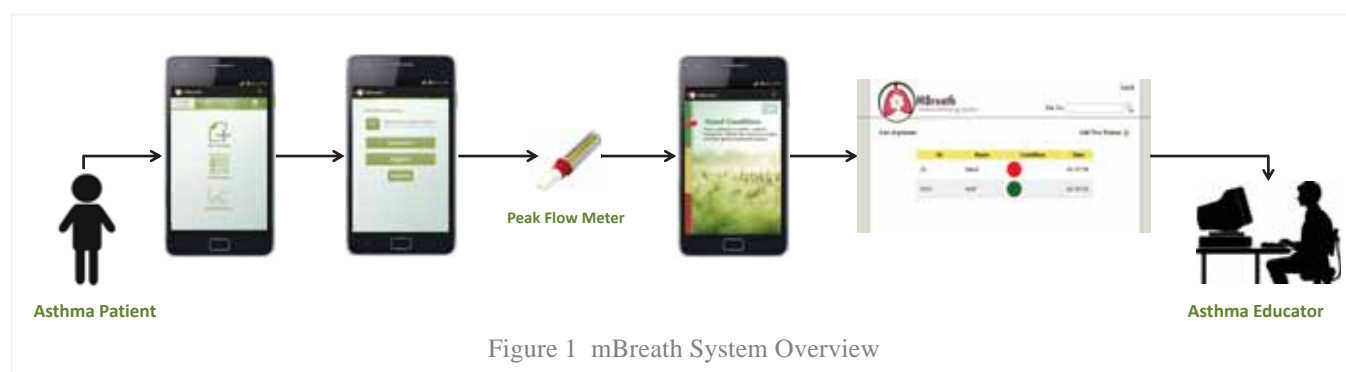
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ABSTRACT

As more of us live in air polluted areas, rates of asthma have dramatically increased. In Saudi Arabia, the rate of growth of this disease is very alarming with its prevalence exceeding 20 percent of the population.

Unfortunately, the traditional way of managing asthma is very limited because of the following reasons. Firstly, patients only monitor their illness during hospital visits; they lack the necessary knowledge to deal with asthma. Therefore, they end up having life threatening attacks. Secondly, doctors do not have a communication tool that allows them to keep track of their patients or evaluate their progress, they need a way that facilitates remote communication. Thirdly, the use of peak flow meter could be a problem if the patient is asked to write the peak flow meter readings, since this procedure is both inefficient and inaccurate. Fourthly, in regions like Saudi Arabia where weather could be a risk factor, patients are unaware of the upcoming sand storms, which could lead to devastating effects.

mBreath system was designed to address the above problems. mBreath supports two types of end users patient and medical staff. On one hand, asthma's patient is offered a smart phone application intends to monitor his asthma condition by receiving his peak flow readings from peak flow meter and then compares it with the normal peak flow reading. If the reading is within the patient's normal patterns, the application would simply record it, if less than normal condition, the application will notify the patient and remotely alert his doctor (via SMS) that this patient might be experiencing an asthma attack. Another feature is the weather alert which notifies patients before any sand storm. On the other hand, medical staff will be able to monitor hundreds of patients through a web-based interface. This technique allows medical staff to monitor their patients more effectively and thus rescue the patients much faster. A general diagram describing the overall system is illustrated in Figure 1.



mBreath has been successfully developed, and is envisioned to be a valuable system for asthma's patients, asthma educators, doctors, and the whole society. It will definitely raise the awareness of asthma and its implications by providing its users with a way of self-monitoring their disease. It plays a major role in case of emergencies (severe asthma attacks) since it assists both doctors (through SMS) and patients (through the personalized advice). mBreath establishes a powerful communication channel that links patients with their asthma educators; this strong connection is very helpful because asthma educators would be able to monitor patients' conditions and view their history in an easy manner. mBreath was tested at King Khaled University hospital to insure that it reflects the need of asthma patients in general and local patients in specific.

mBreath offers many contributions, it explores new trend in monitoring asthma by linking peak flow meter to the patient's mobile through Bluetooth technology. Moreover, mBreath is the first asthma monitoring system that supports Arabic.



I Can Communicate (ICC): to support stroke patients

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ABSTRACT

ICC is Intelligent system that supports android environment, It is going to be development of a software system falls in Augmentative And Alternative Communication (AAC) that aims to facilitate the communication and interact between *stroke* patients and nurse , automate the work and Procedures of nurse, to provide the best medical care for stroke patients and help them to overcome the disabilities, like problems of using or understanding language therefore cannot express his pains and feelings to medical staff, Paralysis or problems of controlling movement , Emotional disturbances problem .

ICC consists of three subsystems: ANDROID Smartphone in both patient and nurse side, and server contains intelligent databases implement by SQL MANAGEMENT SERVER,SQL SERVER.

The communication between patient and nurse through network using ASP.NET : TCP connection inside the hospital .but outside the hospital they will communicate through SMS To send subsequent appointments.

Figure1:ICC system structure.

In the server side implemented by using C# language to providing a lot of services: organize the communication by including assign and unassigned between tow clients (patient ,nurse) depending on the schedule of nurses work, then receive all the types of the requests from the patients and forward calls to the nurse who is in charge for the request , Can also monitor the performance of the nurses and the level of service provided , store all procedures in the database to extract information and statistics, the Server using MULTI-THREADING to serve more clients in the same time.

ICC provides several services to *stroke* patient including :the main function is TALKING PHOTO ALBUM STRATEGIES that organized medically approved pictures that express (complaints and pain - requests - personal data), so patient can alarm the nurse with them request needs remotely ,or if the medical staff near the patient can communicate with them by just reflects his case and needs through the pictures. Figure2:talking photo album .

Other services :remember the time and dosage of medicine, provide easy way to fill the form by using GRAPHICS (form contains daily questions),provide the sound service for each option , educational videos for exercises , send positive message to patient and Provide useful exercises using GRAPHICS then store the result of performance (exercises for the movement of the upper limbs).

on the other hand the nurse can follow up the patient by several services including notifies the nurse about the forms and requests that send from patient, and responsible for medicine time of Patients .

ICC uses several technologies and fined easy way to help *stroke* patients to overcome obstacles by using available devices. This system is a dynamic system so that It can help stroke patients to communicate with outer world and can be used with people who have similar problems to stroke patients.

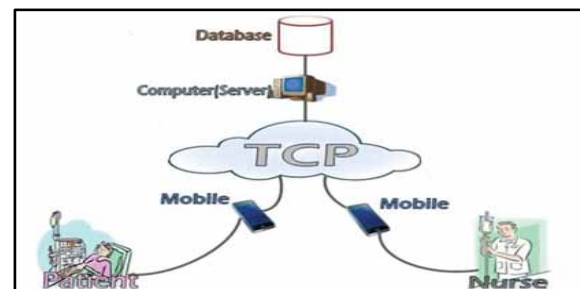


Figure1:ICC system structure



Figure2:talking photo album



Free E-pharmacy software application

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Dr. Osman Ibrahim

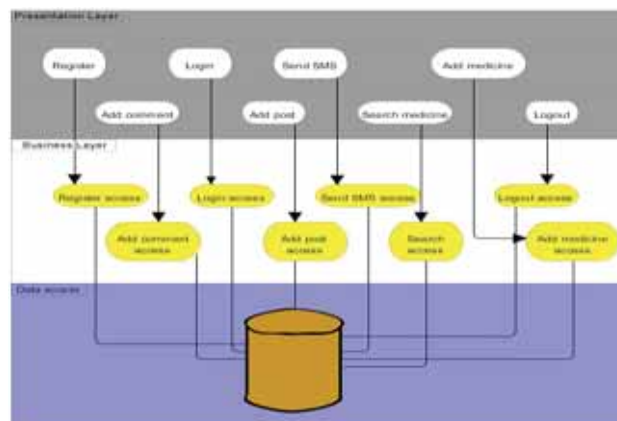
ABSTRACT

A lot of people nowadays are using a huge amount of medicines and others left their unused medicines until they are expired and threw them away. Some hospitals face problems in lack of medicine needed for their patients and they request from the NGOs and demand them to collect a certain amount of specific medicines. This problem leads to the death of many needy people.

Medicine prices rise sharply that hinder needy people from getting treatment especially for expensive medicines whose prices are beyond their capabilities. In the meantime huge amounts of medicines are daily disposed of and are left until expired and thrown away while many other people are in bad need for these medicine but they cannot pay for it.

I'm developing a software application that has both web and mobile interfaces. That application can be used by an NGO, government hospitals, or regular citizens to accumulate such medicines and distribute those to needy according to specific governing rules.

Distribution of the accumulated medicines may be physically from participating pharmacies, hospitals, and NGO stores. Alternatively, the distribution may be virtual using mobiles: an individual who has a medicine that is no longer needed, can send a structured SMS to the system to record this information automatically. Another needy individual who is in need for such a medicine may have posted his need earlier for this same medicine. If it happened that both individuals are in close neighborhood, the second person is directed through an SMS to the first person



This topic is important especially in Egypt because there are many people who cannot get their medical treatment and this application will help many of the needy to get their medicine either for free or with low prices.

In order to implement this application I'm using Android OS for the mobile based application, and J2EE for the web based application beside oracle MySQL for the database.

The application that will be executed on Android and web based platform that aims to be easy to be used by different types of people. So, if someone don't know how to use the internet or don't have a computer he can use the mobile based application in order to access it and otherwise. By applying this application in many places and countries it would help in reducing the percentage of poverty and lack of medicine in the poor countries. There are already some similar applications, for example the Egyptian bank of food which is specialized in fighting hunger through diversity and innovation by creating effective programs addressing Hunger Problems.

References:

- 15 pinherio. CP. 2008. Drug Donation: What lies Beneath. Bulletin of the World Health Organization.
- WHO Model List of Essential Medicines, 16th list. Geneva, World Health Organization, 2009. Available at: <http://www.who.int/medicines/publications/essentialmedicines/en/index.html>



Arabic Twitter Application

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ABSTRACT

In recent times, the use of social networking sites, such as Facebook and Twitter has spread dramatically. Twitter is an online social networking service and micro-blogging service that enables its users to send and read text-based posts of up to 140 characters, known as "tweets". Therefore, it became necessary to develop an Arabic Twitter Application for Arabic people who are not familiar with the English language. This possibility is the basic idea of "Arabic Twitter Application", where the application is intended to help Arabic people who are not familiar with the English. Each Arabic Twitter user will be able to have his/her own profile to allow him/her to have their own information.

The first problem in the original English twitter is twitter accessibility is limited to those who know some English because there is not an Arabic interface to twitter. And the second problem is some functions are missing in twitter application so we want to provide extra functions that does not implemented in other twitter applications.

Our project is "Arabic Twitter Application", is an Arabic interface to twitter with all twitter basic functions to allow more Arabic users. It connects to twitter server by using the twitter4j library for twitter API. And it will be an android application implemented using java language. For an overview scope of Arabic Twitter Application see Figure 1.1. The application has ANDROID version 4.0 with Google APIs which allows dealing with the API level is 14. We selected this version because it is the latest version that supports both mobile devices and tablets. We implemented the application by creating twitter Application using Twitter Developer website. Then design the interfaces using ADT plug-in and XML. After that we implemented the classes and methods using twitter4j library in the Eclipse environment.

The extra functions:

1. Mute:

While Twitter does not support mute, some other Twitter client provide this function. The idea behind the mute is basically muting a user's tweets without un-following them. Arabic Twitter user can manage his/her mute list by adding or removing users.



Figure 1.1: overview of Arabic Twitter Application

2. Arabic Twitter Reply:

It is a new version of reply that show who will read your reply as part of their timeline. Only people who follow you and follow me they can see our reply (interaction) as part of their timeline.

3. Watch list function:

The idea from this function is to watch (monitor) users who are interested to see his/her tweets or replies by adding them in watch list. Arabic Twitter user can manage his/her watch list by adding or removing users. Then Arabic Twitter Application alerts the user for any tweets or replies from watched users then display notification to his/her.

The main impact of our project:

The main impact of our project is increasing the amount of Arabic content on the internet which is limited recently. In addition building Arabic twitter application will help people who are not familiar with the English language like children and the elderly. And this will increase the Twitter accessibility which is limited to those who know some English. Also providing extra functions to Arabic Twitter Application does not implemented in other twitter applications will make it more effective and more powerful than other applications.



Smell-Based Searching Robot

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ABSTRACT

In our daily live we always want to protect ourselves, our lives, our community and sometime the universe from danger. Imagine how many people are dying because of toxic gases in their houses or in the laboratory, how the pollution is destroying the environment just because there is leaking in the pipes. Sometimes it is not possible for human to search or recognize an odor (gas) and find its location in a certain place because it is hard to make sure that place is safe for humans. In this case, a special kind of robots may accomplish the task.

The main challenges in using robots to search and localize odor sources are the reliability of data obtained from the odor sensors and the navigation strategy used to localize the odor source. Regarding the sensors, several researchers have studied the reliability of data produced by the sensors. Some of them have proposed new methods to extract reliable data form sensed data [1, 2]. Regarding the navigation strategy, new ones were proposed in literature based on some animal behavior [3, 4, 5].

In this project, a Lego Mindstorms NXT 2.0 robot is provided with an odor sensor and a navigation strategy such that it will behave like an animal to find the source of an odor. The odor sensor used in this project is the MCQ6 which can detect **write** a paragraph about the sensor. The sensor gives a reading in below 35 if there no odor detection, otherwise it gives a reading in the range [35,100] according to the distance from the odor source. Regarding the navigation strategy, two strategies were implemented. The first one is a random strategy which is used in the case where the sensor reading is below 35 and it moves the robot randomly in a specific region. The second one is the spiral strategy which is used in the case where the sensor reading is greater than 35 and it moves the robot in a spiral form until the odor source is located. Figure 1 shows the results of two experiments carried out using previous strategies. The experiments show that the robot can find the odor source efficiently.

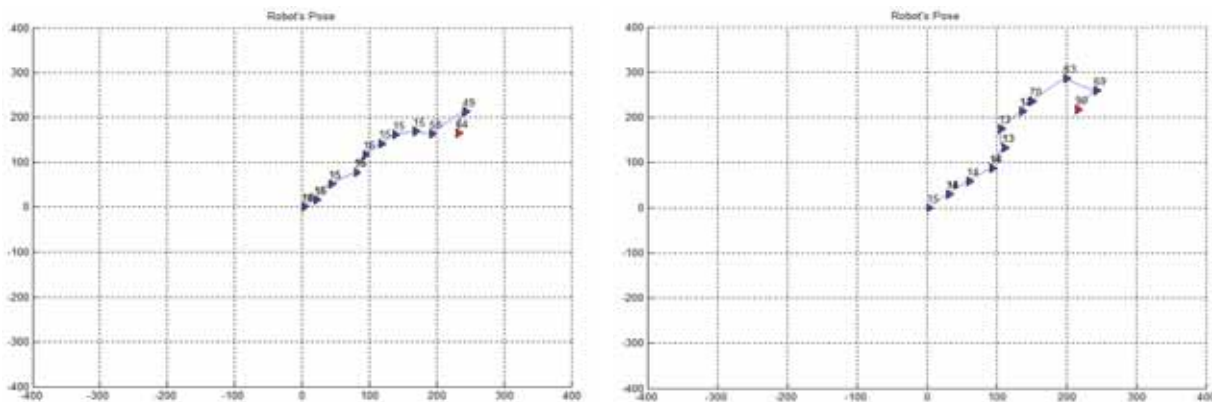


Figure 1. Two experiments to locate the source of an odor.

References

- [1] DZ. Liu, Odour Source Localization using Multiple Plume Tracing Mobile Robots, Ph.D. Thesis, School of Mechanical Engineering, The university of Adelaide, Australia, 2010
- [2] J-G. Li, Q-H. Meng, Y. Wang, and M. Zeng, Odor source localization using a mobile robot in outdoor airflow environments with a particle filter algorithm, *Autonomous Robots*, Vol. 30, Issue 3, pp. 281-292, 2011
- [3] A. Lilienthal, D. Reimann, and A. Zell, Gas Source Tracing with a Mobile Robot Using an Adapted Moth Strategy, in *Proceedings of Autonomous Mobile Systems*, pp. 150-160, 2003
- [4] G. Ferri, E. Caselli, V. Mattoli, A. Mondinib, B. Mazzolai, and P. Dario, SPIRAL: A novel biologically-inspired algorithm for gas/odor source localization in an indoor environment with no strong airflow, *Robotics and Autonomous Systems* Vol. 57, pp. 393-402, 2009
- [5] Q-H. Meng, W-X. Yang, Y. Wang, F. Li, and M. Zeng, Adapting an Ant Colony Metaphor for Multi-Robot Chemical Plume Tracing, *Sensors*, vol. 12, pp. 4737-4763, 2012.



An Automatic Associated Diseases Identification Application

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ABSTRACT

Important data is usually kept in databases and data warehouses, but as the database grows it becomes significantly difficult to study and explore. One of the domains that cannot function effectively without databases is the medical facilities. They keep critical data and construct important studies that can literally save lives. However, due to the huge database size, this can be a time consuming process that would probably take much human resources. What if there is an easy way to study and analyze huge data? discover only the interesting knowledge? what if this can be done automatically in a matter of seconds?

This is achievable with the help of technology combined with a data mining approach, it can help to analyze data and discover useful information. Hence, we got inspired to implement an application that can serve medical professionals and is based on data mining approaches so it can automatically discover useful information in datasets. Our tool aims to work on patients' data and find out the frequent patterns of diseases then conclude some rules that associate disease A with some other disease B based on how frequent they usually occur together. The application can serve as an analytical tool when used on huge data files, such as patients records, by discovering and presenting only the interesting relations between diseases that can be found in the database.

For the sake of this application, we focused on identifying associations and frequent patterns on a specific set of diseases: Stroke, heart failure, pulmonary insufficiency, intermittent claudication, atherosclerosis, renal failure, obesity, diabetes and hypertension. The application gives the flexibility of updating the dataset by adding new patients' information.

In our tool, we applied one of the most popular data mining techniques: association rules based on frequent patterns using Apriori Algorithm. The code is developed with an object oriented programming style (java). The basic element is the class patient, which saves a list of diseases infecting a patient. The second class is the combination generator, which generates all possible combinations of diseases. The application can present combinations at different levels based on the user's parameters. It can be a combination of two up to the maximum number of distinct diseases in the dataset. The tool presents the interesting association rules (i.e. the rules satisfying minimum support determined by users).

This application is useful in domains that are in need for data analysis and knowledge discovery in large datasets. For example, doctors can use it to reveal rules associating diseases together. Then they can use these rules to predict what are the diseases that would arise in the patient's future. It can also be useful in studying the most common diseases in a society and constructing a treatment plan accordingly. Thus it will be very useful for studying and researching purposes.

We presented the idea to some doctors and they suggested some enhancements that we hope to encounter in our future work, we hope to implement more user friendly interfaces, also to expand the work to cover more diseases and larger datasets.



Figure1 shows system a high level view of the system implementation .



Figure2 system output.



TwtrR: Twitter Recommendation Tool, using concept mining

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ABSTRACT

Twitter is an online social network service that enables its users to send and read text-based posts up to 140 characters, known as "tweets". It also allows its users to update their status, to share their photos, to follow and to be followed by other accounts (users).

Becoming more popular, Twitter gains more users each day. As a result, users often face the challenge of finding the right people to follow based on their preferences. Therefore, Twitter has started a new feature that's called 'Similar To You' which can be found on every user's home page, profile page, and other users' profile pages.

This feature obviously suggests to users who to follow. The suggestion is based on recommending the followers of your followers whom you don't currently follow. (Supposing that A,B and C are Twitter accounts. If A follows B, and B follows C, and if A isn't following C this feature will recommend C to be followed by A).

For those who simply use Twitter to connect with already known friends and share news, this feature will encourage more people to join and follow one another.

On the other hand, the provided feature won't be accurate for those who are looking for accounts that share their interests and hobbies because, as mentioned above, it is based on followers of followers only and not interests, lifestyles and hobbies.

This has inspired us to come up with a tool that will help Twitter users to find each other based on shared interests, ideas, football favorite teams, political views and much more. In other words, the object of this tool is to improve Twitter Recommendation Feature to consider general thoughts when suggesting the following. The target of this tool is any Twitter user who wants to find other users based on shared thoughts.

TwtrR- is an independent website that modifies the twitter recommendation feature. The recommendation system provides similar accounts to the user by accessing users profiles to perform analysis and mining the contents of users' tweets (that are written in a proper English language) to recommend accounts depending on their similar thoughts and interests.



[Figure 1 'Similar To You' feature of twitter]

The following techniques were considered in the design and development of TwtrR:

- Concept mining: a process that focuses on extracting ideas and concepts found in users' tweets. We have chosen GATE tool to work on this part of the project because it is "an open source software capable of solving almost any text processing problem."^[1]
- Lexical database of English language will help us to provide users accounts with shared thoughts. We have chosen WordNet because it is "a large lexical database of English. Nouns, verbs, adjectives and adverbs are grouped into sets of cognitive synonyms (synsets), each expressing a distinct concept."^[2]
- Twitter API: Twitter Application Programming Interface allows our tool to be authenticated by twitter, and to get profile account's information (as user ID, screen name, following accounts, and tweets)
- K-means clustering algorithm

TwtrR tool will save the users' time and effort spent on searching for equivalents of twitter users by introducing accounts with similar thoughts. Shortly, this tool aims to improve the precision of "Who to Follow" Twitter recommendation tool.

References: 1- <http://gate.ac.uk/> 2- <http://wordnet.princeton.edu/>



Learner-Centered Technologies: A Shift from Traditional Books to iBooks

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ABSTRACT

We have completed our iBook initiative for the foundation year students for the English department at Sharjah Women's College. The project fulfilled an educational mission regarding motivating students to study and learn interactively with teachers. The iBook project involved the transference of a stream of information found in textbox shifted into digital data format that involves interactive user input. This study involved a collaboration with three students in a higher educational environment. We embedded and tailored the functions available on iBook Author into our study. This approach works easily especially if we already have parts of the book drafted in another software such as text in Microsoft Word, PDF or images in Adobe Photoshop.

The current challenges within a higher educational environment is that technology is continually evolving, hence making it a key factor towards building a Creative Learning Environment. This study reports on an ongoing project in the Sharjah Women's College and explores some of the challenges prompted mainly through the reliance on Legacy Systems during a learner-teacher class room environment. Some of the findings reported in this study, is that dealing with learner motivations and learner performance could be improved through learner-centered technology. The study proposes an interactive iBook system using the iBook Author Software. This study involved collaboration with learners in a higher educational institution where we embedded and tailored the functions available on iBook Author Software into a specific study. The iBook Author Software allowed us to engage a mixture of built-in multimedia elements which were helpful functionalities and which increased the knowledge of students' teacher-learner interaction. Additionally, the usage of widgets in the iBook to create an email window that allow students to contact the teachers have had a major benefit in the way students increase their knowledge. The existing legacy systems employed at the university were lacking the integrated functionalities and additional resources required for learning.

The iBook Author Software gave the project the possibility to enhance the deliverable and the expected iBook. This study achieved an interactive iBook that allows students to input answers and receive back an immediate feedback from the teacher. One of the many benefits the iBook carries is that it offers a correction of the wrong answers therefore students can recognize their mistake immediately. The iBook encourages self-study where students can work independently therefore students can explore more areas of their personalities. The iBook can fulfill reducing wastage of papers and less demand on printers' usage. This study enable teachers and students to access and transfer the iBook easily through multiple platforms. Additionally, students will shift toward using the latest technology at the college which will evolve the way students think, act and learn. The iBook is a compelling experience that has beneficial factors for the students' academic career. We have completed our project successfully and students at the college are using the iBook for day-to-day practice or exam revisions.



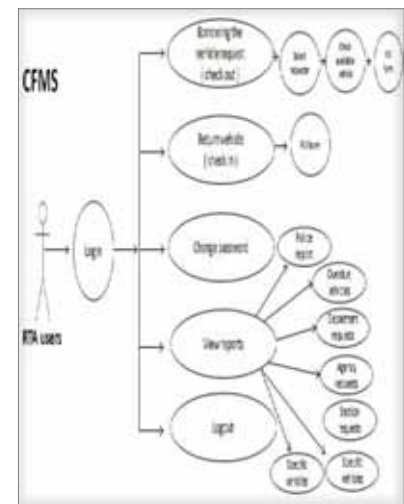
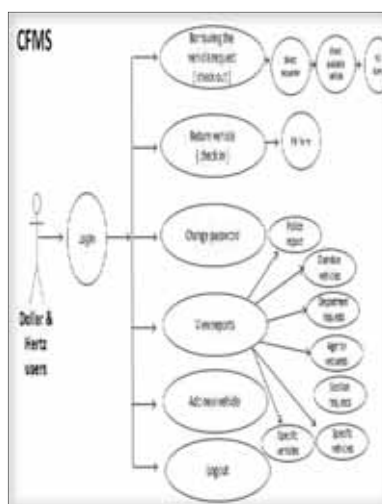
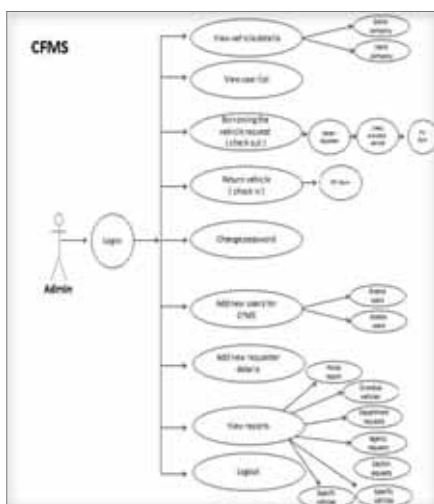
Car Fleet Management System (CFMS) For Road Transport Authority in Dubai

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ABSTRACT

The main challenge for users is the abundance of information that is becoming available and the need to access and represent information in a more structured and meaningful way. Dubai's RTA's (Road Transport Authority) deals with highly sensitive and data security is needed to be effective. RTA is also dependent on vendors to provide reports and monitor vehicle information. This study presents an ongoing research on the design of a Car Fleet Management System (CFMS) in Dubai's RTA's (Road Transport Authority). The integration, representation and automation of information is vital nowadays, even in public sector organizations. The aim of CFMS was to improve monitoring, availability and computation of the vehicles in- and out-processes internally rather than relying on the service provider. This study comprises a qualitative case-study that involved interviews with middle managers and end-users in the RTA Administration department who have responsibilities of recording the borrowing of cars. CFMS was piloted in two separate case organizations Dollars and Hertz car rental in Dubai (UAE). CFMS was made available on the RTA for specified end-users to access, use and view information in the system. The objective of this study is to deliver and automate the CFMS and keep cars fleet movement records hosted internally at RTA rather than relying on service providers. The findings show that CFMS for Dubai RTA helped to reduce-time, access and increase the representation of information to process the number of tracking and recording of vehicles, thus subsequently enabled RTA end-users to become more efficient in their working environment. The CFMS is created using ASP.NET coding language where we designed and added several key features and functionalities. For example, an admin using CFMS can view the information of rented vehicles from Dollar and Hertz, while users will be able to add and delete vehicle records. In addition, admin users will be able to add a new user for the system and enable or disable a user from using the CFMS or requester who can request a vehicle. In addition, admin-users can view a user's list and update key information including Check-In and Check-Out features where users can enter request details. Because of the large volume of data CFMS provides a search feature to view available vehicles. In term of security, users are required to login into CFMS and change their password. Moreover, the proposed system allows the uploading of police reports in which users can load the report to the system and save it to a database. In addition, to ASP.NET, we compiled Java-Script to help add more functions that couldn't be added on ASP.NET. SQL Server was used to store and retrieve the data in a structured and meaningful way enabling information about the vehicles to be retrieved as a report. CFMS allow users to generate six types of reports. List of requests that has been required from specific agency, department or section. The user of the system can generate a report for specific requester for a specific vehicle by entering requester-ID or plate number in the search area. In addition, they can generate report of overdue cars and report about all accident report that has been uploaded in CFMS.

* Appendix shown case diagram of CFMS





Alzheimer's Disease Patient Assist

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ABSTRACT

Alzheimer's is a type of dementia that causes problems with Memory, thinking and behavior (actions). Symptoms usually develop gradually and get more intense over time, becoming serious enough to intervene with everyday activities.

Alzheimer's is a disease it's not a part of getting older, although the biggest known risk aspect are older ages, and the majority with Alzheimer's disease are 65 and older.

Dementia usually first seems to be forgetting usually. They are often conscious of the loss of memory.

The early symptoms signs of AD can include:

- Difficulty performing tasks that takes some thinking, but used to come easily, such as controlling a checkbook, playing complicated games (such as bridge), and studying new information or routines
- Getting lost on known routes
- Language issues, such as problems discovering the name of known objects
- Losing attention or interest in things previously enjoyed, flat mood
- Misplacing items

As the AD becomes worse, symptoms are more obvious and they will interfere with your ability to take care of yourself.

The Mobile Application that we are developing is to target only the early or mild stage of the AD. The application is going to automate the patients activities throughout the day so that he will have no need of any other kind of assist . The stages after that are hard to work on since they need special care from a medical individual. The symptoms mentioned earlier are being studied to come out with the most efficient solution. Seniors at this early age might not be very trusting of a person taking care of them from outside the family.

Features in the application:

- An Alarm that helps the patient remember his medication.
- Gps Locator; if patient exceeds a certain range, the application will remind patient to call his son for example, but if that call wasn't established the coordinates of the patient will be sent automatically to the desired phone number
- Recording people; is to record a video of 3-6 seconds for newly known people with only name and profession to help patient with remembering these people
- Entertainment : Google Books (Text to Speech), Radio, Photo Gallery
- Memory Games that help with training patient's memory

The Application will be set up exclusively for each patient when the one responsible for him downloads it. Big texts and photos and sound guider for exploring the application will be adjustable in settings page. There will be a very simple icon set for the senior to handle; since the procedural memory is going to be weak.



Android-based Application for Radiation Evasion in Nuclear Facilities

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ABSTRACT

In a Nuclear facility, radiation leakage represents harmful rays to human, As we know radiation is invisible, everybody know how much does the radiation harmful. Workers in a nuclear facility must know if there is any Evasion to avoid the hurts that may happen to them.

Android-based Application for Radiation Evasion in Nuclear Facilities aims to help the employees if there is any Evasion , This application will alert and helping them to determine the safest and shortest path (Exit). Our system is contains from: wireless sensors, server, and android device.

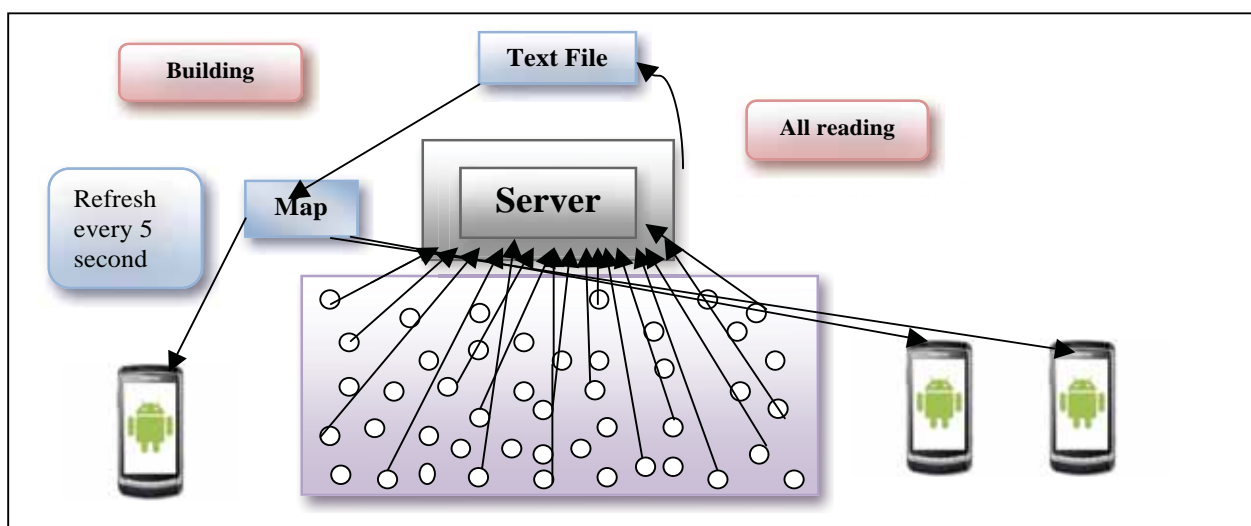
The wireless sensors is programmed in language (NesC) and it will check if there is any evasion and send data to the server .

The Server is connected to all mobile devices to send the values that have been taken by sensors. the map will be drawn on the android device based on the data generated from the server every 5 seconds the map will be updated, If there is an evasion the data will be different so the shape of the map will be different too.

The application will alert all the employees (who have android device). the employee will check the map that will be drawn on the mobile according to the values that comes from server the shortest path will be calculated and the safest exit will be known. Algorithm would yield navigation paths that would guide occupational workers towards nearest exit points safest path doesn't mean always shortest path it means the path that far away from the evasion . The location of each employee will be tracked based on app/server program that is installed at both ends.

To avoid the Scenario of more than one employee near the same safest exit the data from the server will not be sent concurrently, and by default the building exits will be large, if there is any traffic on one exit we can put a camera that connected to the same server to count the number of the employees and send it to the employees. In this way he can choose another safe path.

The safety of the employee is our goal and by using this application we will encourage the employee to work in the Nuclear facility, as we know how much the nuclear power will be useful.





Design and Implementation of a Brain Computer Interface System: Speller Application

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Supervised by:
Professor Maamar Bettayeb

ABSTRACT

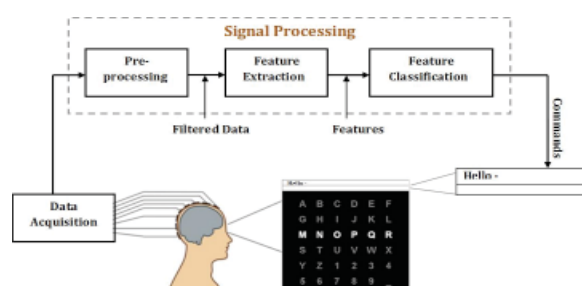
Communication is the way that human beings interactively interact with the external world, express their feelings, and unleash their ideas. The most used form of communication in our everyday life is the verbal communication. Deaf and dumb people, however, use non-verbal communication in the form of sign language using hand gestures.

Nevertheless, some people who suffer from severe disabilities and incurable diseases such as Amyotrophic Lateral Sclerosis (ALS) are deprived of the blessing of communication. In such diseases, the delicate line between thoughts and actions is broken and therefore patients lose the ability to control their arms, legs, facial muscles, and even tongue muscles. This implies that their communication capabilities like speaking, writing or gesturing might be totally lost. The disease, however, does not affect intellectual or sensory functions. Patients can still see, hear, and understand what is happening around them, but they cannot consequently respond and control their muscles. Then, any type of therapy will be useless to retrieve patients abilities; neither medicine nor surgery. Utilizing signals produced by patients' brains can be an efficient way to interface them to the external world.

An effective way of using brain electrical signals is to translate them into communication and command signals to control systems and devices that those patients need, like wheelchairs, robotic arms or word spellers. Such systems are called non-muscular systems, since they are controlled only by brain signals and don't require any muscular activity.

A brain computer interface (BCI) is considered to be a communication/control system that allows communication between the human brain and external devices. BCI does not depend on any muscular activity as input from the human, but instead takes his/her brain signals and translates them into device commands that reflects the user intent.

In our project, we aim to give totally paralyzed people an opportunity to have a good quality of life and enable them to communicate with others, by designing and implementing a system known as BCI speller. A speller is basically a BCI system that employs brain signals to enable patients to spell characters by displaying them on a screen. We plan to overcome the challenge of finding the most suitable type of brain signals to be used and the most efficient methods to process them. We explore the stages of implementing a BCI speller based on a certain brain signal called P300. The methodology taken for the project is as follows: The signals are acquired through electrodes, processed in a way to reflect the intent of the user, and then translated into device commands, to show the desired letters on a computer display. Many speller systems were implemented using different BCI hardware & software packages, and signal processing techniques. A Chinese group implemented an auditory P300 speller and used the Support Vector Machine technique for classification that allowed them to attain 85% accuracy. Another Italian group implemented a hybrid speller that makes use of two types of brain signals: P300 & motor imagery. However, in our project, we aim to have a complete design and implementation for a non-invasive BCI P300-speller system that is able to efficiently process the brain signals. Efficient processing includes finding methods to: perfectly enhance the brain signals (pre-processing), extract representative features (feature extraction), and classify them accurately (feature classification). After conducting in-depth research, it was found that using the following techniques will assure a reliable and accurate performance: Principal Component Analysis & Independent Component Analysis for **pre-processing**, Wavelet transform or Peak picking & Area calculation for **feature extraction**, Linear Discriminant Analysis or threshold detector for **feature classification**. The contribution of this project is to improve the efficiency of the P300 speller by implementing the most efficient algorithms in each of the processing stages mentioned above. The target group of the project is obviously people who severely suffer from total disabilities that impede them from communicating via the normal methods: speaking, writing, or gesturing.





Beat Echo: Music Recognition by Echoprint

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ABSTRACT

Music recognition performs an important part in creating automatic listing and data source recovery programs. There has been a lot of work done to improve and enhance the accuracy of music recognition. Echoprint open source facilitated and allowed developers to work towards improving music recognition accuracy. The main objective of the entire project is to create software on a specific platform that is able to do real time music recognition and compare identified piece of music against a database to retrieve the available information about the recognized piece itself such as the artist name, album name, genre, release date and many other essential information for the song to be correctly sorted in any music library for any user to use.

The solution presented is a software called Beat Echo capable of recognizing music whether stored on the processing device or played from an external. In order to achieve fast recognition and ease of accessibility, the application will be an Android OS Application. Android operating system abilities an incredible number of cellular phone gadgets in more than 190 countries all over the globe. It is the biggest set up base of any cellular foundation and growing fast every day another million customer power up their Android operating system gadgets for the first time and start looking for applications, activities, and other digital content. One of the major advantages of android operating system is led by Google Company.

Beat Echo employed Echoprint software. Echoprint is an open source and open data music identification service. it is efficient and rapid and works by creating multitude of hashes a second from input audio or music and then relate those hashes in an extensive catalog for queries. fingerprinting is the methodology used in the comparison process because each music file has its own fingerprint just like a human being. The best part of this technology is that it works online to fix and maintain the users music libraries compared to the already created database found on their cloud internet storage and servers to save lots of bandwidth as any implemented software should have millions of users around the planet to use the same technology throughout various of application that already existed and those to be created.

Beat Echo manages the user's personal music data on his/her device. Beat Echo provides the following functions :1-sound to wave form conversion. 2- locating the music's file if available based on 5 to 10 seconds samples and it depends on the original wave quality and retrieving the data to the processing device, meaning the more clear the sound it is, the more accurate the results will be. 3- correct audio tags of music files stored on the processing device (automated process authorized by the user). 4- tell the user if the recognized music (from external sources) is already stored on the processing device so the user will not have to download the music.



Embedding content management system in an Alumni Information System

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ABSTRACT

The Alumni Information System (AIS) is a career services for alumni, the system will open new prospects for the alumni to prove their merit and put what they have learned into practice. AIS is a web-based system consists of online accounts for graduate students, companies that collaborate with the university, and the alumni college committee. Several users with different roles will interact with the system. For example, registered companies post jobs on the website, search for candidates and contact them; other not registered companies contact the alumni committee to post their open vacancies.

The alumni college committee manages the website and gives access to trusted companies who would like to collaborate with the university. Students about to graduate will be contacted by the system to open accounts and create their profile. The graduate students will be able to update their information and Curriculum vita CVs. Once the graduate finds the desired job in the announcement, she will communicate with the company to apply for the job. The Figure below shows the system communication between graduated students, the university and companies.

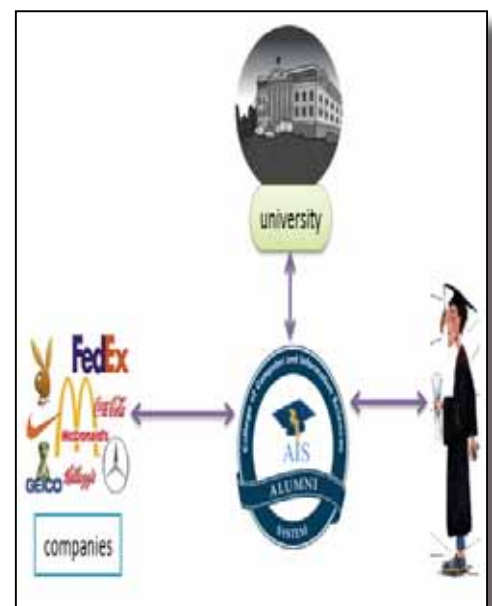
Our system make use of content management system (CMS) called DotNetNuke[1] which is a set of procedures and practices for managing documents in collaborative environment. We used DotNetNuke provided modules and we implemented our special modules using VS (Visual Studio) Express for Web and ASP.Net language to achieve all system requirements which they are: Manage Events modules, Manage Jobs modules, Advanced Job Search module, and Registration modules. Then, we integrated all modules together and test them after integration.

There are many modules provided by DotNetNuke. We used some of them in our system. For example Member Directory module help with companies search; Announcements module helps with adding new announcements in the site. Registration module makes the registration process more secure. DotNetNuke is very helpful for the admin; it will help her to manage all the registered users easily.

The local & global impact of developing this system:

- Reduce the time and effort of the alumni looking for a job.
- Help Computer and Information Science College (CCIS) at King Saud University keeps in touch with its alumni.
- Keep the alumni update with the latest events and conferences, developments and the graduates meetings in the university.
- Encourage the companies to offer their jobs via our system.

AIS system allows the graduates after they employed to remain in touch with the university. It also, helps the KSU-graduates to find job, search for a new job, or move to different place. The aim of AIS system is to be the core point of contact between the alumni and the college, in addition, to establish the strong relationship with local industry and the graduates.



Reference:

1. "What is DotNetNuke?" [Online]. Available: <http://www.dotnetnuke.com/Intro/At-A-Glance.aspx> [Accessed: Nov. 23, 2012].



Combined Watermarking Algorithm Based on DCT and Hash Functions for Color Satellite Images

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ABSTRACT

Many algorithms have been developed by different organizations such as EIAST (Dubai Sat) in order to protect the copyright of their satellite images. Most of these algorithms work in the transformed domain and they are robust against different types of attacks. This paper deals with a combined watermarking scheme for color satellite images. The new algorithm embeds two watermarks in the image for copyright protection and for checking the authenticity of the image. The first watermark must be robust against intentional and non intentional attacks. The second watermark will be a fragile watermark and will be used to detect any modifications or tampering in the satellite image. The first watermark is done in the frequency domain using the discrete cosine transform (DCT) while the second watermark is embedded in the spatial domain. The algorithm is blind and the embedded information can be extracted without using the original image.

The first watermark is 16-digit number. The number is converted into binary format by using 4bit binary coded decimal (BCD) code and the size of the watermark will be 64 bit. The data will be embedded in the green channel of the satellite image. The green channel is converted into blocks of 8x8 pixels and each block is converted into the frequency domain by using the two dimensional DCT. The different blocks are screened to find the low frequency component with the highest level. This component will be used for embedding the data. The embedding is done by using the odd/even process. The block is then converted back to the spatial domain. The process is repeated with the other blocks. A scaling factor is used to control the strength of the watermark. Increasing the scaling factor will improve the robustness of the watermark however, it will increase the distortion caused to the satellite image. Therefore a compromise scaling factor is used which will insure that the distortion is invisible while maintaining adequate robustness. The watermarking data is smaller than the size of the satellite image and therefore it can be repeated several times. The shuffling process will be used to protect the data from vertical cropping.

The second fragile watermark is embedded in the spatial domain and it consists of a hash function using MD5 and Hex formats. The watermark must be embedded into the three different RGB channels. One row of each RGB channel will be used for embedding. The hash function of the other rows will be calculated and encrypted by a four digit decimal key. Then the encrypted data are embedded in the selected row. The data is embedded embed in the least significant bit of the pixels in the row. The attacker will not be able to alter the image and insert the new hash function because of the encryption process.

The extraction process starts first by detecting the fragile watermark. The color image is separated into three layers (RGB). In each layer, the encrypted data is extracted from the LSB of the pixels in the selected row. The data is decrypted to get the hash function. The hash function of the other rows is calculated and then the two functions are compared. If they are the same in the three layers then the image is authentic otherwise it is not. The copyright watermark is extracted by separating the green channel from the color image. The green channel is divided into 8x8 blocks and then each block is transformed into the frequency domain by using the DCT. The selected frequency component is tested for even and odd and the binary digits are extracted. The binary digits are converted into 16 decimal digits. Several versions of the watermark will be extracted and averaged.

The distortion caused to the satellite image is assessed by using the peak signal to noise ratio (PSNR) and the structure similarity index measure (SSIM). Most of the distortion is caused by the robust watermark while the fragile one causes minimal distortion. The distortion is invisible and good PSNR and SSIM are achieved. The new watermarking scheme is tested successfully on a variety of satellite images captured by Dubai Sat 1. The watermarked images are subjected to modifications and it was found that the fragile watermark is sensitive to the slightest alteration to any channel of the color image. The copyright watermark is robust and survived many attacks such as JPEG compression and filtering.



The effects of classroom flip on the student learning experience: An investigative study in UAE classrooms

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ABSTRACT

The rapid leaps and advancements in technology have given rise to an increased use of technology in classrooms of UAE based schools, colleges and Universities. The classroom flip is a switch in the traditional teaching pedagogy wherein the students can listen to or watch the lecture at home and they do the homework within the classroom in presence of the faculty. This recommends a 360° change to the current teaching practices where lecture is at school and homework is at home. Some of the colleges and universities in the UAE have started using flipped classroom.

Progresses in educational technology have resulted in cutting-edge pedagogical revolution, such as Courseware Management Systems (CMS), Intelligent Tutoring Systems (ITS) etc. Higher Colleges of Technology (HCT), Zayed University and Hamdan bin Mohammed e-University are making maximum use of technology in the class rooms and are motivating students to take online classes or participate in online discussions with peer groups and faculty. A blended learning methodology can be used with the help of videos, wherein faculty can shoot lecture videos and share them with students through network or by uploading them to YouTube. Students can then be directed to view these videos at home and try to understand the concepts delivered digitally. Faculty can then help students in classrooms to solve projects and problems based on their learning.

The researchers are aiming to distinguish between the preferences of the classroom style by having a comparative study of the traditional and flip classrooms. They hope to create an investigative study framework to examine learning activities in classroom using flipped classroom. The methodology chosen for collecting the data is by using secondary and primary data. Extensive literature review would be done to study the findings of research related to flip classrooms. Research indicators pertaining to success or failure of flipped class initiatives would be collected. Questionnaires would be built using the research indicators and data would be collected from students and faculty who have experienced the flipped classroom. The data will be tabulated and analyzed using statistical methods. Research findings would then be formulated using discussions. The results of the research should be very beneficial for universities and colleges to recognize the learning preferences of the students. This may help them to consider the use of latest technologies to provide students with blended learning experience. On basis of the findings of this research, academicians could consider different options of using the technology to provide a better learning environment by effective utilization of technology to implement the concept of the flipped class.



Effective use of iPad in Mathematics classrooms: An Investigation in the UAE

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ABSTRACT

UAE is one of the developing countries in the world that introduced technology in the education field later in comparison to other developed countries. However, UAE has used the technology effectively to enhance teaching and learning in their different educational institutions. One of the latest technologies that have been introduced in our schools and colleges is utilizing iPad in the classrooms. As quoted from The Gulf News (Feb 2013), this step came when H.H Sheikh Mohammed Bin Rashid Al Maktoum launched the iPad initiative project in the country in April 2012, after which an initiative was taken to implement iPad in 16 schools throughout the country in September 2012. The research paper aims to investigate the effectiveness of use of iPad in mathematics classrooms. It will not only focus on verifying the usefulness of the use of iPad in classrooms, but also aims to propose strategies and techniques to gain maximum advantage from implementation of this technology in our mathematics classrooms.

We believe that iPad has become one of the important technological gadgets for the youngsters nowadays. It has made a huge impact on the youth, and hence it can potentially be a good idea to adopt it academically. Moreover, iPad may provide a platform for both teachers and students that could exploit many educational opportunities for them which the traditional classrooms may not be able to achieve.

As any other educational technology, iPad has specific drivers and barriers in its use in academic settings. Numerous studies and investigations have been conducted worldwide by other researchers which examined the cons and pros of using iPad in classrooms. Similar Studies and research papers by some researches worldwide such as Katie Smieja from Bemdidji State University in USA and Brand and Kinash from Bond University in Sydney will be used as references for our paper. Factors pertaining to benefits and limitations of iPad use in mathematics classroom would be identified through such literature review based desk studies. These inputs would be used to construct a survey instrument, aimed to evaluate the opportunities from introducing the iPad. This investigation will include a sample of schools and universities that have implemented the iPad as a tool to utilize more innovative teaching and learning techniques. Students and faculty from such classrooms would be included in a questionnaire survey in order to obtain their feedback about this pioneering technique. The primary data collected by this process would further be statistically analyzed.

The findings of this research paper should help the institutes and teachers to consider the different and innovative ways in which they can use the iPad in the mathematics classrooms effectively. Using the research findings, Universities may be able to develop creative pedagogical strategies to implement iPad in their classrooms.



Masar: Pilgrims Healthcare Tracking System

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ABSTRACT

In 2012, the total number of pilgrims reached around 3 million. During the Hajj period, pilgrims tend to visit several holy places at certain times for a short period of time. This means, for those who require medical care during this period, treatment might be delivered to them by multiple healthcare providers at distributed healthcare organizations. Whether their medical condition is serious or minor, it is essential to have a mechanism to track their treatment history across the multiple organizations and manage the huge amount of clinical data. This is to achieve connectivity and efficiency, ensures safer and more convenient continuation of care and supports healthcare providers to make informed decisions. The Saudi Arabian Ministry of Health (MoH) is currently developing an Electronic Health Record (EHR) system customized to meet pilgrims' needs, and aims to adopt workflow support as a future stage. In this project we propose how workflow technology could be used to support and manage pilgrim's treatment flow.

Masar is a web-based application that helps improve the provision of pilgrims' medical care during Hajj. It automates the treatment flow, task assignment, and highlights any conflict. In terms of information provision, the system shows the medical history, treatment progress, medications, and involved users. In addition, the workflow system constructs an independent layer that connects the distributed infirmaries systems and databases so that the different health organizations, in the areas where the Hajj is being held, could keep up with the patient's progress from one visit to another.

The Workflow technology involves three elements: Process Designer, Workflow Engine, and Workflow Database. The workflow engine manages and executes modeled processes, and stores its related progress information in its database. While modeling a process, the different treatment stages are represented through webpages, automated stages, or prompts. Users or roles responsible for each stage are represented and therefore tasks will be assigned accordingly. Webpages, automated stages, and prompts usually need to be coded as required.

In terms of implementation of this project, IBM Business Process Manager (BPM) tool was used, which is based on Workflow technology. IBM BPM provides a process designer to model the treatment guidelines in which a generic treatment flow was modeled. This logic was then automatically maintained and represented in a web application. The interface throughout the treatment flow was designed and customized according to meet different users' needs as they interact with the patient. These interact with a database created to store patients' clinical information. The intended users of this system are the healthcare providers (i.e. Doctors and Nurses), Receptionists, and Administrators. With this interface, healthcare providers are able to easily register, store, and retrieve pilgrims' clinical information.

Masar helps users maintain this huge amount of information and avoid redundant work. Through web interfaces, clinical information may be retrieved anywhere. This allows connectivity and therefore facilitates seamless teamwork activities among healthcare providers. This enables healthcare provision to be tailored to meet patients' needs. Masar complements the MoH's currently developed system by extending the functionalities it provides.

Masar is currently under development and the results so far are very promising. This project aims to extend the functionalities of the Hajj system used by the MoH to better serve pilgrims during Hajj.



CAL: An Application for locating car and ATM using GPS/LBS Via mobile phone

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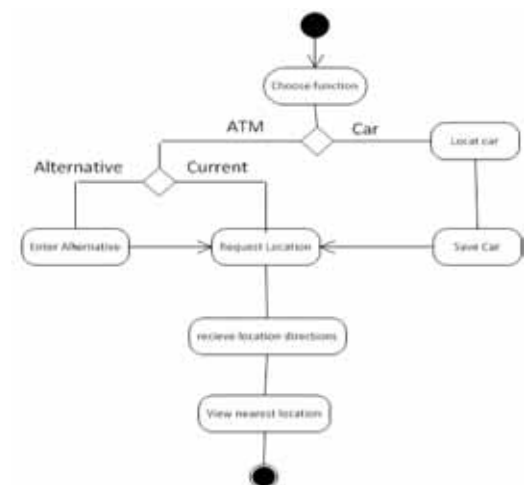
ABSTRACT

Nowadays, large and similar parking lots are causing some issues that many people are finding it hard to locate their cars. In addition, some people find it difficult to locate a near ATM or to know if there is an ATM at the place they are going to. CAL system developed to help people to locate their cars or to find a near ATM. CAL is a mobile-based application that designed to serve users across the world by reducing the search time for a car or ATM.



This project proposes the CAL application to operate on Windows powered mobile phones. This application will help users by assigning their vehicles to the application, and providing the ability to locate them at anytime and anywhere. CAL uses GPS/LBS techniques to locate the car's position. CAL is a global application, which mean wherever you go you can use it. Moreover, there is an ATM locator function within the application, which locates the nearest ATM based on the user's current location, or any chosen location.

CAL application user can be choose between tow functions, the first one is (Car) which means help to locate his car, and later he can back to his car by the direction which displays on mobile screen, the second one is (ATM) which divided into subsection, one of them was (Current) which means the request ATMs location surrounded user position then he can view nearest ATM location on screen map, the other subsection of ATM was (Alternative) which enable user to enter alternative location name and then display available ATMs direction there on that location. The figure Activity diagram demonstrates these activities and provides an explanation of this scenario.



The main purpose of creating the CAL application is to save time and searching effort. CAL application tends to be an easy application that anyone and everyone can use it without difficulties. The ATM finder function aims to find the nearest ATM where you stand, which can save some time looking for one. ATM finder function also aims to find the nearest ATM for a place you want to go, not necessary you are in that place.

CAL application will be working easily; the user will be able to select either the Car, or ATM service. The car option will provide the user with the ability to locate, and save their car's location. Once the user wishes to return to their car, they will be able to do by clicking a "Find my Car" function. Following this selection, the user will be provided with a map displaying the location of their car. On the other hand, the option to select ATM will provide the user with two functions. The first function is Current Location, and the second is Alternative Location. If the user selects Current Location, all the ATMs in the area will be displayed on the screen. Selecting Alternative Locations will show the ATMs in the desired location.

What makes CAL application special and different from other locating applications is that CAL combines between the car and ATM finder in one place and the new feature alternative location finder for ATMs. In addition, CAL will be running on windows devices, which means new market to publish our work.



Applied Computing In Solar Power Generation System

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ABSTRACT

The project combines wireless technology along with computing capabilities to design and implement a wirelessly-controlled, self-sustained solar power generation system, as shown in Fig. 1. The system is composed of a heliostat model of three reflectors to reflect the sunlight into a receiver, three Fresnel lenses to focus the reflected light onto a heat exchanger that produces pressurized steam to rotate a turbine-generator unit. The system is wirelessly monitored and controlled using a proportional-integral-derivative control algorithm. A graphical user interface unit is designed to monitor the whole system using either a PC or a Tablet PC to introduce mobility to the system. A photovoltaic (PV) solar cell unit is used to generate the necessary power to make the system self-sustained.

The user interface is connected with the Arduino microcontroller using Bluetooth technology. A Bluetooth chip will be on the microcontroller side to receive the Bluetooth signal and send it to the system. Moreover, the microcontroller will send information about the system to the control unit (CU) using the same technology. The CU will be able to send commands to control the position of the reflectors manually, in emergency cases. In addition, the CU can receive information about the temperature of each reflector and the power generated by the system.

The system algorithm is designed to track the sun and control a number of reflectors to focus sun rays on the heat exchanger. The sun tracking system is programmed to track the sun based on a comparison between the intensity of light for different multiple light sensors. The main goal of the previous process is to measure the incident angle of the sun. This angle will be used by the microcontroller as an input for a more sophisticated computing algorithm which will be used to calculate the orientation of the reflectors with respect to the heat exchanger. This process of computation will be supported with a feedback mechanism which updates the microcontroller with the status of the reflectors and protects the system from any failures. The system is designed to support two modes of operations; a real time tracking system, and a GPS based system. The microcontroller will use one of the modes as back up for the other, and the CU can choose the initial mode of operation. The choice between different modes will add more flexibility and robustness to the system. Since security is essential for such system, the system is supported by means of security features to authenticate the access to the system and these features include encryption, password and alarms.

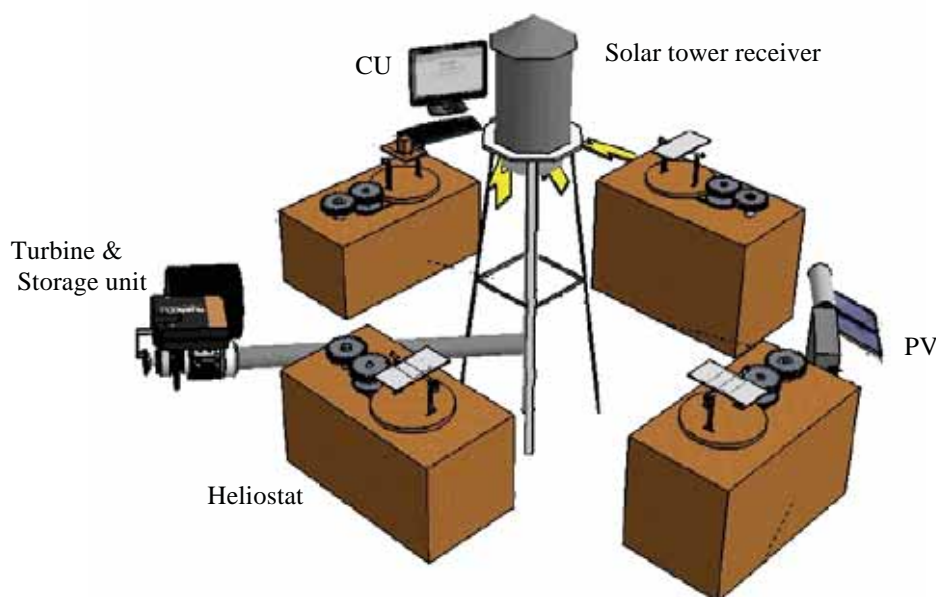


Figure 1: Solar Power Generation System



Impulsive Noise Reduction in MIMO-OFDM using an Adaptive Clipping and Gating techniques

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Supervised by
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ABSTRACT

The impulsive noise is considered as one of the critical issues in the world of telecommunication systems. MIMO-OFDM is one of these systems that can be affected by the impulsive noise. The MIMO-OFDM system is a development in which the receiver receives a main carrier signal including multi sub-carrier signals orthogonal to each other that propagate through the transmission channel to increase the probability that the receiver get a better quality signal. Also, using the OFDM technique increases the quality of the transmitted signal. The quality of the signal, however, is degraded when the system is subjected to an impulsive noise. In this project, the impulsive noise effect in the MIMO-OFDM system is minimized using the proposed techniques of clipping, gating and adaptive clipping and gating. .

The system structure consists of two main parts. The first part is the transmitter, where the signal is modulated and passed through OFDM mapping, and then it is sent through MIMO system. The second part is the receiver where the signal is de-mapped and demodulated and goes through the proposed reduction techniques of reducing the impulsive noise.

To achieve the aim of this project which is to reduce the impulsive noise interference in MIMO-OFDM system using different adaptive receivers, first, the impulsive noise was modeled and generated using Matlab/Simulink software. The main concern in generating the impulsive noise was to have its main characteristics to emulate the actual impulsive noise in practical communication systems. Then, the MIMO-OFDM communication system was designed and simulated using Matlab/Simulink. The performance of the MIMO-OFDM system was then evaluated in an AWGN and impulsive noise environments. Finally, clipping and gating adaptive receiver structures were designed and implemented at the receiver side of the MIMO-OFDM system.

The gating method for impulsive noise reduction uses a blanking technique in which the gate opens for an equivalent duration as that of the impulsive noise in order to eliminate it. In clipping technique the amplitude of the impulsive noise will be clipped or limited by a threshold which is known at the receiver.

The proposed adaptive receiver for impulsive noise reduction consists of an IN environment detector that decides the level of the received impulsive noise (low, medium and high) depending on predefined optimum thresholds, and accordingly; the signal is directed to the suitable reduction technique. There are two thresholds for this system and according to these thresholds, the reduction technique is decided. If the IN level is below the threshold IN1, this means that there is no need to use either of the techniques because the noise level is considered to be very low. If the IN level is between the threshold IN1 and IN2, the level of the noise will be considered a medium level and the gating technique will be applied on the signal to reduce the impulsive noise. Whereas, if the noise level is higher than IN2, it is considered as high level noise and in this case the clipping technique will be used.

The bit error rate performance of the MIMO-OFDM system with impulsive noise channel is enhanced by using Clipping, gating and the proposed adaptive technique. In these simulations, the user considered 2 x 2 MIMO-OFDM systems. Binary Phase Shift Keying is used as a modulation scheme. Also, we considered the range of the signal to noise ratio is up-to 10 dB. The performance of the system is enhanced and the effect of the impulsive noise is reduced by using clipping and gating techniques as shown in Fig.1.

As shown in Fig.1, the performance of using the gating technique is better than that of the clipping technique in reducing the effect of impulsive noise on the MIMO-OFDM. Also, the proposed adaptive technique is used to enhance the performance by using the proposed environment's detector. This is used to decide the suitable reduction technique between clipping and gating depending on a certain thresholds which are related to a specific parameter of the Impulsive noise. The bit error rate performance of using the proposed method is shown in Fig.2. The performance shows that the proposed adaptive technique yields a 1 dB improvement at 10^{-3} .

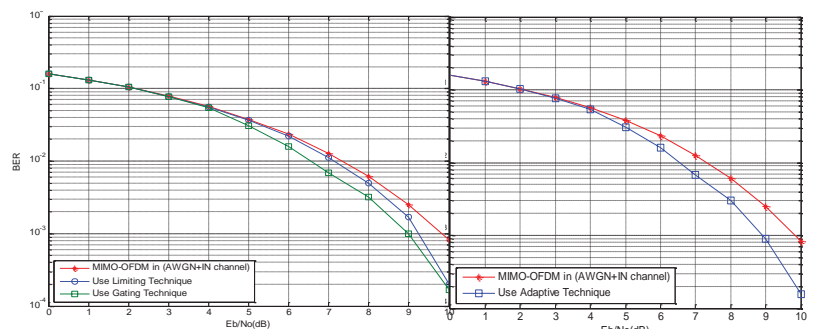


Figure1: The effect of the clipping and gating on MIMO-OFDM with IN.

Figure2: The effect of the adaptive technique on the BER



Social Media Marketing: a handy and economical promotion tool: Can it work for Cosmetic SMEs in UAE?

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ABSTRACT

In the 21st era, rapid advancements in technology have positively impacted our basic lifestyles. This has given a rise to the number of emerging entrepreneurs who have used technology to develop new business models. Modern day organizations and effective marketers are now trying to leverage popular social media for promoting their products. This new wave of social marketing is also called viral marketing and popular media for such marketing are – Facebook, Twitter, YouTube and Blogs. Social marketers create their company or product profiles on such online social networking sites and promote them through the promotional tools and services offered by the said sites. Furthermore marketers use the symbols or icons of these sites on other promotional tools such as TV Ads, Newspaper Ads, Internet Ads, Email Ads etc. This enables customers, interested in the products to click the icon and get redirected to the respective Facebook or Twitter website page of the product. Once customers go to the page they are given choice to “like” or “follow” the product. If customers do so, then they get regular updates through email or other notifications about various promotions and offers available for the product or service. This innovative method of social marketing is relatively cheaper than other traditional mediums like TV, radio, magazine etc.

Extensive research has been carried out in various advanced countries as this concept is a western concept and was introduced there. Less research has been done in the GCC especially in this domain. The researchers would review the existing literature in the field to identify the reasons for success or failure of this concept. Survey instrument would then be created on basis of the synthesized review findings. Researchers would then interrogate a select sample of UAE based entrepreneurs who run cosmetic Small and Medium Enterprises (SMEs) and have used this technique to promote their products and services. Researchers would also conduct a questionnaire to collect data from social network users in UAE. The survey data would then be analyzed to interpret the responses and correlate them to the findings of similar other research forays in the western countries. This exercise would enable the researchers to identify region specific parameters that could boost or bust the use of social media marketing in the region. Such parameters could provide crucial pointers that may help in building the right strategy to promote products and services in the region. This is the main objective of the undertaken research study. These findings may be of great importance to small and medium sized business organizations to initiate their social marketing promotional strategies. The results of the research have a regional flavor that could be of specific interest to social media sites such as Facebook, Twitter etc. to customize their offerings to the market in the Gulf Cooperation Council (GCC).



A Resource Based Management System Designed for the Dubai Statics Centre

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ABSTRACT

This project reports on some of the key challenges with integration and accuracy of information in Dubai Statistics Center (DSC), which provides the best electronic services in the provision of databases and statistics on the emirate of Dubai. The project proposes a Resource Based Management System (RBMS) which is largely about the allocation of researchers within different projects. The Human Resources (HR) department faces several issues when new surveys are launched since projects usually require the recruitment of key source researchers to perform the field data collection. Currently HR has a huge list of personal information about researchers who have previously joined and conducted in surveys. However, this data is only available on Excel sheets and Word documents that are not well organized and with low data integrity. Moreover, no filtering facility is available due to the nature of the data, and there is no easy way to update the records. In addition, there are currently few users that are handling this data and processes due to its difficulties. The consequence can sometimes be the loss or repetition of pertinent information and the lack of sharing information between key departments. The reason for the proposed system is that nowadays services in any organizations require a system that can integrate information to perform common work processes digitally between various departments in an organization. This project conducted a qualitative study involving interviews with key HR and IT staff to understand more in depth the user requirements, integration and sharing of new information between the various departments. The findings show that DSC needed an integrated system that can assimilate and share information between the different services in HR and Help Desk. In particular, the findings show that the allocation of research project between the HR department and IT services play a key factor in generating new project related knowledge. The proposed Resource Based Management System will provide a platform for HR and Help Desk users to share pertinent knowledge about projects and to centralize high data integrity of the various projects undertaken by researchers. Furthermore, the proposed system provides an easy and rich way to filter and search the database of researchers that have previously worked with DSC and to check their status and performance. Further, the proposed system will attempt to provide ways to solve the access of data from several users that can have access to information. In addition, in order to create a secure environment the proposed Resource Based Management System (RBMS) provides security on the data between key departments regarding various personal resource details. Moreover, it translates all the manual tasks between key departments and automates them in order to save time while also reducing work pressure.



Compiler Instruction Scheduling for Low Energy

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ABSTRACT

Reducing energy consumption has become an important issue in designing modern computing systems. This is particularly important on embedded processors and mobile devices, where a longer battery life is highly desirable. The amount of energy consumed by a given system depends on both the hardware and the software. The compiler plays a key role in this, because it controls the selection of machine instructions and determines their order. The instruction order dictates the amount of switching energy consumed by the program. This order is determined by the compiler in a code generation and optimization phase called *instruction scheduling*.

Algorithmically, instruction scheduling for minimum switching energy can be formulated as a **Precedence-Constrained Traveling Salesman Problem (PCTSP)**, aka, the **Sequential Ordering Problem (SOP)**. Simply described, this is the problem of finding a minimum-cost Hamiltonian Path in a graph while satisfying precedence constraints on the order in which the nodes are visited. This problem is known to be NP-Complete, which means that there is no efficient algorithm that computes the exact solution to an arbitrary instance of the problem. Although a large volume of research has been done on developing precise solutions to the basic TSP Problem, much less work has been done on the PCTSP Problem. In the compiler domain, most previous work on scheduling for minimum energy has been based on simple, relatively imprecise, heuristics such as the nearest neighbor (NN) heuristic.

In this work, we use advanced algorithmic techniques to devise more precise algorithms for solving the minimum-energy scheduling problem in compilers. We propose a heuristic technique and a combinatorial branch-and-bound algorithm. These algorithms are built on previous work on the TSP and PCTSP Problems as well as our research group's experience with branch-and-bound enumeration for other NP-complete problems. The proposed heuristic technique is based on the Minimum Spanning Tree (MST) heuristic that has been used in previous work to solve the basic TSP Problem. We modify the technique to solve the PCTSP Problem, and thus construct instruction schedules with low switching energy. We also develop a branch-and-bound algorithm for computing exact solutions to the PCTSP Problem, thus producing instruction schedules with *minimum* switching energy.

We have implemented both scheduling algorithms (the MST heuristic and the branch-and-bound algorithm) and integrated them into the LLVM open-source Compiler. As a baseline, we have also implemented and integrated the simple nearest neighbor heuristic that is used in previous work on compiler scheduling for low energy. We have evaluated the performance of these algorithms experimentally using the SPEC CPU 2006 benchmarks. The initial results using randomly generated instruction encodings show that the MST heuristic produces schedules with 21% less switching energy than the schedules produced by the nearest neighbor heuristic. With a time limit of 3 seconds per basic block, the branch-and-bound algorithm produces schedules with 5% further reduction in switching energy relative to the MST heuristic. The branch-and-bound algorithm optimally schedules 95% of the hot basic blocks in CPU2006. Another 4% of the basic blocks are not solved optimally but are improved by the branch-and-bound algorithm. The algorithm improves the schedules of basic blocks with up to 297 instructions relative to the MST heuristic. We are currently working on incorporating actual instruction encodings for the MIPS architecture into our scheduling algorithms and further enhancing the efficiency of our branch-and-bound algorithm by developing more powerful pruning techniques.



The journey of change from manual to automate Healthcare Provider

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ABSTRACT

Today, the emergence of information systems in healthcare organizations is triggered by a need to manage the volume of health related information and handle the task of information processing in order to provide better facilities for patients care. Healthcare organizations are basically hierarchical structures. Furthermore their complexity is more than an ordinary business. They have more interdepartmental barriers and multiple authority structures. Time consuming and Lengthy process if pharmacist has to request and order for medicine from respective supplier. This would delay and result an ill service by the organisation. Also, patient and staff time is wasted mostly because of unnecessary and incorrect patient appointment or emerging of duplicate files and records. All this can lead to patients dissatisfaction due to inefficient and low quality services. In response to increasing concerns about quality and the rising need of accountability in health care sectors, a growing number of healthcare institutions have streamlined the process by adapting new technologies. One of the key challenges in UAE health organizations is the shift from manual systems to computer based processes. Patients and families who rely upon healthcare services shall be provided with respectful and dignified treatment all the time by a team of highly qualified professionals. This study proposes a new Healthcare Web-Based Enterprise Content Management System (HCWEB-ES) to fulfill the information needs of the Healthcare services for individual. This proposed solution has four modules Patient Management Module, Appointment Model, Staff Module and Medical Module. The web-based solution was developed using PHP and ASP.net (C#). PHP is open-source and ASP.NET is from Microsoft. Both languages can run together within the same website. The HcWEB-ES is designed to help healthcare sector to enhance the continuous management of health related information through various divisions within the organization (like Doctors, Pharmacy, Helpdesk, Reception and Human Resource). This system shall prove to be more effective in day-to-day business activities. The transformation to automated healthcare processes is triggered by a need to overcome the traditional approaches of providing healthcare services. The aim of the HcWEB-ES is to have its own centralized healthcare information system to better monitor patient care. In fact, it will lead to higher quality patient care, improved patient satisfaction, enhanced employee morale and lower cost service delivery.





E-Learning for Higher Education in the UAE

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ABSTRACT

In higher educational institutions teachers and learners are highly reliant on large volumes of learning materials including books and printed handouts. Some higher educational institutions are trying to adjust some of their traditional learning systems due to the waste of resources concerning teaching including time, money and energy. One of the learning system is that some institutions are using online methods in order to put the learning materials that can be uploaded by teachers and accessed by learners to share various learning materials. However, due to the remaining legacy systems that exists it is difficult to integrate older methods with the new e-learning approaches. For example, some learning materials are mainly stored on a network-drive which requires large space and can slow down the network causing limited access for learners obtaining essential materials. However, because of the need for change higher educational institutions are now becoming more responsive to learner needs and are willing to develop e-learning solutions by employing novel teaching technologies to make a learner more aware of the new challenges they may face.

One of the latest technologies that many higher educational institutions are now adopting is an E-learning approach for generating greater teacher learner interaction. In this ongoing study the use of iBooks was adopted as a means of replacing the traditional teacher learner environment. The iBook has many advantages such as it is a sustainable way of creating a teacher-learner environment since it reduces the number of resources used such as papers, ink, and money. Furthermore, it is an interactive approach of learning and it includes much useful functionality such as buttons, 3D images, puzzles and videos. Moreover, iBooks are easy to develop and an effective way to distribute the materials in a portable manner unlike traditional methods. A pilot study was conducted in a higher educational institution with the English faculty along with a group of students. The project was about designing and building an electronic book for IELTS (International English Learning Testing System) to be used by foundation year students. The iBook was created using a MAC system to develop and convert materials to an electronic book on an iPad. The requirements for understanding the needs of foundation year students and faculty were captured through conducting a mixture of group discussions and interviews. The faculty provided sufficient data about their requirements including the design and format of the iBook and its suitability and user friendliness. Furthermore, adopting this interactive learning environment in a higher educational institution will benefit the students gradually over the years by maintaining ongoing interaction with other students and faculty social networks such as Twitter and Facebook. Also, iBook helps students to improve their weak points by providing them suitable feedbacks while doing the practice related with the study materials. As well as, it assist students in knowing the correct definitions of some unclear words that are included in study material and the iBook is could be supported with some external links for extra information if required.



Spectrum Sensing Techniques for OFDM-Based Cognitive Radio Networks

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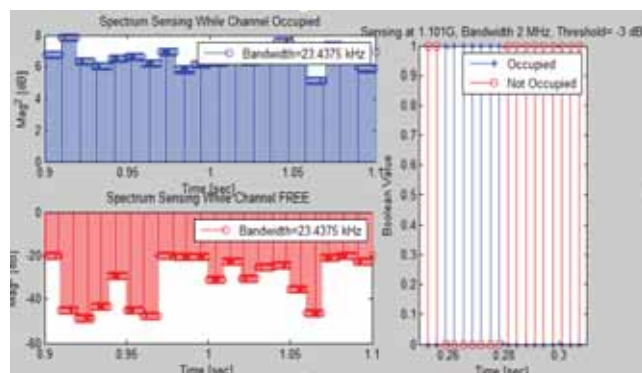
ABSTRACT

The need for efficient utilization of spectrum has become a fundamental requirement in modern wireless networks, which is mainly due to spectrum scarcity and the ever-increasing demand for higher data rate applications and internet services. Cognitive radios have shown to be very efficient in maximizing spectrum utilization due to its inherent spectrum sensing capability. In a cognitive radio network environment, different users can be categorized as Primary Users (PUs), who are known as users having higher priority, and Secondary Users (SUs), who represent those users wishing to opportunistically access the spectrum.

Three detection techniques are commonly used for spectrum sensing in CRs, namely, energy detection, matched filters, and cyclostationary detection. In energy detection which is the one with less complexity, the presence of a PU signal is simply detected by comparing the output of the energy detector with a certain threshold that depends on signal-to-noise ratio in the system.

Practically, in wireless communication, fading effect beats the effect of AWGN, with regards to BER characteristics. Moreover, we cannot guarantee that the communication channel is operating under non-fading conditions. Therefore, energy detection was implemented under fading conditions. Throughout our project we have first implemented the energy detection technique based OFDM under Rayleigh channel assuming the transmitted signal is OFDM. We have simulated the energy detection technique with probability of detection (P_d) vs. probability of false alarm (P_f) curve and taking 100 samples and different SNRs. It was shown that as SNR increases, energy detection gets better results.

In this project, we investigate the performance of spectrum sensing techniques from both simulation and experimental point of view, by implementing a Software Defined Radio (SDR), named GNU Radio. The energy detector was implemented for a bandwidth of 2 MHz centered around 1.101 GHz, and threshold of -3 dB and the discontinuous OFDM/BPSK signal was being transmitted from another CR. The Upper left figure is the spectrum sensing result when the channel was occupied and the lower left when the channel was free. The right figure gives “1” when the channel was occupied and “0” when it was free.





Segmentation of Retinal Vessels in Fundus Fluorescein Angiograms

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ABSTRACT

Diabetic retinopathy (DR) is a major complication of diabetes that affects vision and may result in blindness. Timely intervention for DR is very important to control the progression of the disease and minimize the possibility of vision loss. Diagnosis of DR requires ophthalmologists to carefully examine different sets of retinal images; such as color images and fundus fluorescein angiograms. This could be subjective, time consuming and error-prone. Recently, there has been a great interest in designing computer-aided diagnosis (CAD) systems to automate the DR screening process. A crucial and critical step in such systems is the process of segmenting the retinal blood vessels in the image. The efficiency of the segmentation step affects the accuracy of the system significantly. In this paper, a new vessels segmentation algorithm is proposed. The algorithm combines multi-scale vessel enhancement filtering and adaptive thresholding to extract retinal blood vessels in fundus fluorescein angiograms. In general, the algorithm consists of the major steps shown in Fig. 1.

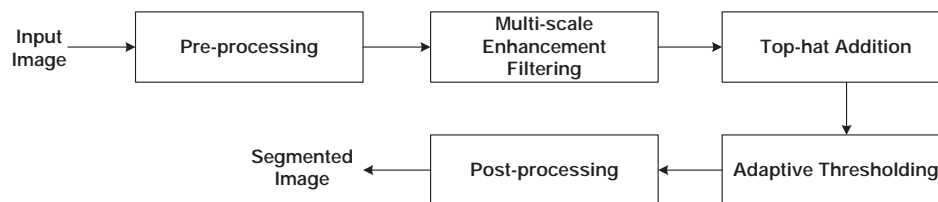


Fig. 1. Flowchart of the proposed algorithm.

As a first step, the input image is processed to highlight important details and reduce the noise by contrast enhancement, smoothing, and image negation. Contrast enhancement was achieved through saturating 1% of data at low and high intensities of the image. Our experiments showed that computing the negative of the image greatly improves the result of the subsequent multi-scale vessel enhancement filtering (MSVEF) step, which is incorporated in the proposed algorithm to facilitate the detection of tiny vessels as well as main ones. The MSVEF relies on measuring the vessel-likeness based on the eigenvalues of the Hessian matrix of the processed image at different scales. Based on the computed values at each scale, a set of predefined similarity measures are calculated to determine whether a pixel may belong to a vessel or not. Subsequently, the filtered image is added to the top-hat filtered image in order to emphasize fine details. The output image of this step is fed into Wellner's adaptive thresholding algorithm to perform the segmentation process. This step produces a binary image that is assumed to have the pixels belonging to blood vessels identified correctly. Finally, the segmented image is post-processed in order to reduce the segmentation errors. Basically, this step relied on checking the size and shape of isolated regions in the segmented image.

In order to evaluate the performance of the proposed algorithm, 10 fundus fluorescein angiograms were manually segmented under the supervision of an ophthalmologist to serve as the ground truth. Five images in the dataset were for normal people, while the other five were for people diagnosed with DR. The original 10 images were segmented using the proposed algorithm and compared at the pixel level with the manually segmented images. On overall, the proposed algorithm achieved average sensitivity of 85.22% and specificity of 96.98%. Additionally, the results showed the capability of the algorithm to segment both bright and dark vessels.



IT Practical Training System

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ABSTRACT

Practical training is important for IT students to practice what they have been studied, and improve their skills. Because of this, Information Technology Department in King Saud University plans to provide the practical training course as a part of its curriculum and have agreements with many organizations to train students. However, practical training was recently implemented at the department, and the process of the application done manually, which makes a lot of difficulties and obstacles for both students and staffs who work on organizing the process.

In the second semester the department announces the names of the organizations that provide training to the students. The student can choose from these organizations or she can contact any other organization. After she writes her wish list, she should be involved in a long paper based process to apply in the training course and she has to contact training committee to finalize their registration. The committee member collects and evaluates a lot of papers and forms; also they should have an easy access to students' data to follow up with them during the training time. However, in the ordinary websites the submission problem only can be solved.

The department decided to perform this process using an available online system, unfortunately all systems are dedicated to individual companies which they do not match IT department requirements.

From these obstacles, the idea of this project came, to make the application process in the practical training easier. The aim of our project is to develop a Web-based practical training system to handle all the processes starting from students' application to assigning each student to an organization by the staff member. The system serves four types of users: the head of practical training, the committee members, secretaries and students. We reached the aim through several objectives:

- Make the registration online: The students can apply for the training online by uploading, editing all required information and documents, and submitting her wish list without any other papers or documents.
- Make the communication easy: For the students easily to know about the important announcements and comments about organizations. For the committee members, saving time and effort by organizing events schedules and posting automatic announcements on the site, which linked with a twitter account. Also, making the communication between faculty members simpler by sending emails and arranging for meetings.
- Make the management of practical training easier and efficient: Submitting all requests online and having an automatic process for accepting and rejecting requests. Moreover, the organizations' information can be added and edited online. At the end of the training, having statistics about the training process.

After implementation and integration phase (*figure 1*). We examined the users' acceptance by allowing them to test the system. We conducted a seminar that describes how they can use Practical Training System. Then we tested the ability of them to use all functions. Thankfully, the practical training staff liked our work so, in this semester, the department starts using the system for practical training.

For long term objectives, the system will be a database for all IT department students who take the training in the summer, and make this project a sample for practical training management for other departments and universities.



FIGURE 1: PRACTICAL TRAINING HOMEPAGE



iRannan: Computer Based Aural Rehabilitation Remote Training/ Monitoring Tool

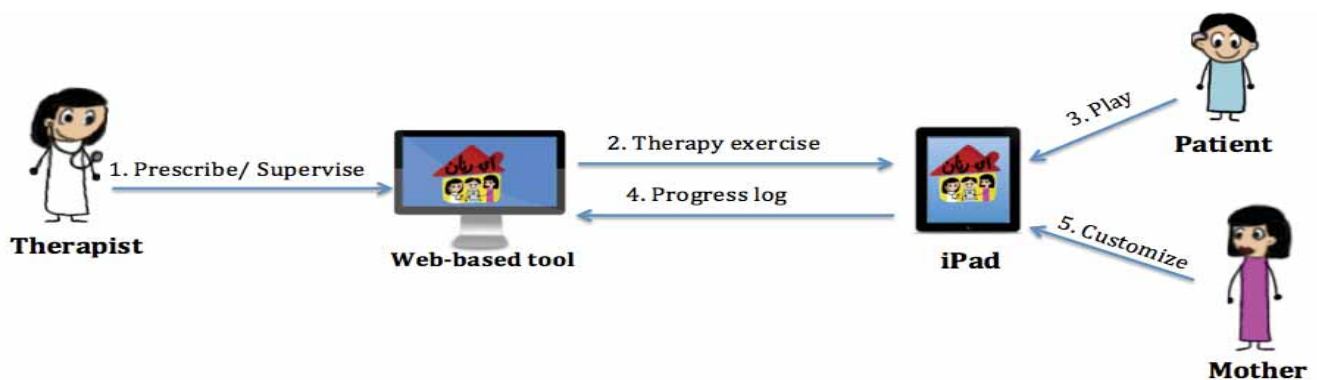
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ABSTRACT

Hearing impairment in Saudi Arabia has received huge attention recently due to endogamy marriage that resulted in a dramatic increase in hearing impaired individuals among children. Recent technologies, cochlear implants (CI), help acquire hearing abilities, yet they do not restore the auditory skills required to enable proper communication, so patients need to follow with Aural Rehabilitation(AR) in speech clinics and home. Statistics provided by King Abdul-Aziz University Hospital reported 57% of implantees don't receive any further training at home by their caregivers. Consequently, patients will not experience the full advantage of the implant, and squanders around 300,000SR in which implantation and rehabilitation cost per patient. Moreover, the shortage in rehabilitation staff in the kingdom hinders the accommodation of new patients in hospitals' therapy programs. Our goal is to automate the therapy in order to resolve such shortage, and activate the role of home based training which reinforces the relationship between home and clinic by maintaining a channel for remotely monitoring patients' progress in their home.

iRannan is an aural rehabilitation project aimed at enabling a patient to receive training at home under the supervision of a caregiver. In addition, iRannan enables the therapist to monitor the patients' progress remotely. Such features will mainly serve the majority of CI recipients who are unable to follow-up with clinical-therapy because their residence lacks therapy centers. Moreover, it will contribute in resolving staff shortage problem by reducing the number of unnecessary visits/patient. The first part of iRannan is an application on the patient's iPad, which offers therapy exercises as serious games with progress-logging as prescribed by their therapists. In addition, the caregiver can customize the therapy according to patient's cultural lingo. The second part is a website used by therapists in order to supervise the patients' improvements remotely and prescribe more exercises in the therapy plan as patients need.



The target users of the system are children in the age group (3-7)Y.O. Hence, the serious games included in the system are designed to be simple, easy to understand and with special design considerations for interface and feedback as the patients are distraction-prone and subject to frustration. The caregiver and therapist are of basic computer proficiency, therefore, system functionalities are simple and metaphors enrich interface design. Since most of our users lack Internet connection, the system runs with Internet connection where therapy plan/progress are synced between therapist and patients, or without connection where the patient's application will take over and control and prescribe exercise according to the patient's performance.

Users testimonial proved that automating rehabilitation exercises and activating home-based training will contribute to considerably reducing the therapists' workload in terms of shortening the rehabilitation period/patient and reducing unnecessary visits. In contrast with classical therapy, presenting these exercises as serious games will provide patients with stimulating and engaging environment that will positively influence the patients' response and performance, and support the program therapy.

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CCSR: Controlling Computer Using Speech Recognition

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ABSTRACT

Computer is considered as an important tool in different fields and for different age categories. As we know, the number of computer users is increasing year after another. For this increasing many technologies are provided to facilitate the use of this tool.

Some of computer users , specially physically challenged people face problems when using and controlling their computers. Controlling computers can be achieved using different solutions such as: keyboard, mouse or touch pad.

Voice-based software were proposed to facilitate the task of controlling computers, but there are some insufficiencies when using these software and the most notably are:

1. Do not support many languages, one of those languages is the Arabic language.
2. Missing of some important instructions needed by the user.
3. Difficult to use for some users.

CCSR is our proposed solution to those problems. It is an application that enable normal and physically challenged people to control their computer using speech commands in an easy way. It supports Arabic language and enable user to open, close any file, folder or application, create folder and move files into it, restart and shutdown the computer, delete file and another functions.

CCSR is composed of two sub-systems, the first one is an automatic speech recognition (ASR) system is developed. It is a technology that allows a computer to recognize the words spoken by a person into a microphone or telephone. Features of the sound signal are extracted using Mel-Frequency Cepstral Coefficients (MFCC) and the statistical model used in the recognition process is developed using Hidden Markov Model (HMM) implemented in Hidden Markov Model Toolkit (HTK toolkit). Also the required files needed to build the system, specifically the grammar and dictionary files, are defined.

When the voice command is recognized by the ASR sub-system, it executed by activating its Windows API function that enables CCSR to act as an operating system and executes the user voice commands.

The design of the main graphical user interface is shown in figure 1.



Figure 1: Main GUI of CCSR

Sound files were recorded and processed, their total number is 700 samples but only 144 samples are used; 6 samples for each of the 24 commands. Until now the system is able to recognize the commands “Open file” and “delete file” and activate their API functions. Developers keep working on the recognition of the rest of the commands. The API functions of the remaining commands are prepared and will be linked to the recognition sub-system. The batch file that links the interfaces with the recognition result files was created.

In the near future, the overall CCSR software will be tested to determine its recognition rate and accuracy.



Breast Cancer Diagnosis Using Machine Learning Technologies Based on Statistical and Texture Feature Extraction

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Supervised by:
Dr. Mahmoud Al-Ayyoub

ABSTRACT

Recently, Computer-Aided Diagnosis systems (CAD) have been used more to assist the health professionals in their work. Cancer has been the focus of many such systems. According to many studies, breast cancer is considered the most common invasive cancer among women with more than 1.5 million new cases diagnosed every year. It has a very high annual death rate of more than 400,000 deaths accounting for more than 1.6% of female deaths from all causes. Early detection of the disease, especially using mammography screening, is very crucial to the survival of the patient. In this work, we aim at improving the detection process by automating mammography screening and increasing its speed and diagnosis accuracy.

The current methods of breast cancer diagnosis depend mainly on experts' opinions. An experienced medical doctor (or a panel of doctors) would look at the mammogram images and decide whether the patient has breast cancer or not. Unfortunately, such an approach suffers from the known problems of high number of human errors (due to fatigue, pressure, etc.) and high cost of training and maintaining experts. Moreover, in many cases the diagnosis is inconclusive. This forces the doctors to take a biopsy, which is very accurate; however, it is expensive, painful, and takes time to obtain the final results.

The proposed approach is divided into three main stages. The first one is the image enhancement and segmentation stage in which we obtain the suspicious region from the mammogram images. The next stage is the statistical and texture feature extraction stage in which we extract discriminating features from the segmented image. Finally, in the decision making stage, we classify the tumor into benign and malignant. Figure 1 shows the pipeline of the proposed approach.

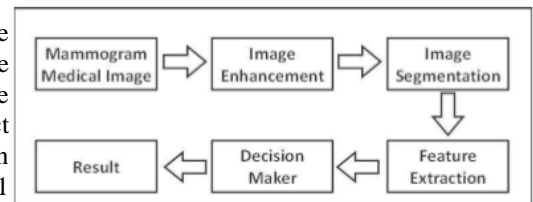


Figure 1: System Pipeline

Our system starts by applying several tools on the images to enhance them and remove any noise. We then use an iterative Otsu's N-thresholding segmentation method to extract the masses from the breast organ. This approach partitions an image into K segments based on a threshold. Figure 2 shows the results of this phase. Discriminative features of these regions are calculated and fed into a classifier since this work addresses the breast cancer diagnosis as a machine learning classification problem. Several classification algorithms exist in the literature. However, the C4.5 Decision Tree algorithm has been shown to be very useful and accurate in a variety of medical diagnosis problems. Consequently, this algorithm is used in this paper.



Figure 2: Original image Targeted region Final Image

To the best of our knowledge, current CAD approaches for breast cancer diagnosis are still performing below desired levels of speed and accuracy. In this work, we propose a system for this problem that is very accurate and fast as evident by the experiments we conducted. On a training set that was acquired from the Digital Database for Screening Mammography (DDSM), our proposed technique showed high accuracy with precision/recall values of 97.5% and 86.9%, respectively.

Finally, we believe this approach will help physicians make quick and more accurate diagnosis thus leading to an optimal choice of the course of treatment.



Microphone Array for Audio Surveillance and Conferencing

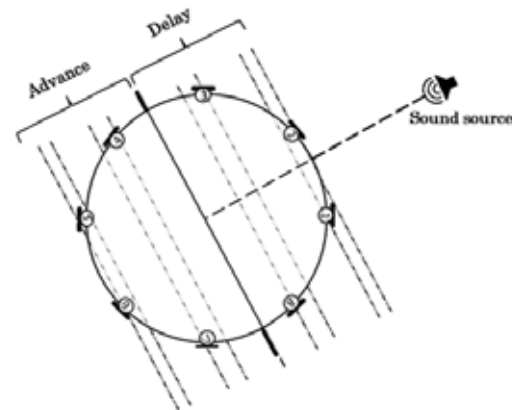
Abdullah AlShehhi, Mohammad Lua'i A. Hammadih, Mohammad Sami A. Zitouni, and Saif AlKindi
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ABSTRACT

Audio conferencing and acoustic remote surveillance are becoming critical issues in various fields, such as academic institutions, public spaces, and industrial sectors. In these scenarios, capturing a single voice with several microphones among a group of competing sound sources, such as people in a meeting speaking at the same time, is a problem yet to be solved. The method of communication in these conditions is problematic and inaccurate, owing to several reasons such as environmental noise, signal strength, external noise and the construction of the original sound. Furthermore, security is becoming a major concern in today's technological society, e.g. remote acoustic tracking and monitoring in crowded areas is strongly desirable for safety reasons.

Acoustic beamforming has turned out to be a promising solution for surveillance and multi-conferencing based on distant-speech interaction. This technique enables the capturing of an incoming sound from a desired direction and the elimination of other sounds, such as noise, from the other directions, without physically moving the sensing device, i.e., purely electronically. The purpose of this project is to design, analyze and implement a set of eight (8) microphones in a circular geometry to permit a time-spatial discrimination of the competing speakers and interfering noise sources located away from the microphone array. The system



will capture the signals and combine them in a multi-channel Digital Signal Processor with specific signal processing algorithms, which will result in amplified, filtered and clear speech. Several important challenges have been faced throughout the procedure of completing this project: building eight acoustic sensors from electret microphones and preamplifiers, mounting them in precise circular array geometry, digitizing the eight captured signals with a specific analog-to-digital hardware for real-time processing, and implementing in software the beamforming signal processing algorithms.

Several solutions have been presented to tackle this problem. Using a linear microphone array was the common solution for this problem. However, this solution was insufficient since the algorithms used in the linear array are not able to distinguish whether the position of sound source is coming from the front or the back of the array (ambiguity). On the other hand, after comparing the performance of the linear microphone array and the circular microphone array, it is concluded that the circular array delivers better performance as it enables both half planes' source localization, it does not present "ambiguity" lobes, and it is not bulky. For this reason the system was built around circular array geometry. This system can be used efficiently in many applications like acoustic surveillance (security and monitoring). Consequently, it can be used to monitor people located at relatively far distances and acoustically track them even in noisy environments.



Poll Snapping

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ABSTRACT

For the last Decades, many educational field researches have been calling for employing interactive teaching and learning methodologies in the classroom environment to improve the students understanding and help dyslexic ones as well. A key requirement for employing such interactive learning processes is employing means by which teachers can poll their students about a certain subject or matter.

Although there are a variety of polling techniques that educators can use, each technique has a certain type of limitation. A show of hands is usually subject to peer pressure as students who are shy or unsure align themselves with the most popular opinion. Moreover, getting responses from each one by one is time consuming and does not usually provide the educator with a complete picture of his class. In addition, written tests are a very slow methodology and are usually difficult to administer.

Therefore, we developed our mobile application solution called “Poll snapping” to simplify the process of polling a group of students on any topic in a timely and accurate manner. The system allows an educator to pose a question relevant to the lesson or lecture and instantly receive responses from all students at once in the form of usable and easy to read data. To employ the system, the educator distributes among the students paper on which a unique black and white barcode is printed. He then poses a multiple-choice question and instructs students to orient their paper in a particular direction according to their answer choice. Students hold up their papers, and the educator uses his phone camera to take a picture of the class. The picture is sent to the cloud, analyzed by a sophisticated computer vision algorithm that applies a variety of filters to the image like binarization and connected components analysis techniques to identify student’s responses and instantly send the results back to the instructor. This app offers immediately usable feedback from students and can increase efficiency in informal educational surveys and quizzes for seamlessly gathering student input and checking understanding. It is a completely new way of engaging students, checking for understanding in the classroom and conducting surveys in general. Also, the cost of using the entire system is relatively low and it can be used to poll a large group of students at the same time. The application is efficient and fast as well, which can save the time of the teacher. Moreover, students are not shy anymore to answer the questions and are not affected by their peers or colleagues in the class.

Compared to alternative solutions:

1. The application is time saving and efficient.
2. The application is essentially costless, all you need is generally already available in institutions of learning: mobile phone, internet connection and A4 papers.
3. The application can overcome a variety of problems that educators face like student shyness and peer-pressure effects.
4. The application can poll a large number of students at the same time.

Overall, we believe that Poll Snapping is an effective and efficient way of satisfying the key requirement for any interactive learning process. It can take the learning experience to a new level of interactivity and enjoyment.



Traffic Signal Control For Emergency Vehicles

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ABSTRACT

Introduction:

Traffic signal is responsible to motivate people and vehicles to ensure safety, efficiency and reduce risk caused by unorganized traffic. It's a vivid example of organization in our lives.

Problem statement:

Imagine a fire got in the next building and you call Civil defense and its Peak time congestion. The probability of coming on time and save the building with less detriments and damages will be low .what will you do to save the building? Is having Civil defense building in every residential district is the best solution for this case? Of course not! What if there's no traffic congestion but the fire engine faced closed road in their way .So how can we handle this problem?

Main problems:

- 1- How to make civil defense arrives on time before damages increased.
- 2- In emergency cases, traffic signals one of the delay reasons of fire engine because cars in the road not moving and waiting the green light.
- 3- Emergency cars maybe found a closed road in their way and that will make them be come late.

Objectives:

- 1- Closed road locations updated by municipality in the map.
- 2- Make a connection between fire engine and traffic signals to help to be on time in a safe way.
- 3- Civil defenses, Ambulance and Police will use technology in emergency cases to avoid closed road and arrive on time.

Methodology:

What will happen if fire engine comes late? The probability of loss and ruin will increase in every minute. From here our idea starts. We will develop application with verified account for municipality and Civil defense. First, the municipality will be responsible to add roads under construction or closed in the map of the application. Then, once Civil defense receives the call of emergency case they will add the current location in the map with destination of the place of the emergency case. Map will show the closed roads that must not go to and the available roads. After that the application will send data to traffic signals database controller that will place traffic signals in emergency mode .Traffic signals will track it movements, when it detect fire engine is near enough, traffic signal will switch to green light.

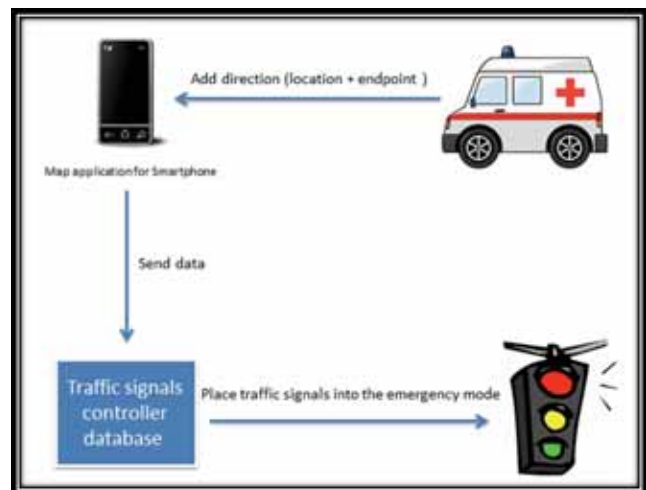


Figure 1 : Diagram of the solution

Results:

- 1- In emergency cases, congestion rate will reduce and fire engine will arrive on time.
- 2- Defenses performance will increase and they will become more professional.
- 3- Government departments will be associated with each other's.



Brainwave Communication for People with Severe Motor disabilities: The ABC Arabic Brain Communication System

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ABSTRACT

Communication is an essential part of human interaction. Sadly, people with special needs often lack basic means of communication, which poses a significant problem since they need assistance in their everyday tasks. This difficulty is aided by Augmentative and Alternative Communication (AAC) technologies, however, current technologies require voluntary control of muscles which is not suitable for individuals with severe motor disabilities (e.g. Locked-in Syndrome, ALS). ABC project aims to facilitate communication for Arabic-speaking people with severe motor disabilities by building a Brain-Computer Interface (BCI) application using the Emotiv neuroheadset, to provide typing and picture based communication controlled by the mind.

The Emotiv headset gathers EEG signals generated by brain activity from the surface of the scalp. Unlike gel-based EEG systems, this neuroheadset, originally designed for gaming, is affordable and easy to use. BCI applications generally consist of four main components, illustrated in Figure 1, these are signal acquisition and preprocessing, feature extraction, classification, and feedback presentation. For feature extraction, the system will use the P300 component, an involuntary response to sensory stimuli, to detect the actions to be performed by the user. ABC includes functions that help improve communication speed. Word prediction, for example, displays a possible desired word on the screen depending on what the user typed. Configurations can be applied by the caregiver to a user's dictionary, this will help increase the accuracy of the predictions. Additionally, a Text-to-Speech function voices what the user types into the system. Moreover, the user is able to communicate sentences using pictures. A picture is selected from a board and a descriptive text is printed out, the ability to add or delete pictures is provided to the user's caregiver.

This project adapts an iterative User-Centered Design (UCD) approach to ensure a good understanding of the targeted user's needs. In ABC, personas were created to help determine the context of use and the environment. In specifying the requirements, a range of activities were conducting including meetings with system stakeholders and drawing an affinity diagram. Design solutions were produced as user interface prototypes, which were evaluated with a cognitive walkthrough.

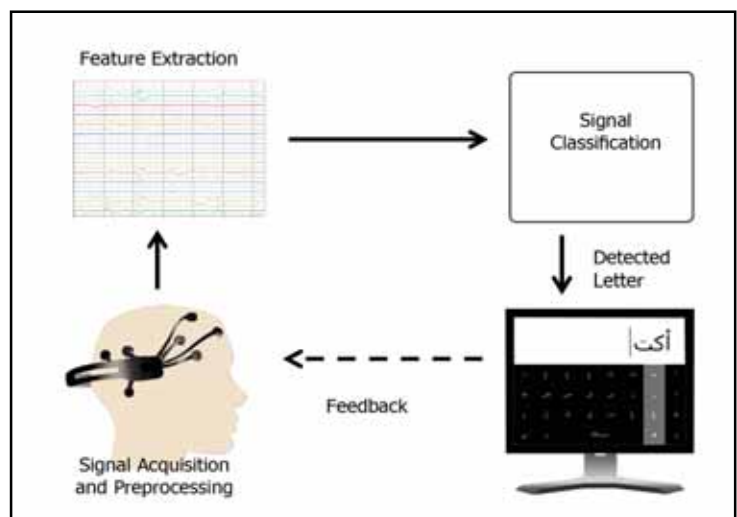


Figure 1: BCI Application Components

The originality of this project lies in the use of novel input method, brain activity, and the creation of a complete Arabic AAC system. Hence, providing a practical communication method for Arabic speaking individuals with motor disabilities by allowing them to type or convey a message by thought, without requiring the movement of any muscle. To the best of our knowledge, no Arabic BCI applications currently exist. Research conducted in this project provides valuable insights for the design of future BCI applications, and will help bridge the gap in Arabic AAC technologies.

Acknowledgement: The authors extend their appreciation to the Deanship of Scientific Research at King Saud University for partially funding the work through the research group project RGP-VPP-157.



Manasek Ar: Manasek Augmented Reality

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ABSTRACT

Millions of pilgrims come every year to Mecca to perform Hajj during the days of Hajj or to perform Umrah at any time during the year. Pilgrims need all the necessary information to accomplish their spiritual journey such as what rituals they must do, what places they must visit, where these places locate and how far these places are. They can get these information from several sources such as: their campaign, ask volunteers, use conventional maps or following signs. But there are problems when using these sources; some of them are not available all the time like the lack of volunteer, also joining a campaign force the pilgrim to stay all the time with them which prevent him from moving freely. Some of sources do not give the pilgrim accurate and adequate information such as street signs, so they are not enough to guide him. Also, it is not practical to carry manuals all the time, also manuals are not trusted because any one can print and publish them. Some of pilgrims cannot read maps. In addition, many foreign pilgrims are visiting Makkah once in a lifetime and during their presence in the country they would like to learn more about these holy places.

To address this issue we propose Manasek AR mobile application which aims to facilitate Hajj and Umrah journey for pilgrims through the use of their mobile phones. This application displays all the needed information about the pilgrim's surroundings in a mobile camera view. It allows pilgrims to choose the type of information; either locations of Hajj and Umrah places, historical information of these places or guidance information of how to perform rituals related to a particular place. Also allows pilgrims to add their campaign place, view maps, and get the recent news of Hajj circumstances through the official account of the Ministry of Hajj and Umrah in twitter.

Manasek AR's goal is to grasp the opportunity of utilizing AR technologies (Augmented Reality) to improve the Hajj and Umrah experience for pilgrims and overcome the difficulties they face. This application provides a complete guidance for pilgrims by giving them all the needed information about Hajj and Umrah places in a completely different way that engage them with their immediate surroundings. Figure 1 illustrates the architecture of the proposed application. In figure 2, an example is given when the user holds the mobile camera in front of Al Kaaba, the application displays the place name and the distance between the pilgrim and the Kaaba. The other information are displayed when requested.

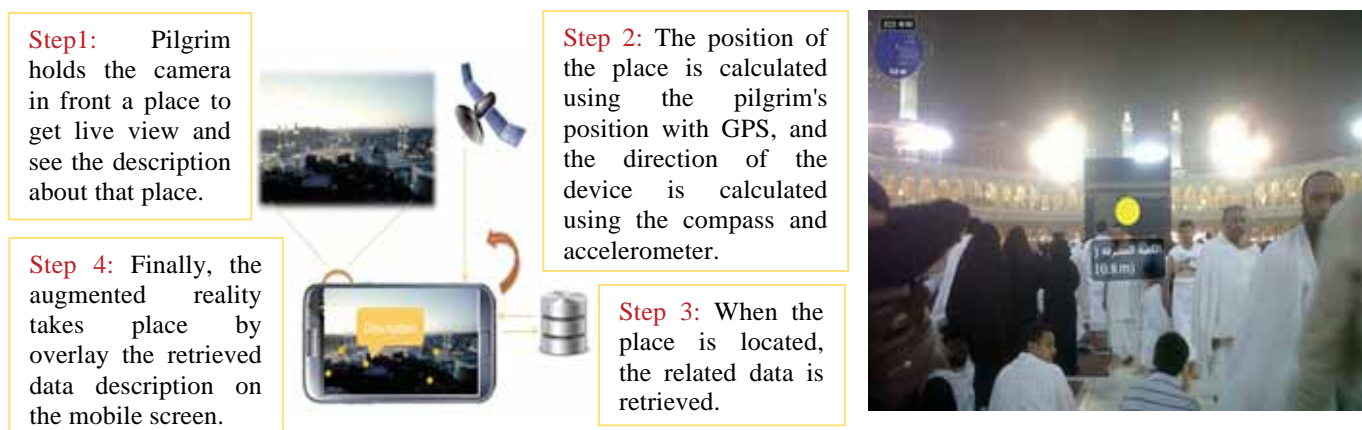


Figure 1: Manasek AR Architecture.

Figure 2: Localization of a place using Manasek AR

Manasek AR is an ongoing project, until now we have developed the main service of our application which is the use of augmented reality to recognize the place and give a description about it. Also we have developed the full interfaces of the application and the other services which are add campaign, news from twitter and view map. Internet connection is not required for most of the services. The software technologies used to implement the application include Android as Operating system, JAVA, Google maps and, Twitter API. We are in the integration phase of the project. Finally, we recommend expanding the application to cover wider areas such as whole Makkah and El Madina El Monawara.

Efficient Registration Technique for Watermarked Biomedical Images

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ABSTRACT

Image registration is the process of overlaying a sensed digital image with another reference digital image. This operation is required when the two images are taken at two different times, or by two different sensors, or with two different viewpoints. In these cases, the sensed image could be a rotated, scaled and translated version of the reference image. In addition, if the sensed image is watermarked (by patient name or file number), the rotation, scaling and translation distortion makes the extraction of the watermark a difficult task.

In This project, an efficient registration technique is presented for watermarked biomedical images. The technique is based on the Fourier-Mellin approach. The used approach is shown in Fig. 1. The watermarked rotated translated scaled sensed image is first registered using the Fourier-Mellin FFT approach. Then the extraction of the watermark out of the registered sensed image is implemented. Then the reference and registered sensed image are used to obtain relevant information. This proposed technique is applied for brain-tumor MRI images taken at two different dates. To test the validity of the proposed technique, GUI Matlab interface (shown in Fig. 2) is developed where the angle of rotation, translation parameters and scaling parameter could be controlled. An example of the extracted watermark is shown in Fig. 3 where a) The original watermark b) Extracted watermark when rotation angle is 15° and c) The extracted watermark when the scaling factor is 1.6.

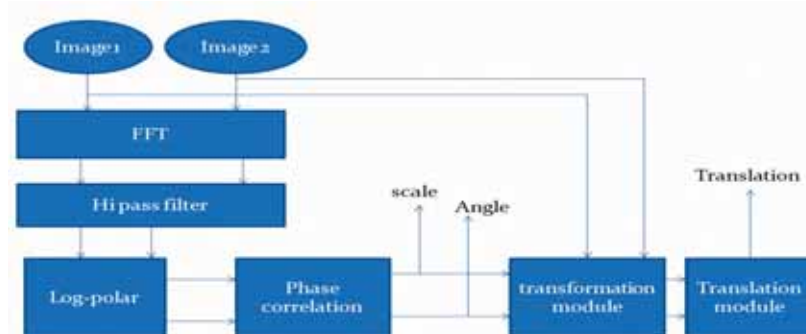


Fig. 1. Fourier-Mellin algorithm used for image registration.



Fig. 2: GUI Matlab for the proposed technique.

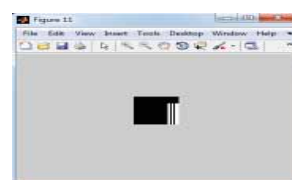


Fig. 3(a) Original Watermark



Fig. 3(b) Extracted watermark
(Rotation angle= 15°)



Fig. 3© Extracted watermark
(Scale factor is 1.6)



Ultra Mobile Forensic Lab

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ABSTRACT

Mobile devices proliferation has overcome the spread of traditional computing devices such as PC and laptops. This rapid spread has its impact on the field of digital forensics that was dominated by computer forensics for a significant period of time. The nature of mobile devices has changed the game of investigation as these devices carry an abundant wealth of data regarding its user. This data can be vital to an investigation as it can help profile the user, extract valuable artifacts or create connections to relations that would not have been found through traditional methods of digital forensics.

Mobile device forensics can be defined as a branch of digital forensics relating to recovery of digital evidence or data from a mobile device under forensically sound conditions. It is a useful source of information to any investigation that should not be dismissible, as mobile devices can contain details about who was doing what, where, when and with whom. This critical information can play a significant role in an investigation hence it would be necessary to gain this information as soon as possible. This need of a fast grasp of data is the core of onsite analysis, which requires performing the forensics analysis on the scene of the crime. The dilemma faced in this situation is the flexibility of the forensics work station needed for analysis from a mobile perspective as a well as from a monetary perspective.

Ultra Mobile Forensic Lab is a smart hardware/software tool designed to resolve this issue. The mobility, flexibility and cost effectiveness of the tool comparably to other available tools in the market would make it suitable for on-site acquisition and analysis of mobile devices as well as for computer devices. The design of the hardware will include a touch screen mode for ease of use and a desktop mode for analysis as well as a built in 64 GB micro SD card storage running on a 1GHz dual core processor with a 1 GB RAM and USB ports for connecting to other devices and external storage mediums. The tool will also include a full set of softwares specially designed for the tool to preform analysis of mobile devices as well as reporting of the evidence found. Along with these features the device is built and designed to integrate with third party hardware and software as the investigator can connect to hardware such as tableau write blockers to perform the acquisition or install other needed analysis software that can run on Linux systems such as sleuth kit. Along with the analysis and acquisition features of the device it would include organizational features for storing cases and organizing the case data. It could also be used to provide support such as recovery of mobile data. The device will support the versions of iDevices (iPod, iPhone and iPad) as well as all the versions of Android smart phones and most of the feature phones. The next phase of development of the tool will include the support for Blackberry phones and Windows phone.

(Poster Presentation)



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The aim of the organization is to reach paperless meetings. All parties will spend less time preparing, exchanging, storing, tracking and retrieving documents and will be able to perform more value-added tasks, which will increase overall productivity and solve the daily. The architecture of the proposed system is shown in Figure 2.

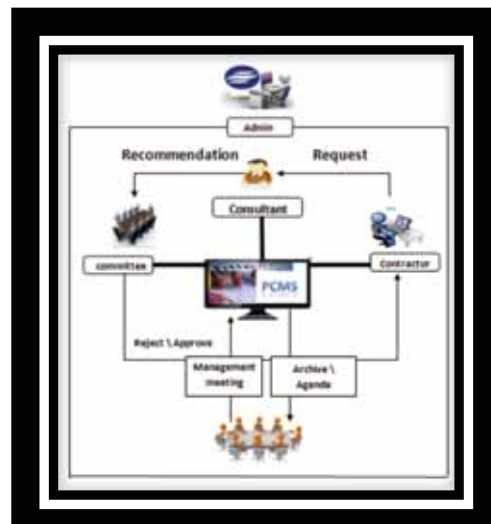


Figure 2: Architecture of Project Communication Management System



KSU-Connect: Soft-Phone for Internal Calls within the IT Department

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ABSTRACT

Effective communication is essential to perform organizational tasks especially within organizations with a large number of employees and offices. For swift and smooth communication, synchronous as well as asynchronous means of communication are essential. This requires dedicated phones, landlines, and phone numbers assigned to every employee within the organization. When this is not possible, or an employee is not allocated a phone or a phone number, employees tend to use their personal mobile phones or directly consult their colleagues in their offices to get a certain job done. This process is absolutely impractical and time consuming. As well as this, this process delays significant tasks that need to be performed immediately in addition to the waste of effort and money.

Our project looks at utilizing recent technology to support communication among employees in organizations. It focuses on a common problem that happens to be in our department, the IT department at King Saud University. Throughout this project, several phases were undertaken: firstly, to understand the needs of faculty members and staff; secondly, to investigate the available resources within the school; thirdly, to propose and discuss solutions; and finally, to implement the agreed proposal. All staff and faculty members in the department assured us that they use their personal phones very often to communicate with their colleagues. This happens when they cannot find their colleagues in their offices or do not have landlines available. This also becomes a problem when mobile numbers are unknown. However, every office has a computer and access to the Internet therefore this project proposes utilizing these available resources to perform internal phone calls through “Softphones”.

KSU-Connect is a software program for making telephone calls over the Internet using a general purpose computer, rather than using dedicated phones, landlines and numbers. Our proposed system is designed to behave like a traditional telephone and the aim was to develop it using open source to replace the old fashioned communication system currently in use. To implement the system, an open-source Softphone system was customized and its functionalities were extended to meet the user needs. The system performs all the basic synchronous telephony functions in addition to some asynchronous functionality such as the ability to send text messages, share files, and start conference calls. The staff and faculty members found the system very useful and suggested additional features, such as linking the system to their own calendar to receive calls and adjusting their status according to their schedule. Moreover, they requested a directory classified into categories according to their employment positions and pre-assigned extension numbers to each for easier searches as well as calls.

Using the system, staff members can be reached as long as they have the system installed, up and running. Extension numbers can be retrieved from the directory when an employee is searched by name or position. The feedback is very positive and the results show that this solution is useful, time saving and cost effective. Future plans for the system include: extending its functionalities, implementing it as a mobile application and having it available for download through the department website. KSU-Connect is being developed for the IT department in King Saud University but could expand to serve other departments and other academic and non-academic organizations. IT KSU-Connect is currently under development and the results so far are very promising. This project aims to extend the e-services provided by KSU to faculty and staff in an aim to better facilitate communication.



Smart Dealer Intelligent System for Online Shopping

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Supervised by:
Dr. Ann Nosseir
Professor at the British University in Egypt

ABSTRACT

Within each e-commerce site, optimized search engine will support users to find their needs faster. If any business doesn't know how to get the traffic to its site, Search Engine Optimization will simply increase the number of websites' visitors as well as increase profits. 90% of all website visitors are due to search engines, so any e-commerce business have to focus on a good Search Engine Optimization strategy. This could be done by finding the perfect keywords which visitors are looking for and ranking for them. In addition, searching techniques have a great effect on the performance of the search engine.

The problem is shopping through internet faces a lot of difficulties and constraints. When shoppers searching for their products and services such (clothes, jobs, apartments, etc.), they cannot find things that fit their needs easily. In addition, if they find the information about the seller, this information might be wrong or insufficient to communicate with the seller. Another significant problem is the search results. After retrieving the filtered results of searching that a specific user request, this result might be not related to the user request or insufficient.

This work proposes an intelligent search engine system to support and optimize customer shopping. This engine allows buyers to sort out their products and services preferences after registration. As a result, the system will automatically respond by sending an-email that contains user preferences of the user each with the seller contact details. K nearest neighbor algorithm (KNN) and analytic hierarchy process (AHP) are the techniques going to be implemented to build the search function of the intelligent system. KNN is a technique used for classification. It is also an example of instance-based learning, in which the training data set is stored, so that a classification of a new unclassified record may be found simply by comparing it to the most similar record in the training set. So, the result is retrieving the most similar records to the unknown record. AHP is a technique that used for analyzing complex decisions especially determining the correct decisions. One of the most important advantages that AHP technique supports is helping the decision makers to discover one that fits their aim. AHP technique gives a comprehensive structure for building a decision problem, performing its elements, linking those elements to all goals, and assessing substitute solutions. Both of KNN and AHP are going to be implemented in Java language behind the application. So, when users start the process of searching a product or service, the retrieved result will appear according to the search algorithm implemented. Then, both techniques will be evaluated and tested individually to decide which technique able to provide the optimal result.



MOR: Malls Of Riyadh

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Supervised by:
Dr. Abir binabid

ABSTRACT

Shopping Malls are some of the most important places that a tourist would want to go to in the city. They're great places to enjoy with friends and family where one can eat, shop, and much more. Shopping malls today are huge, and provide all of the products that a person desires.

Riyadh is a big city has a lot of malls and a lot of residents and tourists need to know the location of shopping malls that are close to them. They often find it hard and a waste of time and effort to determine the best and closest mall, then after arriving facing the problem of how to find the quickest way to the shops, prayer rooms, toilet and restaurants from their current location. There is also the problem of finding maps of the malls remark that show the locations of shops and other prominent site, as well how to find the shortest possible path between them.

To solve the problem we will design and implement a mobile application that displays a map of the most popular malls in Riyadh to help the user to find the nearest mall, and display the shortest way and fastest path to the user's current location using Google Maps.

The app will also help the user navigate inside the mall, and compute the shortest path to a specific store, using the Dijkstra algorithm. When we use this algorithm, each store will be represented as a node, the mall map as the graph and the edges as the path from a store to another store. Dijkstra's algorithm is called the single-source shortest path. It computes length of the shortest path in the graph from the source to each of the remaining vertices in the graph. We choose this algorithm because it is the best-known and most implemented shortest path algorithm between two locations (a,z). It is simple, easy to understand and implement, and impressively efficient.

The main goal of the project is to help the user find the closest mall to his/her current location, and to navigate the mall of their choosing. The proposed software is a mobile application that would increase the user's efficiency and flexibility, and would save them time. The potential benefits including user reaching the destination faster and having the information they want be available and easy to access. We also want to be the first producers of this type of app in Saudi Arabia.

Objectives of MOR application :

- 1- Display a map of all of the most famous malls in Riyadh.
- 2- Show user the nearest malls to him/her.
- 3- Display a list of all stores and restaurant & coffee places in the mall.
- 4- Display a parking reminder.
- 5- Show a map of the chosen mall.
- 6- Show users the fastest and shortest way from the user's location to the requested location.
- 7- Show the user's location in a map of the mall (where am I).
- 8- Show all malls that contains a specific store (Search).



Anti-Fraud For Telecommunication Companies “Nominated for competition in Academy of scientific research”

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ABSTRACT

Telecommunication fraud is the theft of telecommunication service in the telecom field, every single action should be planned first because they are working with a live network, with a millions of users so any risky action should be studied and planned well before any implementation. If there are any risks situation this will lead increase in the cost, damage the brand and the customer discontent, direct financial through fraudulent call misuse, loss in the service, regulatory fines, procedure and consequential financial loss. The system will score the fraud cases also, the system is similar to the idea of scoring system from I-SCORE company but for telecommunication companies.

The system aims for improving Egypt economic situation and to decrease all methods that aim to disturb people. It also , aims to decrease theft cases, which happen in most of telecommunication companies in Egypt lately. This happens through some people, whom exceeded the limit of their phone bills causing them to un-settle their bill payments. This causes people nowadays to close their line(s) and end the service with their mobile service provider. The next step is searching for another service provider and doing the same case over and over. So, this affects the Egyptian economy and increase the budget shortage in those companies and they lose their own right ..Each company will have a version of this system before any new customer asks or requests to buy a new line. The system will check using the national ID number of the customer to check if the customer has any previous un-settled bill payment with any other mobile service provider. The system will then process the transaction only in case the customer has settled all the payment(s) with the other company or has no records. This is a new method to obligate customers to settle all their payments before joining any other new telecommunication company.

The implementation of this system ensures that data of more than one telecommunication companies will collected in one database without interference of personal information related to customers in each telecommunication company.

Data will be collected through surveys, interviews and research. The project will be implemented with Java J2EE oracle database and oracle application server .in below will describe the system requirements which divide into functional and non-functional. Functional requirements in the system must contain mainly social security number and it doesn't support the interference of the information between more than one telecommunication company ,Also system must do evaluation for a new customer who will buy a new mobile line. .Non-Functional ensures that in case of interference between telecommunication company data. This system allows the retail store to login, check for clearness, create account ,send notification to other service provider, send reports for admin ,send to admin report for fraud cases and logout. Also it allows the admin to create account to retail store, receive and add users and also to send warning messages for unregistor new line.



Intelligent Spatial Database System for Schools Allocation

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ABSTRACT

Since 1990s, Egypt has faced critical problems in the educational system. It has been obvious in Egypt that schools located within urban areas provide better educational quality experience. (Allard & McKay, 2012) Mis-allocating schools in Egypt is a primary key for increasing illiteracy rate. Some areas have only few schools serving students within the area. This causes a negative educational experience. In order to maintain an equal seized educational experience to Egyptian students, new schools need to open not only in areas with high population density, but also in areas with few school buildings. Because the Egyptian economy is unstable, the intelligent system for schools allocation is designed especially for the Egyptian government to receive donations from businessmen, whom wish to assist in opening new schools in Egypt.

The software should eventually improve the education quality in Egypt, provide new opportunities for new schools to open in areas with low number of schools, locate schools with high number of students, decrease number of students in classes and ensuring a better educational experience, measure the distance between different schools in each area, and provide an equitable distribution of schools all over Egypt. Moreover, the software allows businessmen to search for areas lacking school buildings or areas in non urban areas. The next step is donating to the government and the educational administration, which will definitely assist the government in taking actions and start building new schools.

Interviews and web-based questionnaires will be conducted to study all functionalities needed in implementing the system. Also, to check that the system will be used by businessmen if implemented. Field research involves a range of direct observation and various visits to schools in different areas. The aim of such visits is to check the students' capacity, actual number of students, areas served, and the distance between the schools in different areas.

The project is to be implemented using Java J2EE and Oracle Database. The project will be deployed into an oracle application server. Java is used because it is an open source language. In addition, Java is compatible with Google maps API, since the application will use maps to highlight the location of school buildings. Java is the most suitable language when integrated with Oracle Express Database. In addition, it is easier to secure, to back-up and to do the recovery process for data through Oracle Express.

There are various functionalities provided by the system. It allows the ministry of education to search for schools in a specific area, check students capacity, distances between schools, and receive donations. Moreover, it allows the minister of education to check reports and receive complains. Businessmen will have the opportunity to view available lands, to view areas lacking schools, to select a location, to donate, and to book an appointment with the ministry of education to discuss upcoming steps after donation process is being completed.



Easily Portable Ultrasonic/Infrared Based Smart Board

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ABSTRACT

The traditional whiteboard is an essential communication tool in class rooms and office environments. However, their abilities are limited to simple hand writing. Nowadays, developing audience-interactive environments needs the use of visuals, animations, media and the Internet in order to approach high levels of shared understanding. These features are introduced in interactive smart-board systems which combine the simple use of whiteboards with the power of the computer.

The smart-board is an interactive whiteboard that replaces the traditional ink pen and eraser combination with a collaborative computerized system that offers the ability to interact with information on the board, manipulate it, capture it, and store it for future use. The system also presents the ability of integrating data from the computer's disk or Internet sources. A smart-board is likely to enhance the quality of information exchange (in an educational classroom or a collaborative team-work environment by establishing an interactive space to share and discuss ideas.



Several approaches were investigated for the design of the smart-board: electromagnetic, capacitive, resistive, infrared frame, infrared camera and infrared and ultrasonic. The selection of the appropriate design solution was based on investigating the technology that most thoroughly meets the following prioritized criteria; ease of setup, portability, expandability, cost and power consumption. Each of the mentioned approaches was evaluated based on these five criteria.

The electromagnetic, capacitive, resistive and IR frame designs cannot be moved once they are mounted on the wall, which means that they fail the portability criteria. They are also not expandable because the size of the board is set during the manufacturing process. They have high power consumption compared to both the infrared camera and ultrasonic and infrared technologies, in addition to the high cost and difficult maintainability. The infrared camera based design approach is easily portable, expandable and has low power consumption and cost, however, it is difficult to set up by the user due to calibration difficulty. This approach depends heavily on placing the infrared camera in just the right place to allow full coverage of the image projected from the PC. Putting the camera in the optimal position requires several trial and error iterations. In addition, there is always the possibility of blocking the camera view while the user is interacting with the board.

Based on the established criteria, we determined that the most fitting approach is the one based on ultrasonic and infrared technologies. A smart-board based on this technique is easily and quickly installable on any flat surface, allows use on variety of areas from small to large, inexpensive enough to allow use in personal or educational settings. Finally power consumption was considered very carefully to provide a reasonable-use lifetime for the system.

The design consists of two main parts; the receiver bar and the stylus. Every time the stylus is pressed to the surface of the board, it transmits ultrasonic and infrared signals simultaneously. The receiver bar contains ultrasonic and infrared receivers to detect the location of the stylus with respect to the board based on time of flight (TOF) and triangulation. The research illustrates the hardware and software design, triangulation and trigonometry calculations and communication protocol between the receiver bar and the PC.



An Intelligent Student Evaluation And Recommender System

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ABSTRACT

Intelligent Decision Support Systems are computer-based system that helps the decision makers in making their decision according to some bases designed in the inner algorithms of the systems. Decision systems are used in a very large scope by the management of the corporate in order to help the board in the Decision making activities and planning for the organizations.

An Intelligent Student Evaluation and Recommender System is an intelligent decision support system that helps students to choose the university or scientific field of study and that are commensurate with their potential scientific and psychology. These choices are based on scientific and psychological tests composed by professors in psychology and sociology. The student access to the system and resolve some of the tests that contain questions help to show a student's way of thinking and composition of his mind and get in the end suggestions for areas of study that suits him and also gets on the areas of the market and work in this area. The problem that this system tries to solve is that most students in Egypt choose their university based on some non-scientific ingredient of others. Some choose a field of study on the advice of his family or upon the choices of friends or at the Employment widespread and available in this period. Therefore this system is trying to assist the student in this problem until joining the appropriate field of study and achieve success in this area and help his country.



Technically, this system uses the data mining concepts to get the area of study preferred by the student. The areas of studies will be saved as a classes in the database saved on a server , and by using KNN , decision tree concepts , the student will find the most appropriate class that suits his answers. The system GUI will be implemented using C# language and it will be web-based application using the ASP.NET technology to make an. Also the GUI will be designed according to the Human Computer Interaction (HCI) rules and basics.

When the student will opens the web-based application, he will find a test divided into several sections those multiple choice questions tried to find the way of thinking, division of mind, personality, and previous grades of the student . After answering the questions, the system will calculate the result according to KNN, Decision Tree technique , Naïve Bayes algorithms. .Afterwards showing the result, the system also offers the Employment widespread and available in this period in their country, these also will help the student in the decision making.

Finally, the proposed system aims at creating a new generation of young people whose studies suits him and therefore will help them succeed in their studies and their work in the future and can stand up by them and rise in society.



Interactive Therapy of Attention Deficit Disorders with Gaze-Based Games

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ABSTRACT

Individuals with ADHD can be easily distracted, have memory problems and difficulty maintaining their focus on one task. As far as the neurobiologists have reached, there is no cure for this disorder; however, it could be managed¹. Treatment of this disorder often contains a combination of medicine and behavioral treatment. Psychological treatment is recommended to avoid the side effects of the medicines. Recent advances in interactive technologies have led to innovative approaches in the design of serious games that focus on behavioral therapy of people with ADHD.

Technologies have been developed to address these difficulties in non-medication treatments by designing interactive systems that use traditional input devices², and more recently, neuro-feedback systems such as Play Attention³; however, they usually do not give exact results on the degree of the user's visual attention and often do not provide accurate progress tracking. This project aims to support behavioral therapy with novel interactive gaze-based serious games that provide specialists with eye gaze measures such as intensity of gaze and patterns of visual attention. These metrics benefit the therapy process by providing insights into the progress of the child and quantitative measures of visual attention.

The 'Attentive Eye' game suite was designed in iterative cycles of design and evaluation that determined the final set of games for inclusion in the software to improve focus, filter out distractions, sustain attention, develop memory skills, and finish tasks. It was done in collaboration with Subject Matter Experts (SMEs) and involved experimental reviews of the feasibility of using gaze as an interaction approach. Tobii X120 was used to capture the eye gaze of the users. It incorporates illumination, sensors and 3D modeling of the eyes to track eye movements and process gaze using the pupil center corneal reflection technology. The captured raw gaze data was processed and filtered to be used as game control. Figure 1 briefly demonstrates the system.

After several tests and evaluations of the initial design, a working prototype was involved in a usability testing on target population and non-disabled population to outline the usability issues of the system and reflect them on the implementation and the design process. Several sessions of User Acceptance Testing (UAT) were then conducted with different sample of users to measure users' satisfaction of the final version of the system. Furthermore, focus group sessions were conducted with SMEs in two separate sessions for gauging their insights on the deployed version of the system from the perspective of specialists and practitioners. Trials on the system with developing children are being conducted in cooperation with the Human Development Center in Riyadh to test the long-term effectiveness of the system.

The 'Attentive Eye' game suite is a novel contribution to the assistive technology research domain. For rehabilitation practitioners, it is amongst the few systems that use eye gaze to control games intended for the therapy of individuals with ADHD. Moreover, the mode of interaction with visual attention enriches the games' potential to provide an engaging behavioral therapy program for the users and quantitative measures of progress and accurate tracking for health care providers and practitioners.

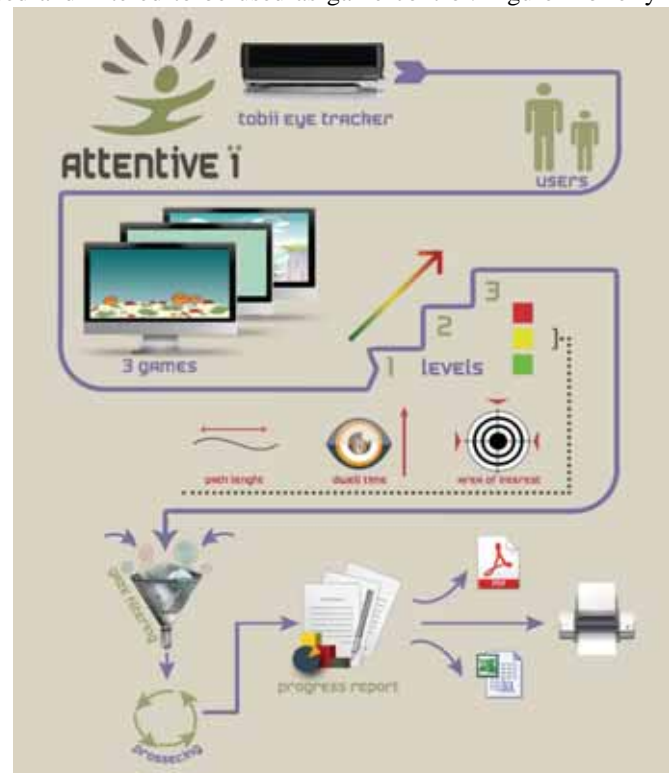


Figure 1 Attentive Eye's Conceptual Model

¹ Barkley, R. Attention-Deficit Hyperactivity Disorder: A Clinical Workbook, 2nd Ed., The Guilford Press, 1998.

² Lee, S. and An, J. 2011. Quantitative EEG evaluation of multimedia intervention program for ADHD children. In Proceedings of the 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL '11). ACM, New York, NY, USA.

³ <http://www.playattention.com>



RTFDS: A Real-time Fire Detection and Notification System Based on Computer Vision

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ABSTRACT

Fires are known for their fast growth and its capability of causing many deaths and economic losses annually around the world. For these reasons, it was important to develop systems that are capable of alarming when fires start to keep it under control. However, most of the common fire detection systems depend on smoke sensors primarily, and as smoke sensors are restricted to the existence of a ceiling or a wall it is not capable of detecting fires in open large areas, like public gardens and parking areas. Moreover, the height of the ceiling may cause suspension before detecting the fire due to the time it takes for smokes to build up to reach the sensors. The problem of open areas can arise from having a variety of flammable objects, such as trees, fuel of cars and the oxygen in the air, which will cause any fire to grow and expand very fast if it reached them. Thus, fire detection systems need new efficient techniques capable of detecting fires even in open large areas.

Therefore, according to the prior stated facts; this project was started with the aim of implementing a more efficient and trustworthy fire detecting system for open areas. Achieving this aim can be done by using modern technology and techniques of computer vision which can detect fire with the assistance of image processing technology. In addition, a notification system is integrated with the system to notify the concerned persons by SMS and email in the early stages of the fire before reaching critical situations.



Figure 1 Sketch for system context

The proposed system will be using computer vision through studying the fire's colour, shape, and motion in the detection stage. In details, when system initialized, it continuously acquiring images using web camera. Then, background subtraction algorithm applied by subtracts every acquired image from the reference frame to detect any changes. System starts studying the detected changes and its relation to the fire properties (colour, shape, and motion). After that, if the system detected a fire, the notification system will start by immediately sending SMS and Email messages to the previously registered contacts, who are supposed to be the place owners or the security staff of the area, to warn them to take an action before the growth of that detected fire.

In conclusion, fire detection systems are considered to be one of the vital surveillance systems; RTFD system is envisioned to have a higher accuracy and faster detection using the computer vision techniques. Also, it is expected to provide more safety and to reduce the losses caused by fires in public open places..

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Smart Glasses for people with visual Impairment

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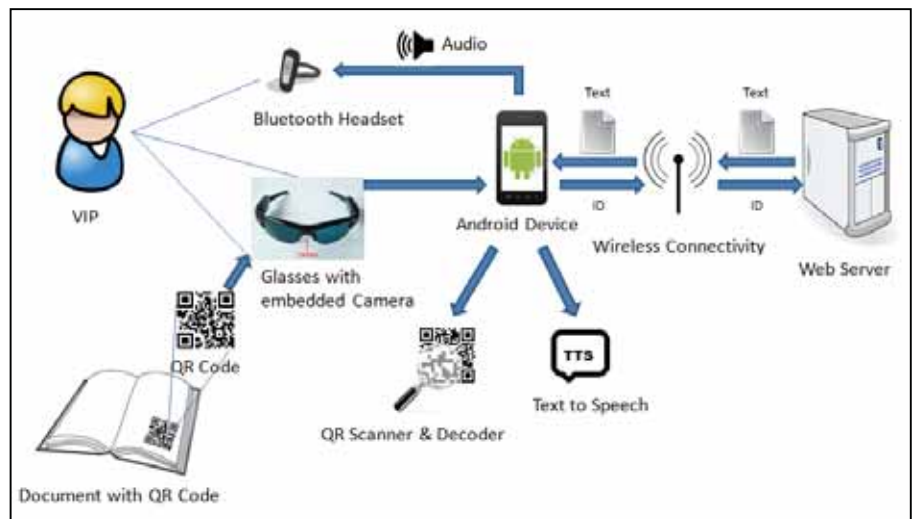
ABSTRACT

The area of assistive technology has encountered recently a significant expansion by the emergence of variously new products and methods. Many of these products can be utilized to provide the assistance to visually impaired individuals (VIPs). Some of these products were highly ranked as the most used products worldwide, yet they were not the most efficient. For instance, some require an extensive user interaction. Other methods demand expensive efforts and equipments to be used in addition to space and time. Thus, in this project, we propose to provide the user with high performance and economical solution to achieve the optimal comfort sought by users. It is a demonstration of an idea of smart glasses that can be utilized in a variety of regions and applications to help visually impaired people. They can use it to read particular documents with specific properties and criteria. Such documents must have an embedded unique code that is considered one of the most exclusive ideas that the design proposes. Our design leverages a scalable end-to-end client/server system, which facilitates processing, storing, and fetching of document contents in real time by the VIP person based on detecting embedded codes sighted by the smart glasses. The project also promotes the usage of a highly portable, easily used android-based application to fetch and play back document content to VIP person using text to speech.



In this project the problem is stated as follows: There is a fundamental gap between proliferating mobile technologies, and leveraging these technologies to improve the status of VIPs through providing tools and means to help them integrate with the society and enhance their life-style. In this regard, the project promotes the use of mobile technologies to provide a scalable end-to-end cost-effective solution to provide highly usable tools to help VIP person read and interact better with the environment around him.

The project leverages client-server web application and an associated database to process, store, and fetch document content by VIPs, to be able to read documents and books using one of the latest emerged technologies; QR codes (abbreviated from Quick Response Code). QR codes are generated using a sophisticated QR code generators to uniquely identify document page content, by embedding QR codes to the PDF (Portable Document Format) documents and producing a special Identification pattern for each page of that document. Finally, this modified document with embedded QR codes is ready to be read by people wearing glasses having a wireless camera attached to it. This camera is connected to an android based device that communicates with the web server by sending the decoded QR code requesting the document's page related text. The server searches its database, which contains all the processed documents' pages in a text format in addition to their special page identifier, by linking the received identifier with its corresponding text and sending it back to the client. Subsequently, the client converts the received text to speech so the user can hear it through a wireless headset.





Points of Interests

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L. Majdah AlShehri

ABSTRACT

Points of Interests is a Location-based service (LBS) that integrates mobile device's location with other information to provide added value to the user. LBS applications are becoming more popular and widely used whether incorporated in websites or mobile applications. Many social services lately have integrated some of their features and brought a new way of using them. The LBS concept came in development of the broader concept of geolocation which is the integration between electronic maps and GPS (Global Positioning System) using different types of identifiers for example; the IP (Internet Protocol) address, Mac address or RFID. Also, the Reverse geocoding concept is the process of finding the address or the name of a location for given latitude and longitude pair. While translating position from an address to latitude/longitude is called geocoding. Moreover, LBS system takes advantage of the geotagging technology. It is the storage of location based data, in the form of Latitude and Longitude inside of images.

Throughout 2010 many LBS and Application Programming Interfaces (APIs) have been released or updated. Most of these services focus on one of two areas: collecting and exposing vast amounts of geographic data, and allowing users to share their current location with others. The increased proliferation of location data services gave an idea of the need to add an enhancement on LBS applications available today by developing this project that goes beyond the limited scope of current LBS. The basis of this project is to develop an Android mobile application that provides rich, personal and location-enhanced service and performs a new type of reverse geocoding which support more meaningful location names.

The application provides many services from sharing user's locations, photos and updating user's status. The sharing service is provided by the ability of adding friends. Once the user has friends, he will be able to see his friend's activities in the form of timeline. This user activity is the location shared that is displayed in the form of a drop pin on a map, and shows the location name and optional photos the users upload.

The projects goal is to grasp the opportunity of utilizing modern technologies such as Google Maps that is embedded in Android mobile phones to provide more meaningful location names, within three conditions; low cost, high quality services and secure location services. This project provides a new way of annotation feature using reverse geolocation. It gives the opportunity to annotate locations by the user instead of the formal or regular labeling. This will allow users to customize their locations and their most interesting places by personalized name.

In terms of tracking activity, the project provides tracking of user's location history service using different visualizations. The user's history will be displayed as statistics and graphs. Also, the project provides a searching feature that allows users to search about activities posted by the users. This will provide a way for a user to find and add other user with the interests .Therefore , this application delivers personalized and relevant content when and where users need to be based on their location or where they want to go.



PVAS: Palm Vein Authentication System

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ABSTRACT

Authentication is the process of determining whether someone or something is, in fact, who or what it is declared to be, Biometric technology is becoming the base approach to fulfill the need of authentication and recognition systems, access control methods as well as solving the increasing crimes based on a physiological or behavioral characteristic such as fingerprint, face, hand/finger.

What we are proposing in this paper is the use of the pattern of blood veins; it is unique to every individual, even among identical twins. Palms have a broad and complicated vascular pattern and thus contain a wealth of differentiating features for personal identification. Furthermore, it will not vary during the person's lifetime. It is a very secure method of authentication because this blood vein pattern lies under the skin. This makes it almost impossible for others to read or copy which is the case in most current Biometrics.



FIGURE 1 : PVAS HOME INTERFACE

we used the PCA (principle component analysis) method to extract the features from the veins pattern after that we calculate the minimum distance between the two extracted features (the stored features and the user's hand biological features in real time) for the verification process and we stored them in MS Excel files to be able to fetch them later in the verification process .

As for the development environment, we used Infrared camera: The M2-PalmVein TM (figure 2) palm vein scanner from M2SYS which uses a near-infrared light to capture the hand, and Matlab version: 7.9.0.529 (R2009b) for the implementation.

The process of authenticating a user via his/her palm consists of the following steps:

- Acquiring the image: where the user place his/her hand on a scanner or a camera where his/her vines pattern will be captured a using a completely safe near-infrared light.
- Pre-processing tasks: contrast, brightness, edge information, noise removal, sharpens image, etc.
- Extraction of the pattern: This is unique for each user.
- Matching and recognition: comparing the image captured of the user's palm against the one stored in the database – one to many matching.



FIGURE 2 M2 PALM-VEIN DEVICE

We recruit 20 participants for testing purposes, 17 were validated positively (85 %), Out of those 17 positively validates, 13 of them were validates by the first attempt (76%), only 3 of them were validated negatively (15%).

Our system goes beyond only authentication into providing an environment for as administrator to manage user's personal information which we stored in MS Access files and providing help manuals, we believe that out project would impact positively in the authentication industry for its reliability and for its hygienic advantage over other biometric authentication technologies since it's a touch-less technology, as for our user we are targeting whoever is in need of speed and reliable method od authentication in daily transactions .



A Wireless Sensor Network based System for Pollution Monitoring and Weather Forecast

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ABSTRACT

Air quality is an important parameter that affects humans' health, the environment and the entire habitat on earth. Therefore, reducing pollution is of paramount importance to all stakeholders. Weather stations and pollution monitoring systems play an important role in the process of monitoring air quality. However, there is a need for a highly-accurate reliable system that helps predict the type and amount of existing polluting agents as well as the levels of threat to the environment in order to take appropriate decisions in a timely manner.

This paper is based on a project that used a wireless sensor network (WSN) to detect and measure various types and levels of air pollution in conjunction with weather conditions. It creates an integrated network of sensing nodes that are programmed to communicate wirelessly with a command and control system via a central gateway, enabling the end user to monitor and analyze data. Data includes, but is not limited to, temperature, wind speed, precipitation levels, and chemicals levels.

Integration of the system components is controlled by the central gateway that manages the transmission and reception in the whole network and aggregates data from distributed measurement nodes. It features a 2.4 GHz ZigBee protocol based on IEEE 802.15.4 radio communication standard, which enables flexibility, reliability, and customization of the acquired data depending on the network topology settings.

The ZigBee network layer natively supports both star and tree typical networks, and generic mesh networks. Every network has one coordinator device tasked with its creation, the control of its parameters and basic maintenance. Within star networks, the coordinator must be the central node. Both trees and meshes can be used to allow ZigBee routers to extend communication at the network level.

WSN measurement nodes can be configured either as end nodes or routers. Both configurations have the same capabilities and the only difference is the power consumption. For the end node, it will feature a low power sleep mode most of the time and only wakes up to sample and transmit data depending on the sampling intervals specified by the user. On the other hand, a router node is always awake and has the ability to extend the distance and reliability of the system by relaying data from other nodes back to the gateway. Because of this feature, an external power source is needed at all times to send, receive, and buffer data to and from end nodes. Thus, end nodes configuration preserves the battery power of the WSN.

With the LabVIEW Wireless Sensor Network Module, graphical programming can be used to customize the node behavior by adding intelligence in order to extend battery life, increase analog and digital input performance, and interface with custom sensors. The module can also be used to embed local intelligence, respond to digital value change events, and modify any behavior based on measurement of inputs.

The Pollution Monitoring and Weather Station project can be considered a promising application in regard to the environmental conditions that the region is experiencing, especially in the UAE. With the ability of the proposed system to accurately detect the level of pollution in a certain area in relation to weather parameters, weather forecasting experts and environmental scientists will be able to highly and immediately monitor these levels so that any serious consequences can be avoided. In fact, these responsible parties in the country will be always updated with the environmental state due to the continuous operation of the system. Therefore, for a country like the UAE with a growing number of factories and industrial businesses, around the clock monitoring would definitely be needed.

There are some environmental issues to be taken into consideration while designing and implementing the project. The system should work in a way that it does not cause any harmful effects. For example, the frequency to be used in sending and receiving the data should be selected within the allowable range in order to prevent any conflicts with other existing signals. Moreover, the system is proposed to be eco-friendly using recyclable materials.

The project offers a wide range of applications for both individual users and industrial fields. A mobile application based on the designed system can be introduced to keep individual users aware of the environmental changes surrounding them and updated with pollution levels within their area of presence and beyond. Another application is to check whether a certain land is suitable for agricultural activities based on precipitation levels, and to regulate the relevant irrigation schedules. With regard to power consumption, the designed station can be dedicated to analyze the efficiency of wind turbines, for example, in generating power. Actually, the intent of the project is to show how such an integrated network, when implemented, can be seen as a reliable multi-purpose system meeting the demands of various fields.



Secured E-Wallet System Using Virtual Account

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ABSTRACT

E-wallet is a concept which is developed to virtually represent persons on the internet. Using e-wallet can make online shopping easier and faster. There are some problems that can be solved throughout using e-wallet. These problems such as minimizing the number of times for entering payment details by one time, thus minimizing e-commerce fraud through an easy payment method. By this way consumers are more likely to make repeat purchases. e-wallets can provide convenient and safe way to store and use information a person carry on multiple cards in his/her physical wallet all on one single card. Internet users will be able to select which card they wish to use and accordingly forward this specific credit card number to the credit card machine. This will result in eliminating the need to carry cash. The project's problem can be stated as **“there is no e-wallet software that can provide more than password and encryption security metrics”** so providing a decent solution help in increasing user satisfaction and trustiness.

Here we can provide a clear objective statement for the project. This objective is; **“using virtual bank accounts to reduce the impact of hacking in e-wallets”**. Reducing the impact of hacking in the banking sector helps in building a way of trustiness between customers and using banking services throughout the Internet.

The benefits of using e-wallet are stated by many writers and organizations such as Ramos (2012) and AXIS bank (2012). Ramos reported that e-wallet makes it easier to make online shopping in addition to the benefits merchants have in order to support clients' throughput automatic filling for ordering forms. Axis bank mentioned in its' website that e-wallet benefits are; e-wallet accounts are created securely through two authentications measures via the internet banking. Besides; the e-wallet cards can be expired in a short period of time if the creation of the card is not used and the amount of currency is reserved in the customer's account. Moreover; an e-wallet card is used for a single use only without the ability of reusing it. Furthermore; Axis bank pointed out that a customer who created a card is the only one who can use the card and used cards cannot be reissued. In addition, the issued cards have no direct link to the bank account while using e-wallet information. The proposed solution is composed of five main phases. It starts with Process initiation phase, merchant phase, banking phase, virtual account creation phase, and finally submission destruction phase. Figure 2 depicts the main phases of the proposed solution.

The aim of the proposed solution is to provide a tricky security issue by creating an e-wallet virtual account contains the specific amount needed to accomplish the buying transaction. The following sections provide a detailed description about the project objectives and the proposed solution for developing secured e-wallet software.

E-wallet is one of the most important issues in providing secured e-commerce transactions. In this report we provide an introduction about secured e-wallet project by creating virtual banking accounts containing only the amount of charge. This process is done in order to submit the transaction. Then the system will destroy the virtual account to deceive any hacker willing to keep track of the transaction and extract secured data. This project also uses the famous methods of authentication which are password and data encryption.



FMS: Faculty Manager System

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ABSTRACT

In this paper, we present Faculty Manager System (FMS), a personal working assistant that help employees to achieving their work in the required time. It provides an easy to use and powerful tool to manage all the required tasks, related to responsibilities of their job role. FMS was dedicated and deployed into King Saud University. The university is a higher educational institution that contain a very large number of employees. Indeed, the employees must perform various tasks according to their job responsibility in the short time and in the specific order of steps. Unfortunately, due to the huge number of documentation and the complexity of some steps, achieving their duties can be hard and induce an unsatisfied work. Some employees can waste time and energy to accomplish each tasks. The main problem is that all the employees can't accomplish all tasks needed on time but they usually delay. This affect will be worst, in the case of the new employee that needs more time to understand his role responsibilities in the organization. The new users don't know how they must work and they need a training to do work efficiently. The managers are always looking for system that help employees to perform their tasks quickly and competently. They need a smart personal assistant for worker.

For that, FMS was designed to support any organization in general by allowing the administrator to add a large number of work activities and related tasks. FMS provides, also, a lot of personalized services in order to better meet the needs of the university staff. FMS propose a web interface to access to the personal working assistant. This website is a reference point to the employee who want to know where are papers and documents that is needed in order to perform his duties. According to their role into the organization, any employee can access to his personal web page that contains all his personal information, his job title description, his tasks list with all the detailed steps of each task and the attached documents if needed. In addition to that, FMS provide a daily monitoring assistant that helps the employee to follow the evolution of his work by updating the daily status of each ongoing activity. FMS allows the members to create an account using the university ID to login and use the system. All data in FMS is a real data which is collected from the university resources to make the system more reliastic.



FMS give a reminder tool that allow the user to specify the working status of each task start to work on. In the end of the working day, FMS show a pop windows of list of all the ongoing tasks to be updated in case if it is completed or not. The system will help the user to remember which of these tasks were not over yet to be supplemented later.

Moreover, FMS helps the employee in the search for any information, documentation or form may be needed during the work. FMS also gives the manager ability to monitor working activities of team, by viewing the status of the completed tasks per service, per job position or per employee ID. The manager can also access to the dynamic statistical analysis of all the completed tasks over the working hour.

In order to implement all these functionalities we apply a combination of qualitative and quantitative survey and smart algorithms. First, we establish the hieratical breakdown organization structure of the university. For each specific service, we do a large survey to collect all jobs inside The College of Computer and Information Science in particular. Then, we applied an association rules between each job title and it composed tasks and steps. We design an intuitive backend that allow the FMS administrator to add other services and a new job role. We use a timeless algorithm for the daily reminder function.

In this project, we tried to provide a smart manage to follow the user daily tasks in suitable time. This system presents a reminder functionality that help to support a huge member of tasks work in a short time and guideline for the new employee. Also it helps the administrator to handle the productivity of each employee and to access to the dynamic activities report. It's proposed in Arabic and English language allowing to be used by both of the native arabic employees and the foreign employee.



Incognito

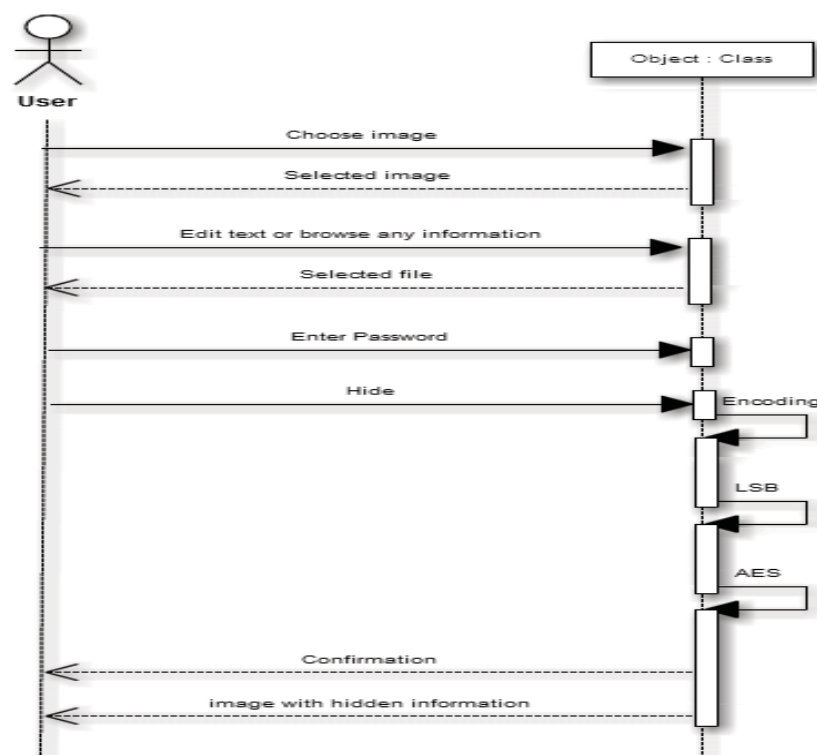
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ABSTRACT

This project is a mobile application on Android platform that utilizes both of Steganography and Cryptography techniques to hide different types of information (eg. text messages, pdf files, images, music files, etc.) in images without changing the image. This application is beneficial especially for business men, Military and anyone to send a secret data or files hiding in a picture without changing the picture how it looks like.

The application used “Least Significant bit ()” steganography technique to hide the information, required to be hidden, in an image. Advanced Encryption Standard (AES) algorithm technique is used to encrypt the information before hiding it. Moreover, a password is AES and be hidden with the information in the same image. The encryption process increases the security level of information transfer. The image that holds both of the encrypted information and password is saved in the gallery to be sent later via email, Bluetooth, etc.

The following diagram depicts the main phases of the application:





Vehicle Speed Violation Detection and Recording Device

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ABSTRACT

Over-speeding is one of the most important causes for large number of fatal road accidents in the UAE. To solve this problem an ever-increasing number of radars have been installed on commonly used roads and highways. While this has helped reduce over-speeding to a certain extent, radars have not proved very effective because many drivers would slow down their vehicles as they approach the radars. In this project, a vehicle speed violation detection and recording device has been developed to ensure that any speed violation along any route in the UAE is detected and recorded without the need for any radars. By installing this temper-proof device in every car registered in the UAE, any speed violation will be recorded by the device and also instantly transmitted to a server providing all relevant information. In other words, the device will act as a “24/7 radar” and discourage the drivers to speed up at any time along any route.

For obtaining GPS data, a GPS/GSM module SIM908 is utilized. For its proper operation in this project, a special power supply was designed and implemented. The SIM908 module was interfaced to Atmel 32 bit microcontroller using Atmel UC3-A3 Xplained evaluation kit. It was also interfaced to a SIM card. Serial communication was used between the SIM908 module and the microcontroller for data transfer. A Secure Digital (SD) card is interfaced to the microcontroller using Serial Peripheral Interface (SPI) for storing the GPS map data including the specified speed limits of roads. This data was obtained using the OpenStreetMap.org website that provides free geographic data including speed limits of roads. For editing the OpenStreetMap output files, a desk type application named Java OpenStreetMap Editor (JOSM) was used. The device hardware, as shown in Fig. 1 below, has been tested for its various functions and the results are very encouraging.

The complete functioning of the system is explained with the help of a block diagram as shown in Fig. 2. The speed monitoring and recording device is connected to the Internet using GPRS technology in order to communicate with a central server for data transfer. The server has a database that shall contain violation records with complete details about each violation as well as road maps data. Presently, work is in progress to transmit the violation data recorded by the prototype device (vehicle identification, road at which violation occurred, date and time of violation, speed limit, and actual speed, etc.) to the central server. This data will be the same as stored in the SD card of device. Additional work is also being done to make the device more temper-proof. It is also planned to send an automatic message including the information about the location of the vehicle to the server/control room if there is a severe impact as a result of an accident.



Fig. 1: Speed violation detection and recording device

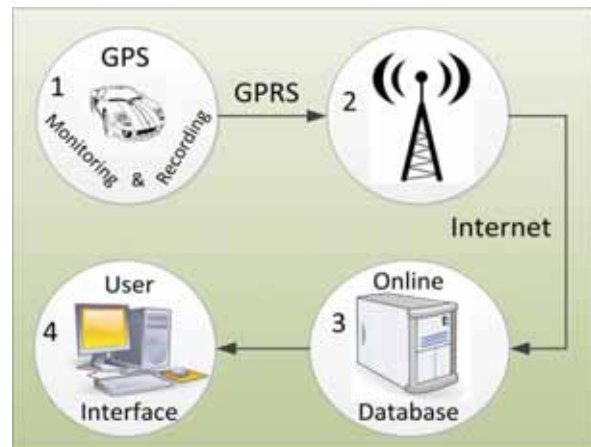


Fig. 2: System block diagram



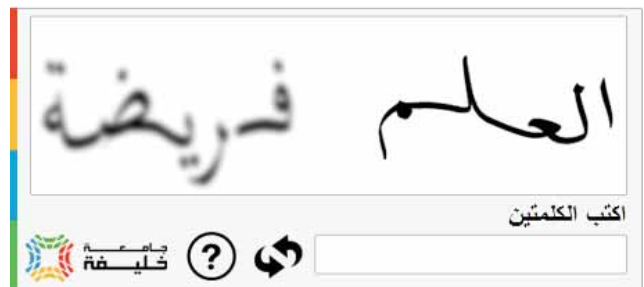
Cloud-based Arabic reCAPTCHA

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ABSTRACT

reCAPTCHA is a web service that helps in protecting online services from being abused by spam bots. More importantly, reCAPTCHA service can be used for enhancing the digitization of old manuscripts. There are many old manuscripts that need to be digitized. Our next generations can view the material of these manuscripts as e-books. Optical Character Recognition (OCR) applications are used to recognize and digitize the words in scanned documents. However, OCRs are not perfect and often fail to recognize many words. As a consequence, the reCAPTCHA service can assist OCRs in recognizing the unrecognized words.



Basically, reCAPTCHA service has been implemented in different languages and it has shown a great success of digitizing around 200 millions words per day. The concept of reCAPTCHA is to introduce two different distorted words to the user. These two words can be categorized as a known word that has been recognized properly by an OCR. In addition to an unknown word that has not been successfully recognized. The user will type the two words and submit them. The reCAPTCHA service checks if the known words are entered correctly, then it assumes that the user is human beings, and then it grants the access to the online service. Otherwise, it will prevent the user from accessing the desired service. Afterwards, the user's assumption of the unknown word is recorded and if more users agreed that an unknown word is a particular word, the unknown word becomes a known word and it will be digitized.

There were some early attempts in the Middle East to implement an Arabic based CAPTCHA service to protect web sites, but none was implemented for reCAPTCHA for the purpose of protecting online service and at the same time helps in digitizing Arabic manuscripts. In this project, we design and implement a cloud-based Arabic reCAPTCHA which can be used by millions of Arabic-language web sites. Our ultimate goal of the project is to implement a reCAPTCHA service for Arabic language. The service is going to be hosted by Amazon Web Services (AWS) where all the needed tools to build the suitable environment for the project are available. In Amazon Web Services, it is possible to create virtual servers in order to host the reCAPTCHA service and databases as well. The way that you pay for the cloud service provided by Amazon is much reasonable than buying an actual server which are quite expensive. In addition, choosing the right specification of the machine and the tools needed to develop this project are much easier in Amazon cloud for the various platforms available for developers.



Free E-pharmacy software application

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ABSTRACT

A lot of people nowadays are using a huge amount of medicines and others left their unused medicines until they are expired and threw them away. Some hospitals face problems in lack of medicine needed for their patients and they request from the NGOs and demand them to collect a certain amount of specific medicines. This problem leads to the death of many poor and needy people.

On the other hand, the price of medicines rises sharply every day and poor people cannot buy what they need. In Egypt, the lack of medicines may cause the death to thousands of the Egyptians especially those who have chronic disease. The problem in Egypt is about the poor people who cannot pay in order to get their medical care. Also many countries outside Egypt face the same problem especially in Africa and Asia. The poorest parts of Africa and Asia have not been altogether without medicine. Healing center drug stores in great towns have essential stocks of more senior pills, granted that they will run out. But that as it may fresher solutions for tumor, asthma, diabetes or heart failure that safeguard exists in Europe are either non-existent or expensive.

This topic is important especially in Egypt because there are many poor people that they cannot get their medical treatment and this will help many of the needy to get their medicine either free or with low prices.

By spreading this issue and making similar cases to it will help in a huge part solving the problem. Instead of throwing the medicines or leaving them until the expiration date, another poor people can benefit from its use. Finding a solution for this topic will help in other countries that face poverty especially in Africa and Asia where there are more poverty and lack of medical care.

A software application that has both web and mobile interfaces. That application might be utilized by a NGO, administration clinics, or standard residents to aggregate such pharmaceuticals and circulate those needy as per particular overseeing runs the show. Distribution of the gathered medicines may be physically from cooperating drug stores, healing facilities, and NGO stores. On the other hand, the appropriation may be virtual utilizing mobiles. A person, who has a prescription that is no longer required, can send a structured SMS to the framework to record this qualified data in the database. Another needy individual who is in need for such a medicine may have posted his need earlier for this same medicine. If it happened that both individuals are in close neighborhood, the second person is directed through an SMS to the first person.

The application that will be executed on Android and web based platform aims to be easy to be used by different types of people. So, if somebody don't know how to use the internet or don't have a computer he can use the mobile based application in order to access it and otherwise. By applying this application in many places and countries it would help in reducing the percentage of poverty and lack of medicine in the poor countries. There are already some similar applications but it needs to be more developed with some new features with adding some new technologies.

References:

- 15 pinherio. CP. 2008. Drug Donation: What lies Beneath. Bulletin of the World Health Organization.
- WHO Model List of Essential Medicines, 16th list. Geneva, World Health Organization, 2009.
Available at: <http://www.who.int/medicines/publications/essentialmedicines/en/index.html>



Private Online Sale System

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ABSTRACT

The “private online sale” project consists in building system for private sale. The private online sale is one of the online sale types, like a common shopping website but with a special idea. The concept is based on the online purchase at reduced prices for products in a specific period.

This kind of sale has given the companies much more opportunities in increasing the purchasing power for the store and its publicity. Also it helps the store to discharge the repositories within a short time with a good profit. As additional advantage of the private sale website for people that can't visit store, they can buy from their home through the website and may take advantage of the attractive price of products.

To get all these benefits in Saudi Arabia we designed and developed a private online sale system, which was our BSc graduation project. This project is a web-based system dedicated to support each Saudi business aims to increase the purchasing power.

In fact, the private online sale system presenting a new offers from different brands, the products should be with attractive prices and these offers are available for a short time. It represents an exclusive discounts they won't find offline. These temporary offers reserved for people who have previously registered on the website. Only registered customers have unlimited access in the website. Also, they will be informed about new offers through an email automatically sent by the system. In addition, each registered customer has an account contains his information that can be editing or updating. This account is also used to complete the procurement process and manage his orders. Moreover, the website provides other features for the customer such as invite friends to the website, add comments about the system, also he can view the comment of other customers and communicate with the customers through social networking sites.

The website has simple and clear interface to be easy for customer to review the products and to complete the purchase process. System classifies the products by the traditional categories such as man and women to be easy for customer to brows the product, also there is other classification by brands name. Customers can see the time remaining of the end of the offers for each product. If the offer time is over then the system will remove product from the page, also if all the quantity of product are sold out then a message sold out will appear above the product. The system doesn't allow to the customer to keep any product in his basket more than one hour, to give another people a chance to take advantage of the attractive price of products.

As result, private online sale system gets great benefits for brands owners and for customers, especially for people who are interesting with style and fashion, they can find products they need it with reduced prices. Also the system helps the people can't visit the store for a different reason. In addition, the System reduces time and effort for customers when they search for special discounts, because they can find a lot of offers in one place.

As for brands owners, they can get new customers who have benefited from reduced price in private sale website, also it increases products sales, revenue and will be more fame.

The system has a centralized database that stores all information related to different products displayed in this website. The implementation tools we used are Microsoft Visual Studio 2010 Professional. For the programming language, we used .NET (ASP & VB).



School Bus Attendance System Using RFID

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ABSTRACT

School bus transportation plays an important role in students' movements as they transport the students to and from their schools every day. School administrator faces many challenges to ensure students safety; it requires them to prepare daily lists and daily check on the students' bus attendance manually. Since not all students go with buses everyday, school transportation officers have to record each student who board in and alight from the bus in the morning and afternoon trips to ensure that every student who got in the bus will get out of it.

This practice is significantly dated, tedious, and it has continuously been proven to be a flawed system since it has the high possibility of making mistakes. It is also difficult for the school administrator and parents to keep track of the presence of their children. Since this presence is out of the school monitoring, it makes the parents have some worries about their children. The problems that normally occur are the possibility of a student who may be left in the bus, and the possibility that the driver does not notice that there is a student left in the bus.

School Bus Attendance System (SBAS) is a web-based system that uses the RFID technology to ensure students' safety by recording their attendance. It has four users: school administration, bus driver, parents and students. The parents and the school administration will have accounts to track the students' attendance status through a website. SBAS has three main devices: a handheld RFID reader (MR608x Series) which will be in the bus, RFID passive tags with unique ID for each student (cards), and a computer device to access the website. When students pass their cards, their attendance status will be recorded every time they get in or out of the bus (as: present/out). This status will be displayed to the driver in the reader's application interface, which is developed using Microsoft Visual Studio C# under .Net framework, connected to an SQL Server Compact. In each trip, the system will count the total number of students who got in the bus. Then, it will compare this total number of students who got in with the number of students who are getting out. This process is done to make sure no student is left behind. Moreover, it will automatically generate alarm messages and a sound in case of a student is left inside. The school administration can track all the students' attendance records and generate daily reports, and the parents can also track their children's attendance records through the website, and if they want they can track them by receiving an SMS message for each trip. The website is developed using Microsoft ASP .Net in C# language connected to SQL Server 2008 R2. The architecture of the proposed system is shown in Figure 1.

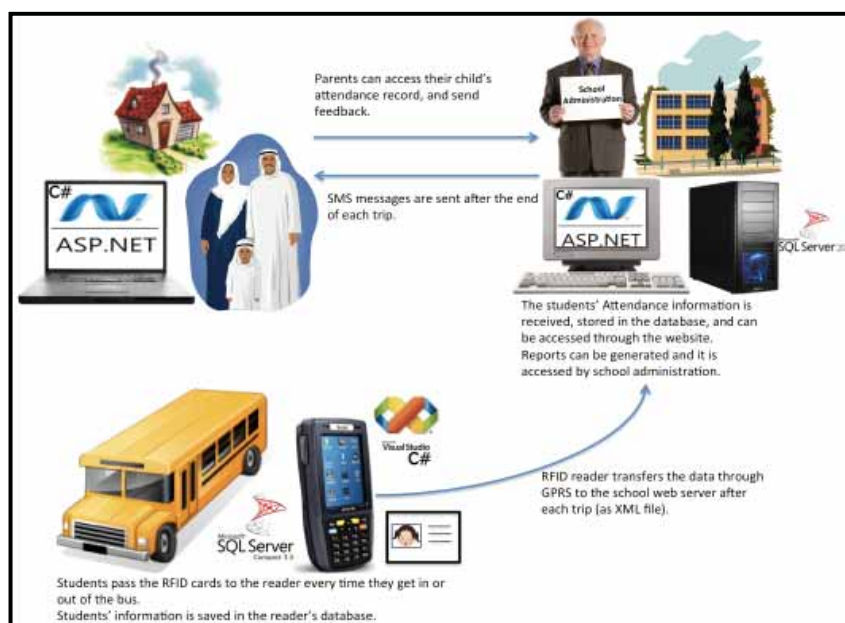


Figure 1: Architecture of School Bus Attendance System.



Traffic Management Social System (TMSS)

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ABSTRACT

The increase of the reliability on social computing applications has been drastically increased in the recent few years. It has been utilized to simplify, increase the communication and to resolve different issues in the society. One of the major problems that cause trouble in transportation is the existence of holes in variety of roads in the Saudi Arabia cities.

A social network application has been proposed to participate in minimizing the load of the traffic and resolving the problem of the holes existence in the roads under the concept of hadith “Removing harm from the road is charity”. Although, there might be several problems that could cause traffic load such as excavation and any harms that might block the road, but TMSS focused in holes in specific to deliver the application to the users in its scope of socialization, where users are usually do not aware of any hole existence and it will exist until the competent agency resolves it.

“TMSS” is considered to be a system that aims to facilitate interaction among the users by notifying each other about the existence of holes where every user can create spot so others can see its information by receiving notifications or exploring the map. “TMSS” contribute to solve the holes problems by sending reports to the Municipalities which in turn will respond to the users complaints and problems.

The system will be built as three-tier architecture as follows:

The presentation tier:

The interfacing of the android application “Faltirha” and the website will be considered as the presentation tier, the application will present multiple functions for the users as follows:

- Creating spots.
- Confirming the spots.
- Adding comments and photos.
- Browsing map.
- Following and unfollowing friends.

and the website will present multiple functions for the Admins as follows:

- Changing the status of the created spots.
- Generating Reports.

The logic tier:

In this tier we will control the functionality by using python programming language that will act as a mediator between the presentation tier and the data tier.

The data tier:

Since the data servers are in this tier, it might be considered as the most important tier where it will enhance the scalability and performance of the application.

Integrating mobile application with social networks to resolve the society problems is a promising area that has been well addressed in TMSS methodology. Thus, activating and implementing TMSS will enhance the roads by reducing the existence of holes, and will create a link between the users and the competent agencies.



Identity Verification System

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ABSTRACT

Identity verification is one of the major issues in security field. The importance of identity verification is daily growing especially for big companies. In order to meet the needs of these companies; we aim at building an identity verification system using powerful technologies such as RFID (Radio Frequency Identification) and face recognition. Our objective is to automate the process of identity verification in order to enhance the accuracy and to avoid wasting time.

Currently used identity verification process rely on the physical presence of one or many employees to check the identity of every passing person. In instance, in the *airport* during the check in, employees have to check out the passport in order to verify the identity of the holder. Moreover, in the *University*, security agents must be available in front of every gate to check the cards of the students and assure that the student whose carry this card is the real owner of it. It is worth noting that in such case, the huge number of students coming every day at the same time makes the identity verification task tremendous and especially inaccurate. Our system will eliminate these problems by automate the identity verification process using some integrated component such as RFID tag, RFID reader, webcam and PC.

Identity Verification System composed of two main processes. The first one is reading the RFID tag information and check if this employee belongs to this organization or not, and the second one is to recognize if that person is the owner of the card. These two processes will be achieved by comparing the getting information with the information stored on the database. The recognition process will be done using eigenface algorithm which is the one mostly used. The system is build using C# .NET in visual studio 2010 and the database is created in SQL server. The application will run on Windows platform. We use the webcam for the face recognition. And the type of reader is Mercury 6.

Until now, we implement the two main processes “Recognize faces and Read tag information”, the face recognition process include three cases of known and unknown persons, in each case the system will generate a specific action. The Mercury 6 reader is running using C# code and it is read the tag information correctly. To get the final result of the system we need just to integrate these two main parts. In addition to these main processes there will be many features such as capture the image from real time webcam and add the capture face into a folder to be processed. Our project also will contain a GUI for the administrator who will manipulate the person information, this interfaces include many functionality for the admin such as (login- view person information, search about specific person and generate report), the information in the report will be use as an attendance for the employees. In addition, the system will include a folder contains a picture for each unknown person to help the administrator to know who unknown person try to enter the organization and at which time.

Hands-free RFID System with RFID Gate reader is the most similar system to our System with RFID and face recognition technologies. It uses RFID gate reader and passive RFID tags inserted on smart card. But our system has addition powerful feature which is add some level of security because of the image processing part. Indeed, our system verifies if the Card's carrier is the real owner.

By using Identity Verification System the verification process will be automatic using many technologies and the currently faced problems will be eliminated. So, the system will help them to save money by reducing the number of security employees, make the verification process fast and accurate, reducing the time spent by the employees to verify themselves. In addition, the system will extend the technology knowledge by integrating powerful technologies with each other to achieve the most benefit result.



My Academic Hints Online (MAHO): A Social Media Site for Academic Interaction and Collaboration at Gulf Universities

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ABSTRACT

Social networking sites or social media have become popular on the Internet and they are attracting the attention of many people around the world. They also have found their way into the academic environment and universities and other academic institutions are increasingly implementing these technologies for different purposes. The aim of this paper is to propose an idea to implement a social network similar to Twitter and Facebook, which is easy to use and popular worldwide. It is social in its idea and content, but can be implemented at an academic environment which aims to help academic community to exchange information, knowledge and experiences.



My Academic Hints Online (MAHO) is a social media tool that is designed to university students, faculty members, administrators, supervisors, heads of departments and other people who belong to the academic community. It will be implemented at Gulf Universities including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab of Emirates. It aims to help universities and users to communicate with each other and exchange knowledge and experiences, to save their time and effort in terms of searching for information, and to keep communication going between universities and other organizations. MAHO will take the advantages and power of social networking and communication.

MAHO is closer to be a social and academic website, as most of its users are professionals and specialists. To take advantage of the website, a user needs to create an account, which is consistent with his/her personal information (name, gender, country, interests, own website and others) and academic information (specialty, university and other information). Once users log into My Hints, they can search for topics that are related to their needs and preferences and follow other news in the same interests. "Hints" of users will be vary and can be in different types such as consultations, experiences, ideas, events, opinions, particular ads and others . The purpose of MAHO is to allow users to write what comes to their minds, to write about ideas, post new information, or to refer people directly to other useful sources.

We believe that MAHO is worth to be implemented and has several advantages. First, it is hoped that this website will create more cooperation and collaboration between Gulf universities and academic community in the Gulf area. Second, it will be unique in terms of the simplicity of the interface design, ease of use, speed of reaction, color consistency and the possibility to copy, delete, search, save and share. Third, to the best of our knowledge, there is no service or tool on the Internet with this purpose, especially at the Gulf Universities level. Finally, to take the advantages of mobile technologies, this idea will be developed on mobile devices and Platforms, to make it popular and widespread.



Automated assignment tool

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ABSTRACT

Manually generating timetables is a difficult task facing different companies, industries, educational organizations, etc. It consumes tremendous amount of time, drains energy and wastes resources. Additionally, it is very difficult to change a specific detail without causing damages.

The college of education at King Saud University has been suffering for many years from the lack of accuracy and conflicts that occurred in the manual creation of the examination timetable. Moreover, it can be difficult to meet college constraints and requirements using manually generated schedules.

In this paper we describe our ongoing BSc graduation project, which consists in solving the problem by creating a tailored intelligent system. This system aims to automatically generate examination timetable, in addition to assign rooms and invigilators to scheduled exams. Our project should create a flawless and accurate timetable as shown in figure 1. The college of education consists of five different departments. Our project will be responsible for:

Automatically generating examination timetable for the final exams in the college of education at King Saud University with respect of their requirements and constraints.

- Managing exams of all levels for each department.
- Assignment of exams to rooms depending on the capacity of the room.
- Monitoring room's availability and capacity.
- Assignment of invigilator to exams based on their workload and number of enrolled students.
- Automatic assignment of alternative invigilator.
- Making sure that no conflicts or error occur during the process of timetab
- Reports will be available after each exam displaying the progress.



Figure 1: simple diagram of the proposed solution

There will be two kinds of reports, a daily report written by the headmaster of each department and a general report which will be summarized automatically from the daily reports of each day by the system for the administrator use. The system will notify the administrator once a new report has been submitted or report changes have been applied. The report will contain absence and late records for students and invigilators. In addition, it will include the names of students who forgot their ID cards or violated any rule during the exam. Examination timetabling problem will be solved using Particle swarm optimization approach. This method has shown its effectiveness for solving large amount optimization problems. It will be applied with respect to the hard and soft constraints of the college of education.

The college of education consists of three thousand students in five individual departments. Each department comprises of eight levels and each level has seven subjects. In order to proceed with these tasks, a sophisticated database needs to be created. Such database will lead to expeditious data collection, validation and retrieval.

As a result, it will be fascinating how our system will be able to transform such a complicated task to be so effortless and systematic in an extremely skillful way. Our system will be constructed so that it can be reused to serve many fields. We are working whole-heartedly to ensure that our system will ameliorate managing departments, mark miraculous improvement in the accuracy of creating examination timetables and will increase productivity of employees.



Smart Integrated Energy Monitoring and Management System of Standalone Renewable Energy Systems

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ABSTRACT

In the last decade, the performance of energy management systems is enhanced by improving their abilities to accurately measure, record, and analyze data. On the other hand, energy management system became more complicated due to the increasing number of sophisticated requirements which are needed to be fulfilled. Although home energy management systems, renewable energy management systems, and smart energy management systems were successfully introduced energy management systems' ability to be efficiently integrated and to be upgraded, are still representing limitations to be overcome. Future energy management systems must be able to be easily applied anywhere and anytime with minimum cost and best quality. The previous goals are steadily achieved by the continuous research efforts to enhance the performance of sensors, to improve the capabilities of wired and wireless communication network, and to develop more efficient data monitoring and management systems. On the other hand, measurement, recording, analyzing and sending data are essential steps which are usually done to characterize and evaluate the performance of any monitoring system and the accuracy of each of these steps determines to a large extent, the conclusions and remarks on the performance of the system.

In the present work we present a smart integrated energy monitoring and management system for standalone renewable energy systems. Our proposed system is designed to have the ability to extend the number of monitored and controlled quantities and to accurately describe the status of the system components through real time monitoring. Based on input data and real-time information provided by the system sensors, the energy consumption of different appliances are automatically controlled and optimized using a hierarchical self adaptive algorithm. In the mean time, the system is designed to allow full diagnosis and management of energy by continuous creation of updated records of all measured quantities. In addition alarming and reminding signals about the system status are also sent to system mentors to take decision if necessary.

The system mainly consists of sensors, the data acquisition card, and the local monitoring and control unit. The sensors transform the changes in the required physical quantities into electrical changes that can be measured and recorded. The data transfer from the sensor circuits to the local monitoring unit can take place over wired or wireless channels. The main functions of the monitoring and management are to accurately control the energy consumption from the system storage unit based on accurate determination of the periods of times at which the loads are required to be operated. Initially, the program is fed with the details load usage time table and with the signals from different sensors. The program automatically reads the date and time from the controlling computer internal clock and the controlling signals from the different sensors are also considered to operate the required loads based on users' requirements. The controlling signals are generated and send to the load driving circuits through the data acquisition card. Based on the knowledge of the switched on loads and the time period at which these loads are operated, and based on the signals received from monitoring sensors, the energy consumed by the loads are continuously monitored and compared with the energy generated from the PV modules at the same time (fig.1).

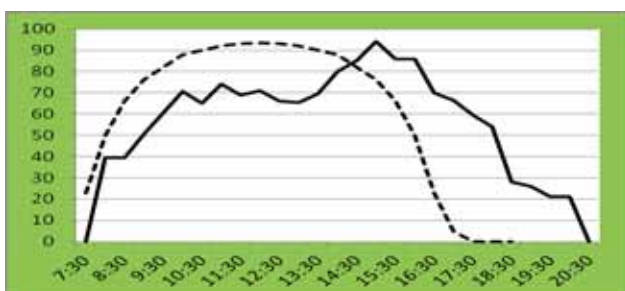


Fig. 1 Total power consumed by the loads (solid line) and power supplied by the photovoltaic modules [12] (dashed line) versus time.

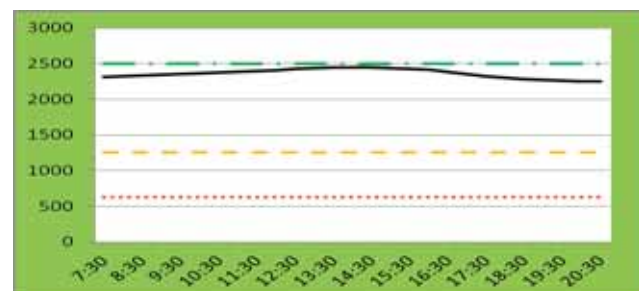


Fig. 2 The total energy stored in KW Hr (solid line) versus time

Based on the previous data, the energy level in the storage units is determined as shown in fig. 2 and further decisions and/or actions, like reduction of loads, are taken. It has to be mentioned that the usage of the standard plate forms and programming environment in our present work make the system flexible to be upgraded to fulfill additional users' requirements.



Shopping Online Securely in UAE

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Supervised by:
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ABSTRACT

Time is becoming an important commodity around the world. It is more important to people who spend most of their in working or running their own businesses and most of them have started buying online than going for traditional shopping methods. They feel that online shopping not only saves them time and energy but also make the world greener. Shopping online is a very convenient way of shopping where the person browses different online line shopping websites by just sitting at a place of their choice.

United Arab Emirates (UAE) is embracing technological advancements very fast and e-commerce is growing in popularity in the UAE with portals such as Souq.com. UAE residents who are involved with online shopping have increased from 29% in 2009 to 42% in 2010 according to the results from a study on GCC retail industry in 2011. Various types of online shopping include airline tickets, hotel booking, electronic products, clothing and accessories, restaurants and home delivery of food, and supermarkets. Although online shopping is secure theoretically there are practical concerns. Also it has been identified through various researches that individual level online shopping in general is determined by the customers' attitudes towards e-shopping and not so much with security concern and the intensity of Internet usage. On the contrary a study conducted by the Massachusetts Institute of Technology in the USA discovered that only 50% of the online shoppers were opting for lower prices while the rest were looking for reliable e-commerce websites which were offering them the trust to make purchases online.

Symantec's annual consumer survey of more than 400 UAE residents who regularly use the internet has revealed that 75% of respondents do not shop online due to fears that the Internet is very insecure. The survey also has shown a shocking result that 78% of respondents who transact online do so with no protection. Stephen Leeds, e-Commerce business leader for Visa Middle East, has rightly stated in 2012 that online shopping is still in its infancy in the UAE region, but he foresees that it would grow steadily due to various reasons some of which are government commitment, retailer investment, the openness to technologies and innovation of the UAE youth population. However there is very less research has been done to deal with these issues in the UAE.

This research will focus on identifying the relationships between concern for security and on-line shopping. The issues of confidentiality, privacy and credibility will be briefly discussed.

Aims and Objectives

The Aim:

The aim is to investigate and identify methods of doing secure online shopping in the United Arab Emirates.

Objectives:

In order to achieve the goal, the research intends to

- Investigate and identify the buying habits of the UAE residents through online media.
- Identifying and analyzing the security threats that may affect people from buying online safely.
- Identifying and evaluating various protective methods to deal with the security threats.
- Proposing effective methods to create awareness about the identified protective methods to do online shopping.

Research Methodology

This research will be using mixed research methods; qualitative and quantitative to collect and analyze data that is available in literature. It will conduct surveys and interviews, and compile, analyze and interpret data in regards to the buying habits on the online shoppers and their knowledge on the various security issues that may affect them.

The result of this research will be helpful for people who would like to embrace online shopping and for the business men who would like to launch online businesses.



Designing Gaze Typing Interfaces and Optimizing Virtual Keyboard Designs: The iWriter Eye Tracking Arabic Augmentative and Alternative Communication System

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ABSTRACT

People with Severe Motor Disabilities need effective means of communication to convey their needs and express their thoughts to others. Some people lose this ability either by injury resulting from trauma or being affected by a disease since birth. Most of them will be labeled as Severe Motor Disability. People with Severe Motor Disabilities such as Motor Neuron Disease (MND), Quadriplegia and Locked-In Syndrome face many difficulties and barriers in using computers and traditional input devices, due to their lack of strength and coordination in using their hands and arms to operate with the standard keyboard and mouse. Therefore, assisting these people to overcome this problem will improve the quality of their life. Motivated by this problem, we assist people with Severe Motor Disability by providing an Augmentative and Alternative Communication (AAC) iWriter system designed for communication in the Arabic language and is operating entirely by eye gaze. It aims to alleviate them from the complexity involved in communicating with manually-operated AAC which require the assistance of a caregiver.

iWriter is an Arabic system that provides two communication methodologies: virtual keyboards and a set of assistive images that illustrate their basic needs. The selection mechanism relies on focusing at the same area on the screen for a specific duration (dwell duration) where a video-based Tobii eye tracking device captures live streams of eye gaze. In order to accommodate a wider number of cases, iWriter considers two different designs of keyboards either standard or vertical keyboard based on the user's disability type. The standard keyboard design simulates the conventional keyboard shape (shown in Figure 1) where an experiment was conducted to evaluate the key's size and the accuracy of the selection process. While on the other hand, people with Locked-In Syndrome often face difficulties in moving their eyes in a horizontal direction; their vision is limited to a vertical eye movement. Therefore, users in this category would require a vertical keyboard design. We propose a virtual keypad design where the Arabic characters are grouped in six sets (shown in Figure 2) and navigation is optimized to three layers. Each set directs the user to its characters arranged in separate buttons (shown in Figure 3).



Figure 1: The standard keyboard design



Figure 2: The vertical keyboard design



Figure 3: The vertical characters design

Comparing these two keyboard designs, the standard keyboard is designed into two levels of depth including word prediction while the vertical keyboard has four levels of navigation as maximum. Observational studies and usability testing sessions have been conducted which compare the two designs in terms of efficiency and accuracy of gaze typing. Key findings demonstrated that the standard design was more efficient and accurate when compared to the vertical structure.



Protecting Teenagers from Potential Internet Security Threats

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ABSTRACT

Teenagers are more likely to fall victims to cyber-security threats through search engines, online advertisements and social networking websites such as: Facebook, twitter, keek and lots of other websites. According to Cisco's annual security report, 91 percentage of monitored hits to web pages were divided between search engines like Google, online video sites like YouTube, advertising networks or social networks like Facebook or Twitter. If the teenager with age of 10 to 18-year-olds using the family's laptop, smartphone to surf the Internet, they are exposed to multiple cyber threats, many of which could be harmful.

Moreover, teenagers do not realize the danger of threats awaiting them and do not recognize that uploading a tweet or photo can impact not only their future, but their safety, as well. Lots of studies which was done by Microsoft shows that 55 percent of teenagers say they give little or no thought to the consequences of posting something online. Some of the popular cyber security threats that affect the teenagers include Social Engineering, Bring Your Own Device (BYOD) etc.

Research Question

This research will answer the following question:

What are the major cyber security threats that affect the Emirati teenagers and how can they protect themselves against these threats?

Aims and Objectives

The Aim

To investigate and identify the major cyber security threats that affect the Emirate teenagers and propose methods to deal with them effectively.

Objectives

The research intends to do the following in order to achieve the aim:

- **Identify and evaluate the internet usage patterns of the Emirati teenagers**
- **Investigate the major cyber security threats that may affect the teenagers and their critical impacts.**
- **Identify and evaluate the anti-cyber security threats to deal with the identified security threats**
- **Propose suitable methods to create awareness amongst the teenagers to deal with the cyber security threats.**

Research Methodology

This research will be using mixed research methods; qualitative and quantitative to collect and analyze data that is available in literature. A critical literature review will be done in identifying the major impacts of the various security threats and effective methods which have been used around the world. Surveys will be conducted to identify the internet usage patterns of the Emirati teenagers, major security threats that affect them and the awareness that these teenagers have to deal with the situations. Interviews will be conducted with security professionals to understand the seriousness of the threats and best methods to safely use the internet.

The methods that will be proposed surely will act like a security blueprint which can be used to create an awareness to safely use the internet. This outcome will not only be useful to the Emirati teenagers but also their parents and educationists.



Smart Technology Devices: Substitutes or Supplements to Books?

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ABSTRACT

The growth of smart mobile technology devices such as tablets, mobile phones and other handheld devices have exploded in leaps and bounds in the recent years. The increased capability of such devices have placed them as a choice of technology for several users particularly college students instead of the traditional PCs, laptops, netbooks etc. Researches have revealed that the smart phones and technology devices have greater impact on the lives of young adults. This includes their social, interpersonal relationships, learning and reading habits.

Most of the popular library sources and book publishers have started creating their digital resources to take advantage of the situation. Educational media has started considering the use of smart devices as a valuable learning tool in higher education. Smart technology device manufacturers have created smart applications and eBook stores which can help download and store books from digital resources. Colleges and universities have started subscribing to the e-libraries and other electronic sources.

With the advancement in technologies higher educational organizations around the world are opting for digital books and electronic resources as substitutes to traditional books. In order to cope up with changing technological advancements, In recent years Ministry of Education and Higher Education in United Arab Emirates have introduced smart devices such as ipad, in schools and college as learning devices to replace the notebooks and PCs. Students have started learning to use these devices for their learning purposes. Educational organizations have started creating and integrating many e-tools for teaching and learning purposes. Since it is new initiative there is no proven research that has been done to investigate whether these technology devices can substitute the traditional books to improve the reading and learning habits of the university students.

Research Question

This research will answer the following question:

Can smart technology devices replace traditional books among students of UAE higher education?

Aims and Objectives:

The Aim:

The aim is to investigate whether smart technology devices can substitute or supplement traditional books. The research will focus on the Emirati university students studying in the Federal Universities in the UAE.

Objectives:

In order to achieve the goal, the research intends to

- Identify the popular smart technology devices that are used by the Emirati University students and their purposes.
- Investigate and evaluate the digital tools used by the identified smart devices to download and read books.
- Study and evaluate the reading and learning habits of the Emirati students using the smart devices.
- Analyse whether smart technology devices can substitute or supplement the traditional books.

Research Methodology

This research will be using mixed research methods; qualitative and quantitative to collect and analyze data that is available in literature. It will conduct surveys and interviews, and compile, analyze and interpret data in regards to the Emirati students learning habits.

The result of this research can help provide an analytical baseline and will serve as a guideline and a roadmap for the UAE educational organizations to decide whether to move from traditional libraries to e-libraries or to supplement the traditional libraries with e-resources.



Diagnosis and Improvement of Visual and Audio Cognition

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ABSTRACT

Using the ordinary manual methods to diagnose and improve the condition, in those who suffer from learning disabilities might be expensive and difficult. Learning Disabilities is divided into two main categories: Developmental and Academic. The Developmental category includes several subcategories, such as Attentiveness disability, Cognition disability, and Memory disability. We shall discuss 'Cognition' in our research, which is also subdivided into: Audio and Visual.

There are several programs that ease this process to both specialists and those with learning disabilities. There are some programs in the Middle East that help disabled undergraduate students in diagnosing and developing their Visual and Audio Cognition. However, there are no such programs written in the Arabic language for university students.

In collaboration with the Handicapped Centre at King Saud University, we have started to establish a program that is concerned with diagnosing and developing Visual/Audio Cognition. It is a program that examines the disabled student from three aspects: Visual and Audio Recognition, in addition to the synchronization between Vision and physical movements. Subsequently, it determines the impaired areas and aims to rehabilitate the disabled for post-diagnosis stage.

We are going to use two approaches for our project, which are structured and object oriented. The programming languages that we are going to use are Php, Html and JavaScript for implementing the website, and objective C language using xcode4 IDE for designing the iPad application.

The program provides a website for the specialist and an iPad application that requires Internet connection for the student who is developing perceptual disability. It provides an account for both the specialist and the disabled student where he is examined through. The specialist will be able to observe and control some options that appear in the disabled account.

In more details: the program provides a default account, which is implemented for the administrator. The administrator is a specialist who is responsible for creating accounts for other specialists, in addition to creating account for disabled students. Whenever a student logs in to his account for the first time; a diagnostic test is generated where the system can set the student's baseline level in the cognitive skills. It generates exercises that are adjusted to the student's level. If the student faced any kind of difficulties during these exercises, he can skip the exercise to another of the same level or get hints to help him in solving. The student cannot move to a higher level until he passes the current level. In the other end, the specialist can observe the student through different models by watching a recorded video of the captured screen, viewing a dynamic chart or a detailed schedule that changes according to the disabled situation and improvement. The specialist can also enable or disable the student from seeing his progress (ex: deactivate the messages that appear after each exercise). The specialist can have access to the student's medical record, which contains his personal information.

In conclusion, we are trying to use what we have learned in our field in a way that could be helpful to our community. So by developing this project we are helping part of the society that suffers from such a disability.



Student Management System: Real-time mobile-based system to facilitate classroom management

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ABSTRACT

Most teachers nowadays are struggling from the lack of communication between them and their students regarding courses; it is impractical for students to go to a teacher's office each time they need to talk, ask or book an appointment. Similarly, some of the teachers do not check their email frequently. Besides that, students face problems following up courses' announcements including assignments, exams and grades. Likewise, teachers find it hard to manage attendance; it takes a long time and effort since they do it on papers where papers might get lost or become vulnerable to unauthorized modification.

As technology is rapidly growing, it becomes an aspect of everyday life. It is engaged in many fields and been shown to be effective in facilitating and enhancing lifestyles. Thus, there is an opportunity to integrate technology in education.

Student Management System SMS is an *online* real-time mobile application running on Android operating system. SMS's main goal is to engage technology with education to improve the education in societies. Furthermore, it offers real-time class management and fast communication between teachers and students.

The application has different view for both teachers and students. Both users should login to SMS to use its functionalities. However, only teachers can register to SMS. Students will have login information sent to their email as they added by at least one teacher. So, it is the teacher responsibility to add courses, sections, and students. The application enables teachers to manage their classroom daily. SMS allows teachers to send student(s) alerts, messages, and reminders for exams dates and assignments. It permits them to add students' grades, and students by their sides are able to view them. In addition, SMS facilitates many teacher daily tasks such as attendance management, where a teacher can mark any student as absent. To keep students updated with courses they take, they have access to all these courses. They are notified when their teachers have sent messages and reminders. Teachers and students would keep in touch by exchanging messages to each other via the application.

Many Android applications targeting teachers and students are found. However, they do not focus on teachers and students tasks along with the simple and direct communication in parallel. They do not address all functionalities provided by SMS. Not only that but some of these applications provide the communication through short messaging service which is not free of charge, while SMS uses Wi-Fi technology. Since smart phones are within reach these days and used to assist in daily-based tasks, it is thought they would be the most applicable way to build SMS upon.

SMS is intended mainly for teachers and students of schools, institutions and universities; it is delivered in a simple language and it is not barrier for any educational institutions to use it. SMS application is considered to be a huge improvement for both local and global education processes. It reduces the time a teacher spends in managing a classroom. Also, it enhances the strength of communication between teachers and students. It is foreseen to support teachers and students in both teaching and learning processes. It improves the quality of learning, cooperates in equipping teachers and students with technological skills, encourages them to be more interactive, and removes the concern of time and location in communication. In fact, SMS is considered a valuable real-time mobile application for the education community and classroom management in specific. Its ability to save time for teachers and student will increase the productivity during the class time. Moreover, it is a great influence for students' behavior toward learning.





Incorporation of human personality types (based on MBTI) in web user interface designs using genetic algorithm

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ABSTRACT

The way of interaction between users and application in this case web application is the interface, we can see in the many web pages the user interface which is designed is based on designer preferences without any attention to users' desire and because of this they may be lost their viewers.

Consideration to users' requirements and demands is the way to improve user interface and accordingly attract more website viewer and service usage which would benefit to finance and popularize of the web pages. Personalize web user interface implementation is recognized as among one of the most interesting research area in the web-based application, since the web design style of each user is different we must to fit interface design model to the different need of user.

Therefore, in this study the researcher is using The Myers-Briggs Type Indicator (MBTI) for determine personality types and its relation with web interface design elements with using Genetic Algorithm to link between. This research wants to incorporate these different factors and investigate to catch a model which has maximum acceptance among them. Despite it's possible to don't find any designing model which has maximum popularity between most of them.

Web interface design for pervasive computing is becoming an area of significant importance within the research area of human-computer interaction and visual interface. Web user interface (WUI) designer have to consider to design user interface based on users demands and wishes and when we faces with many different viewers from different part of work with variety of personality, it is very important to build and design an Interface with most popularity among them. So here it's the problem which the researcher wants to investigate it and tries to accomplish and conduct a suitable model which includes these factors and to incorporate personality types and interface design using genetic algorithm by developing and proof the concept



Game-Based Learning for Arabic

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ABSTRACT

Research findings show that computer games have a significant educational value. For example, adventure games have been shown to develop children's strategic thinking and planning skills. Our research addresses the development of an educational game intended for K-3 children.-By playing the game, the child acquires linguistic skills without any external help. Our approach consisted of several stages. Initially, to appreciate the import of games, we conducted two surveys and we investigated several educational games.-The first survey was used to assess the level of acceptance of educational games within the UAEU student population.-The second survey was targeted towards identifying game types, characters, and environments that children prefer.-This survey was administered to K-1 students in an Al Ain school. Additionally, we surveyed several successful educational games for children to extract their essential features.-One major feature of these games is the support for interaction with and manipulation of objects. Such a feature is an effective way to support children learning. Because of our emphasis on K-3 children and how they would learn the Arabic (or any) language, we investigated issues revolving around the selection of an appropriate K-3 "sub-language". Thus, our second task involved the comparison of school curricula from Japan, Egypt, United Kingdom, and United States and the selection of frequent vocabulary to synthesize a core curriculum for an appropriate language arts curriculum.-This core served as a basis for building a curriculum for teaching the Arabic language in our educational game. Based on this core, we constructed a conceptual map to structure linguistic knowledge exploration. Finally, we implemented a game through which a player, through exploration of authentic spaces, can learn the alphabet, vocabulary in its semantic context, and sentences.-This implementation was migrated and tested on various platforms and devices (e.g. Windows , iOS and Android).

What is different in our project than any similar solutions available?

- Our project attempts to allow children of various backgrounds to acquire linguistic skills without the need of any teacher.
- Our framework supports learning of any language (the prototype uses Arabic).
- Our game can be played on a wide variety of devices.
- The availability of our system constitutes an effective learning complement for children in disadvantaged countries.
- Our application combines Fun and Education. In order to achieve that, we focused on several things. Since children learn more through sensing their environment and finding the relationships between its components, we intended to create an authentic environment that matches the real environment that the children live in. Moreover, we added interaction challenges beside the intellectual challenges to add more fun. We did pay attention for the children abilities so they can overcome those challenges. Also, we searched and surveyed about children preferences to ensure that they will accept our Educational Game. We made our educational game suitable for different ages by increasing the challenges slightly in each advanced level.
- In addition, our application mainly focuses on the great targeted learning outcomes. Therefore, we made a curriculum for learning the Arabic language by providing Systematic Learning Process that follows Systematic Learning Curriculum.



Student's Attendance Monitoring System Using RFID Technology

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ABSTRACT

Students' attendance has been a university requirement for many decades because most of the learning process happens in class; listening to the lecture, doing reading assignments, etc. However, the availability of lessons online for most courses makes students less motivated to attend lectures, which badly affects their academic performance. Therefore, monitoring students' attendance is crucial in supporting students' retention and performance.

In the Information Technology (IT) female department at King Saud University (KSU), the manual procedure to take students' attendance is performed either by calling students by name and marking their presence on the attendance sheet, or by passing the students' attendance sheet to sign it. Unfortunately, these methods are often time-consuming, error-prone (the former), and subject to cheating (the later). Also, the loss of the attendance sheet may yield to inaccurate data, and non-regular students may have the chance to avoid punishments (e.g. being banned to attend the final exam). Furthermore, analyzing manually students' attendance sheets by the instructor to determine cases of students who exceeded the allowed percentage of absence and report them to the administration can be time-consuming and error-prone.

Therefore, we propose to develop a web-based application, called RFID-SAMS (RFID based Students' Attendance Monitoring System) that will automatically record and manage students' attendance in the IT department at KSU. RFID-SAMS will use Radio Frequency Identification technology that uses radio frequency electromagnetic fields for the purposes of automatic identification and tracking. The technology is made of three main components: RFID tag, RFID reader, and antenna. Each tag has a microchip inside it to store data -student ID number- that reflects the wave with the information from the microchip that comes from a RFID reader. Each student will be assigned a RFID tag. Classrooms will be equipped with RFID readers. When the instructor wants to take the attendance, she activates the RFID reader and asks students to place their tags near the reader. The reader will automatically retrieve the data from the tags then send the data to a central database in a remote server, over the Internet, and then the students' attendance status will be updated. The database will be connected to the website, which keeps record of the students' attendance in all classes in addition to other functions. The system architecture is depicted in figure 1.



Figure 1 RFID-based SAMS Architecture

RFID-SAMS will target the following users: instructors, students, and makeup exam committee. Instructors will be able to monitor automatically the students' attendance for all taught courses, and they will be provided with statistics that shows the relationship between the students' attendance and their academic performance. Furthermore, RFID-SAMS will allow students to check their absences records and will notify them by email if they are close to reach or exceeded the limit of absences. As for the makeup exam committee, the system will generate reports about non-regular students who are not eligible for the course final exam. RFID-SAMS will be implemented using the following technologies: HTML and CSS for designing interfaces and ASP.NET C# for implementing functions and RFID reader integration. Also, Microsoft SQL Server will be used to design the database and apply queries.

To conclude, we hope that RFID-SAMS will provide the IT department at KSU with a better management of students' attendance as well as helping them to correlate students' academic performance and their commitment to their courses' lectures.



E-voting: Using Fingerprint in Voting Process

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ABSTRACT



e-voting is an electronic voting using fingerprint device in election process, As Election is one of the fundamental instruments of democracy in any region of the world it is to change the traditional elections that accrue on it a lot of problem as it allow the users (Voter/admin) to register for election, voting and Counting process can be accruing automatically. Hopefully To be ensuring that no voter can vote more than one time .as it is electronic so it will decrease the number of the member of judiciary, ministry of interior and the poll workers. Save the amount of money that spent on the election process. Decrease the time that take for registration, voting as the polling station will be more organize and counting process. As the finger print and national id saved to database, I plan to use this database on different type of Organization and also to help on the ceramal.

Traditional election causes a lot of problems with polling station, with voters and counting process. It is easy for anyone to use another one identity to vote with it for Vested interests. Voter had to do a lot of thing to make their vote which waste the time , Also another problem can be with the ballot paper as it easy to play with it for any Vested interests. Finally counting process take a lot of time that may be 3to 4 days, a lot of people work during this day,

The software technologies used to implement the proposed solution include c# windows application, SQL server for database and fingerprint device. It will be two modes network that will be online and offline with database server. In order to make this application such as one we have presented i design use case diagram for the user (Admin/voter).Admin is the user that responsible for add and update the voter fingerprint and National ID, also to check the result of the election. Voter have two thing to do first is to make registration process and I have a several solution for this process start with citizen that want to get or renew their National ID, passport, License and etc. also citizen that have child first year on school or go from school/university to another one, finial no citizen can vote unless must registered with fingerprint. After that user have to login to application first by but his/her finger that enroll with it on the finger print device to check if the user allow to vote in this polling station or not and also if the voter make pre-vote or no. after that user can chose his/her candidates . Functional requirement is that the system should show the candidate picture; show the result of election on graph. Nonfunctional requirement is that the system should be beneficial for extensive list of security requirements such as confidentiality, integrity, authentication, and verifiability.



A Water Quality Monitoring System Using Wireless Zigbee Networks

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ABSTRACT

In UAE, the quality of conventional water resources (groundwater) is deteriorated due to the imbalance between the input (scarce rainfall) and output (increasing consumption) of the groundwater system. Desalination and wastewater treatment plants (non-conventional water resources) have been widely established to cover the shortages of conventional water resources and to meet the high demand of water for domestic, agricultural and industrial purposes. However accurate monitoring of the quality of the desalinated water, treated water, and waste water produced by these plants is a must. Due to the enormous number of conventional and non-conventional water resources in UAE and due to their widely spread all over the country, the fulfillment of the previous water quality monitoring requirements using conventional sampling and laboratory-based techniques is difficult, expensive, and unreliable. In the last decade, intelligent monitoring systems were introduced by utilizing the achievements of research efforts in enhancing sensor and network capabilities, communications technologies and data delivery formats. For example, wireless sensing systems offer the potential to reduce the system cost considerably, as well as to provide more useful, continuous monitoring capabilities by giving an accurate idea of the changing environmental and water quality in real time. On the other hand, the availability of spatial and temporal variations of the different water quality parameters allows more accurate and specific interpretations.

In this paper, we introduce a water quality monitoring system using wireless Zigbee networks. The basic building blocks of our systems are the hardware sensing circuits, the wireless transmitter and receiver, the hardware interface circuit, and the monitoring and control software environment. The hardware sensor circuits will generate the calibrated output voltages which are proportional (correlated) to the variations in the measured physical quantities (figures 1 and 2). This data are transmitted wirelessly through our designed Zigbee transmitter/receiver and encoder/decoder circuits. The function of the interfacing hardware is to latch the data received from the receiver to the computer for further data recording, processing, and analysis. Our designed hardware circuits are interfaced with our computer using standard data acquisition card (DAQ). After the DAQ latches the measured signal in a suitable form to the computer, an efficient software program (LabVIEW) will be implemented to monitor, record, and display the data in a form that can be easily accessed by the interested users (fig.3).



Fig. 1 Conductivity and temperature sensors

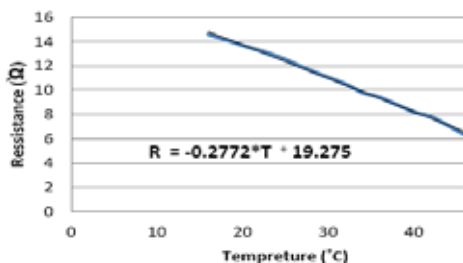


Fig. 2 Temperature sensor calibrated equation

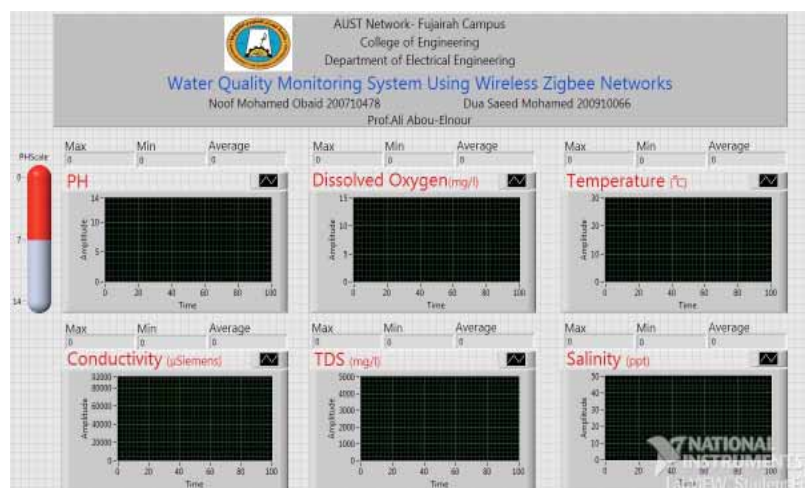


Fig. 3 Front panel of the monitoring unit

It has to be mentioned that based on the user's requirements, the capability of our proposed monitoring system can be further enhanced to handle more input (analog input, digital input) and outputs, to recorded additional files or display additional graphs, using available wireless cellular network facilities for data transmission.



Prediction of Biogas Generation Profiles in Wastewater Treatment Plants Using Neural Networks

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ABSTRACT

Treated wastewater consists of solids called waste activated sludge (WAS). WAS is treated through anaerobic digestion processes that are known as controlled system emitting low levels of gases into the atmosphere and generating biogas of 60% methane content. Methane is a combustible gas and an excellent alternative source of energy for non-renewable fossil fuels. In order to accelerate the bioconversion of biosolids or WAS, the pre-treatment of sludge prior to digestion processes is recommended as an effective technique for improving the biogas generation. Even though anaerobic digestion processes of WAS have the advantage of producing green energy, they are not widely utilized by wastewater treatment plants worldwide. The narrow utilization of the anaerobic treatment of WAS is mainly attributed to the lack of a practical approach to predict the rate of biodegradability of organic matter and hence the rate of biogas/methane production.

Ultrasound pre-treatment as a physical pre-treatment technology has been specifically employed to solubilize flocs, enhance the hydrolysis rate and consequently improve the biodegradation rate of sludge which is known as an important challenge in characterizing pretreatment impact on WAS biodegradability. The biochemical methanogenic potential (BMP) test is used to measure the methane generated gas in the headspace as an indicator of biodegradability. The test is conducted in sealed serum bottles and was found to take about 50-70 days to reach a stable level of accumulated methane. This makes the assessment process time consuming, expensive and in some cases impractical (Kianmehr et al. 2012).

A research project has been conducted to investigate the impacts of ultrasound pre-treatment on a wide range of WAS samples generated using three sequencing batch reactors (SBRs). The WAS samples were pretreated by sonication in a bench scale apparatus and a wide range of ultrasound intensities was applied. The BMP test was conducted for raw (without pre-treatment) and pre-treated sample and methane generation was observed for about 50 days. Further details regarding the methodology have been provided by Kianmehr et al. (2012). The total solids concentration (TS), chemical oxygen demand (COD) and total kjeldahl Nitrogen (TKN) of the sample were measure and they were fractionated into volatile dissolved solids (VDS), filtered COD (FCOD) and filtered TKN (FTKN) representing the fraction of organic matters that were solubilized. A correlation between these typical solubilisation indicators and rate of methane generation are logically expected while such expected correlations were not described by simple mathematical or graphical comparisons. The general objective of this research is to develop a practical tool to predict the rate of methane generation without requiring further BMP tests.

The investigation of the methane profiles produced from BMP tests was based on Artificial Neural Networks (ANN). ANN was utilized in this research due to the highly complex relation that exists between the four studied parameters (Sludge SRT, VDS, FCOD and FTKN) and the rate of methane production. The target of this research is to study the efficiency of different combinations of the four studied parameters in predicting the rate of methane generation. Feed-Forward back-propagation 4-layer neural networks trained based on Levenberg-Marquardt algorithm and validated based on the mean-squared error were utilized in this research. A conservative approach was taken for the testing stage of each of the combinations. For every combination of parameters, different networks were trained each isolating a set of data having the same SRT. The performance of every network was then assessed based on its accuracy in predicting the results of the isolated set. This testing methodology would be one step towards generalizing the prediction capabilities of neural networks to SRTs not covered in the scope of this research. The generation of all networks was automated using MatLab scripts.

Preliminary results of this research were promising showing that not all of the studied parameters are needed for the prediction of methane profiles. In fact, the results showed that some parameters, when present together yield distorted predictions; however, when those parameters are isolated, accurate predictions are obtained. Such interference between parameters was observed in the case of VDS and FCOD. Networks having either of those parameters within their input parameters are capable of accurately predicting methane profiles; however, networks having both the FCOD and the VDS within their input parameters yield distorted results. Preliminary, results also showed no importance for the FTKN parameter in the prediction of methane profiles.

References:

P. Kianmehr, W. Parker, and P. Seto, 2012 (Sept.), Assessment of WAS Pretreatment by Ultrasound and Applicability of Biodegradability Indicators, Journal of Environmental Engineering, ASCE, Published online bdoi: 10.1061/(ASCE)EE.1943-7870.0000657.



Albateel: A Micro-Adaptive Application for Improving Linguistic Skills for Arabic Language Learners

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Supervised By:
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ABSTRACT

“Albateel” is an Intelligent Tutoring System that aims to improve students’ Arabic linguistic skills by taking each student’s individual needs into consideration to produce efficient learners in the classroom. The motivation behind it is to allow electronic education to incorporate the value of the interactivity afforded to a student by an actual human teacher or tutor. For centuries, textbooks delivered all students the same content in much of the same way. However, each student is unique, ever changing and growing, and no two students learn in the same way. These differences between students’ learning levels present one of the most important challenges that face teachers in the classroom, since some students need to make more effort than others in order to learn, and that makes it challenging for the teacher to manage the variant levels in one classroom. This becomes especially difficult when a student has a learning difficulty (e.g. dyslexia).

Many software programs and applications have been made in all languages to help students learn faster and more efficiently, but there are not many applications available for improving Arabic linguistic skills. Our project intends to fill this gap by helping elementary students of the fourth, fifth and sixth level in learning Arabic linguistic skills in a simple and fun way, using stories, exercises and games. This tool is based on educational theories of cognition and learning which we gathered from a special education expert. Implementing these theories can be facilitated through the use of adaptive learning technologies, namely the Micro-adaptive approach.

The Micro-adaptive approach requires that the educational needs that emerged during the learning process be used to adapt the learning path. The needs are examined and the system responds to them with a redefinition of the path and then, with the redefinition of the sequence of activities to which the learner is exposed. The performance is observed by measuring the outcomes of the assessment test and response time.^[1] In Albateel, the system initially collects data about the student working with it using a screening test, which consists of questions that evaluate different linguistic skills according to the student’s level. Consistent with the test results, the system adapts the exercises in each skill to the student’s level based on their performance. This is done by varying the number and the difficulty of the questions given, starting with easy questions and continuing gradually until the student masters the skill; which is determined using metrics to observe the performance, such as number of questions given, response latency and error rate which are provided by experts in the education field.

The application will be accessible by children easily: the interface is in Arabic, and the information is presented in multiple formats, such as text, animation, and sound. The system enables the students to create an account, view and edit their information, take a screening test, and access lessons and games. Teachers are also able to create accounts and view or edit their information, and the system enables them to view a list of their students and classrooms, as well as display a report for each student’s performance.

Adaptive learning can offer great advantages in providing students with specific and personalized knowledge as and when is required, and we hope to accomplish that with our application. We are still in the developmental phase on Albateel, and we hope to test it out in the coming months in three different schools in Riyadh. After the testing phase, our experts will analyze the results, and provide us with feedback on any system problems, and we will then fix them accordingly.

^[1] Ardimento, Boffoli, V.N. Convertini, & Visaggi. Decision table for adaptive e-learning systems . *Education in a technological world: communicating current and emerging research and technological efforts*. Bari.



MobileRescue: A Collaborative Smartphone Application for Emergency Services

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ABSTRACT

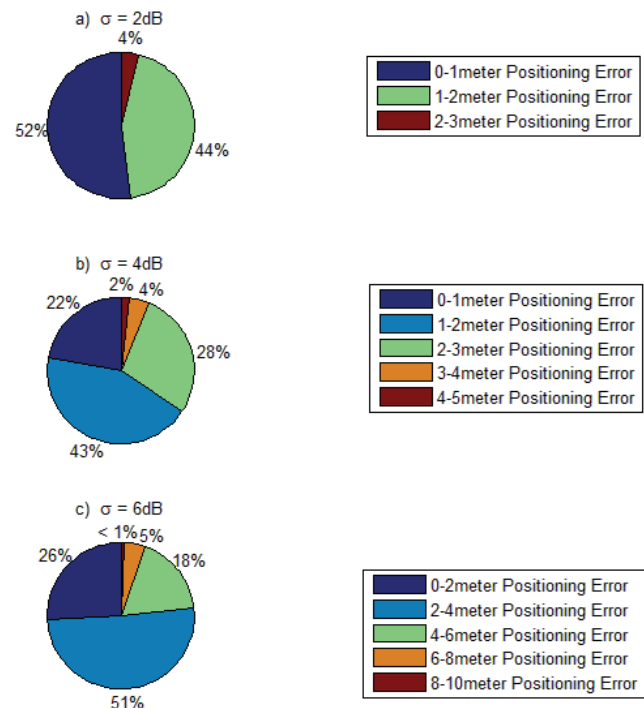
Mobile device localization and location-based services have become essential in our lives. The use of Smartphones, which mostly include a GPS receiver and a Wi-Fi transceiver, has grown rapidly in the past few years and is expected to grow dramatically in the near future. However, since the GPS receiver requires line-of-sight communication with the satellites, it can work efficiently only outdoor or, where there are no obstacles that may block the GPS signal.

Given that a natural disaster, such as an earthquake, has hit an area damaging the buildings and dismantling the communication systems. A survivor, who is stuck under rubble, might be injured or unconscious and in need for immediate help. Even if his or her phone is programmed to detect such situation and attempt to call the emergency services, the malfunctioning infrastructure would prevent that. Even if the phone manages to capture a signal to make a call, it will be almost impossible to determine its location under rubble. In such situations, the search and rescue personnel struggle to find survivors, locate them, and save their lives. Without knowing that there is a survivor who is need for immediate help or not knowing his or her exact location would make the rescue process harder and more time-consuming. Nonetheless, if the survivors and the rescuers have our application running on their Smartphone, the story would be much brighter; we believe.

The application can make use of the embedded sensors in the survivor's Smartphone, such as the accelerometer, microphone, and/or camera, to detect the emergency situation (or per the user's request). On the other hand, the rescuers start the application in their Smartphones, which allows them to establish an ad hoc network and start sending rescuers' beacons and searching for help beacons. Each beacon includes the unique identification and the location information of the sender device, whenever available. As soon as the survivor device falls within communication range of the rescuers' network, it joins the network and starts collecting the location information and the signal strength of each rescuer's device. This information is eventually used by the survivor's device to estimate its own location relative to the rescuers'. For location estimation to be accurate enough, at least three different rescuers should be in range of survivor's range of Wi-Fi communication.

The proposed algorithm is based on well-known communication models and its concept was proven via computer simulation. The results demonstrated that, under reasonable to harsh conditions, the survivor's location can be estimated to be within 1 to 3 meters around the actual location more than 80% of the time; with an average error of 1.25 meters. These promising results demonstrate a good potential for estimating the location of the survivor precisely. The figure shown aside depicts the distribution of positioning error for different practical conditions; represented as random variations in the received Wi-Fi signal.

The next step in this project is to implement the new algorithm in real Smartphones and test its efficiency experimentally in a practical setup.





Thakerny: Voiceprint-Based Software for Dementia Patient

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ABSTRACT

Everyone in this life needs to be heard and have the ability to share his memories and opinions with his family, friends, and neighbors. Nowadays there is an illness that spread all over the world called Dementia which is the symptoms that occur when the brain is affected by specific diseases and conditions.

The solution that can help the Dementia patient, in the early stages of the disease, to recognize people based on their voiceprints, this will avoid embarrassment to the patient and give him more independency. THAKERNY is an application on android smart-phone that contains the following functionalities:

- Speaker recognition functionality which is the main one in the application. In the offline phase of this functionality the relatives' voices of the patient are recorded, then their voice prints are calculated and stored in a database. The speaker is recognized in the online phase, after recording his voice, the voice print is calculated and compared with those stored in the voice print database. The application informs the patient about the speaker by displaying his name and its relativity with him, as shown in figure 1.
- Possibility to locate the patient based on the GPS connected to his mobile phone. This allows the relatives of the patient to locate him when he gets lost.
- Periodic alarm to remind the patient about the application and that he can use it if he needs to recognize people.

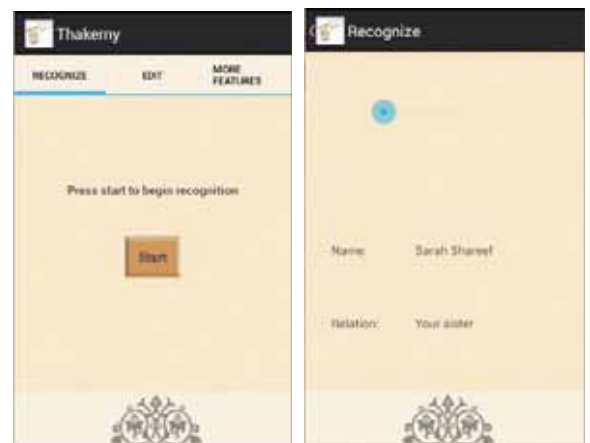


Figure 1: Speaker recognition interfaces

Dementia patient and his assistant can benefit from Thakerny software application. For the patient, the application helps him to recognize his relatives based on their voices. The voice of the patient's relative is recorded when speaking, the its voice print is calculated using MFCC algorithm and VQ clustering method. The calculated voice print is compared with the voice prints stored in the database by calculating distortion. In addition, Thakerny provides a periodic notification about the application every 4 hours. All of these services will reduce the effects of dementia disease. For the patient's assistant, he can add, delete and update all the information of the relatives and also localize the patient when he got lost. Because the application is based on the voice which is highly affected by noise, until now the accuracy of our application is around 80%. The voices of five family members were recorded and their voice prints were calculated and saved in the database, and in the online phase the application was tested by the same family members, four voices were recognized by the application.

As recommendations, it will be interesting to add more services to the application such as giving a notification to the patient about the nearest places, offering the possibility to schedule the patient's routine work and develop this application to be run on different iOS devices.



The Little Builder: A Kincet based Interactive rehabilitation Game for Children with Hemiparesis

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ABSTRACT

Hemiparesis disease is a neuromuscular disorder that affects one-half of the body while the other half remains normal or near to normal. Hemiparesis causes difficulty in movement, perceptual and concentration problems. Virtual-reality (VR) is increasingly used to improve rehabilitation outcomes. The use of VR technologies in hospitals seems to be evolving into the therapeutic tool that it is now being benefiting patients in rehabilitation centers . The aim of this study is to develop an interesting game to assist the physical therapy of Hemiparetic children through Kinect sensor named (Little Builder Game).

The game aims to target Hemiparetic children between six and twelve with upper fine motor motion problems. Basically, the game is divided into two separate games, one is about building a house gradually and the other is painting it. Each of those games will focus on different area in rehab. The building game will focus on stretching the shoulder horizontally and extending wrist and elbow. The idea is about moving the bricks to a different position by the player, by doing so; the patient will extend his wrist and elbow, and stretch the shoulder horizontally. It will have three levels to allow the game get harder (advanced) in movements as the patient status improves. The painting game will



focus on stretching the shoulders vertically.

It has only one level. Its idea is about painting a house. While painting, the patient will adduct and flex his shoulder. The methodology used is the multiple build model lifecycle for game development. The project utilizes certain software and hardware to run the game such as Kinect for windows sensor, PC and XNA game studio. Data is been collected by interviewing and questioning physiotherapists and joiner patients. Also, sensing technologies used in rehabilitation have been discussed, those of which found to be very expensive such as: Wireless Body Sensor Network (WBSN). In addition, sessions of physiotherapy for children found to be not only painful but boring and not stimulating. The idea of creating an interactive game using Kinect for Windows was investigated for two main reasons: First, exploring less expensive measurement tools for rehabilitation sessions. Second, encouraging children to attend their physiotherapy sessions by making their training practice more joyful. The project focuses on the disability of fine motor skills for the upper limbs. To be more specific the Little Builder Game intends to help patients improve the flexion their shoulders and elbows. Finally, the game helps the patients to adduct their shoulders by progressing through the different scenarios of the game. The challenge was to fully understand the disease and, present to the used tool the difference between normal upper-body motion and defected upper-body motion. Another challenge was to identify the progress through the game scoring. Moreover, it was critical to enable the game to accommodate to different levels of disability and motion deficiency, and identify even minor progress done on an individual level.



Proposal of Dynamic Interactive Physical 3D LED Screen (DIP3D Screen)

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ABSTRACT

This research is a proposal for a design of a dynamic interactive physical three-dimensional LED Screen. The design is intended to be implemented in different devices such as tablet PCs, smartphones, and other applications where the use of touch screens is appropriate. Devices with a touch screen are a first choice for most users when considering acquiring a smart device, such as cellular phones and tablet PCs. These devices meant for the ordinary user may not be adequate for people with disabilities, such as the blind and the deaf-blind, who would become secondary users. Many attempts have been made to solve this problem. Some solutions are done by developing applications that assist disabled people [1], while others, by designing user-need oriented devices [2]. However, success of such attempts is limited, mainly due to the way the application works. For example, as the content is being read to a blind person the information displayed on the screen in a text to speech application, is useless for a deaf-blind person [3]. This research proposal however, targets both normal and disabled users for a common solution. The content being displayed on the screen surface is physically made palpable, so that both normal and disabled users can sense the content.

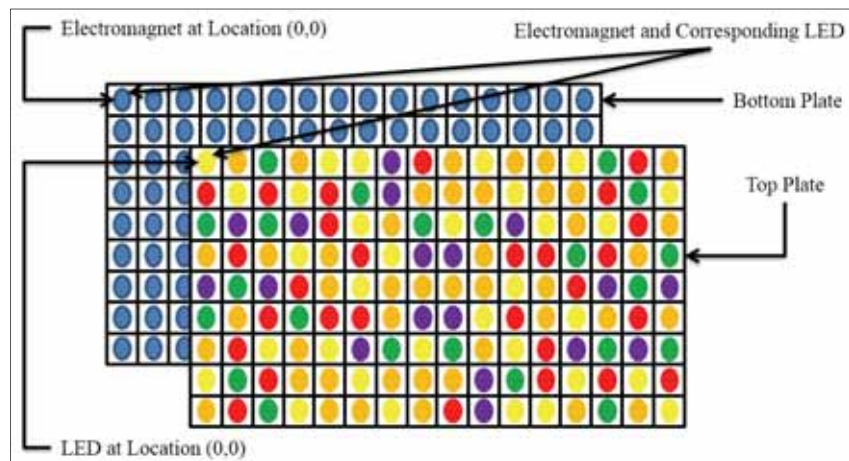


Figure 1: Structure of the DIP3D Screen

A possible implementation of the DIP3D Screen is as follows. The DIP3D Screen will consist of two parallel planes. The bottom plate is a grid of electromagnets and the top one a grid of LEDs. Both plates contain the same number of electromagnets and LEDs, such that each electromagnet from the bottom plate is placed underneath a corresponding LED. Each LED is attached to the corresponding electromagnet (Figure 1). An electromagnet will enable a corresponding LED to have a motion in a direction that is normal to the screen surface allowing the screen to form bulges on its surface. The smallest possible bulge will be formed using a single LED. The height of a bulge can be controlled by the amount of power supplied to the electromagnet forming that bulge. The maximum height of a bulge will be limited due to the hardware structure proposed.

A second implementation is to allow each LED to conduct a small amount of electrical current, enough to be sensed by the user, taking into consideration user's safety measures. To form a screen, a grid of LEDs similar to the top plate (Figure 1) will be used. Each LED is to be equipped with the characteristic previously mentioned.

Both implementations will enable the user's finger to sense a certain pattern when touching the screen surface, as is the case with a normal keyboard. Any of the proposed implementations will form a tremendous amount of 3D shapes, such as alphabetical and Braille letters.

The research is still in progress, and the touch technology that will be used in the DIP3D Screen is being studied. Once this research is completed potential benefits include, reducing typing errors, ability to type numbers without the need to look at the screen as letters and numbers will be physically represented on the screen surface. It will also open the door for the disabled people to use the internet, read, and send messages using devices such as smartphones and tablet PCs.

References:

- [1] Voiceover app by Apple, <http://www.apple.com/accessibility/voiceover/>
- [2] Braille E-Book, <http://www.yankodesign.com/2009/04/17/braille-e-book/>
- [3] Example of limitation of current apps, <http://www.youtube.com/watch?v=conydrRdehw>



Graphic processors-based high-performance IP routing processing

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ABSTRACT

Due to the continuous vast increase in the Internet traffic, network link speeds and hence routing table size, throughput and programmability have always been the central concerns for modern IP router *designs* since IP lookup engines face enormous performance challenges. Current high performance routers typically use specialized hardware, such as ternary content addressable memories (TCAM). Despite of its high cost, it is difficult to adapt to ever-changing network protocols. On the other hand, software routers offer the best flexibility and programmability, but could only achieve a throughput one order of magnitude lower. Modern GPUs are offering significant computing power, and its data-parallel computing model well matches the typical patterns of packet processing on routers. Therefore, in this project we investigate a new approach to building cost-effective and high-performance IP lookup engines and the corresponding routing table update schemes using Graphics Processing Units (GPUs). Accordingly, in this research we investigate the potential of Compute Unified Device Architecture (CUDA) parallel programming (CUDA-enabled GPUs) model to enable parallel IP lookup on the many-core GPU for IP routing applications. As a first step toward exploring the architecture of a GPU based software router, we will develop GPU solutions for a series of core IP routing applications such as IP routing table lookup and pattern match. Our work suggests that, with proper architectural modifications, GPU based software routers could deliver significant higher throughput than previous CPU based solutions. This idea was proposed after some statistics were done by internetworldstats.com and University of Minnesota, in which Internet, has currently over 1,733,993,741 estimated users, and the US alone during 2008 there was an estimated traffic of between 1,200,000 to 1,800,000 TB/month (Terabyte/month); Such rapid growth in the backbone also produces a massive growth in the queuing of the routing tables; the problem is after we finished the era of GB and entered the era of TB, the CPU is not enough anymore to sand alone in routing the 64 bytes packets of IPv4 and even more in the IPv6 with 128 bytes, so as a solution for that problem a GPU is going to be used with the CPU to fasten the process of the routing tables, as it shown in the following graph that small size of data like the 64 bytes and 128 bytes of Pv4 and IPv6 are preferred to use the GPU + CPU in which (a) is the throughput of IPv4 while (b) is the throughput of IPv6 :

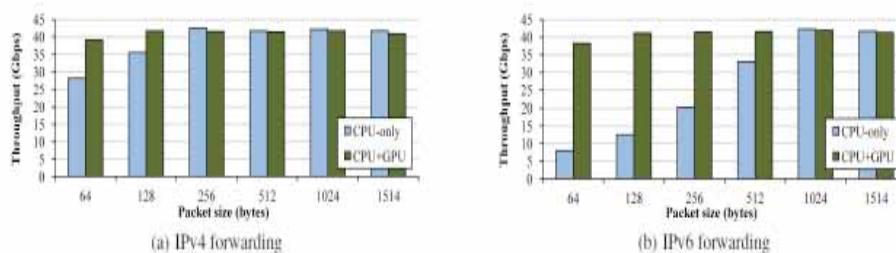


Figure 1: Ipv4 - Ipv6 Forwarding



A Service Oriented Architecture for Advertisement Agency Administration

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ABSTRACT

Despite the relatively short presence of the web, it has had a revolutionary effect on how people and organizations conduct their jobs, greatly increasing the speed of work processing greatly, opening new and imaginative methods of communication and removing barriers to community participation. Web users are individuals each with his or her background, experiences, goals, cultures, interests and abilities in browsing and using the internet from different devices and for different purposes. When it comes to administering an advertisement agency, there are different categories and different groups of people or types of users. They are grouped in a unique manner and are also unique in their demands and required functions. Moreover, for some client companies, it is somewhat difficult to locate a trustworthy advertising company. The concept of Service Oriented Architecture (SOA) is a most suitable approach towards designing an administration system for an advertisement company. A Service Oriented Architecture is a distributed system architecture composed of interoperable services. The use of these services ignores the details of their implementation platform and technologies and thus allowing interoperability and organizational boundaries. We do not need common standards for implementation details, only for conceptual design.

An SOA models systems from the perspective of services offered regardless of the concepts or details of programming. All of the preceding makes it possible to build on existing diverse systems in order to create new services. The proposed system will be able to let the users, e.g. company clients, advertisements designers and managers, perform the following. Clients will be able to go through stored Ads and see the previous work of the agency and what kind of brands the agency made advertisement for, thus adding more credibility and also addressing the fear of the clients of taking the risk and dealing with a relatively unknown agency. In addition, the advertisement designer can look up previous work via enhanced retrieval capabilities to better study previous campaigns and their effect and improve the design at hand. A manager will be able to monitor work and provide an opinion through commenting on the Ads. Choosing an "SOA" in building the framework also allows functionalities to be exposed and consumed via services across distributed or loosely coupled environments and therefore making it easier for web interaction. The tools to be used are C# and Microsoft SQL.



New Egypt: Out & About

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ABSTRACT

Ever since the Egyptian revolution in 2011 occurred, Egypt's economy has been seriously damaged and since tourism is one of the most important and vital in Egypt's economy, it is actually one of the issues that the economy is down. Tourists are afraid to come back to Egypt due to the recent events they don't feel safe anymore. Not only coming to Egypt was an issue but also those who were stuck during the revolution cancelled their trips and went back home. Plus many countries forbid travelers and airlines from traveling to Egypt at those times which struck down the Egyptian economy and until now the after effects of the revolution are still continuing. The big questions here are how to increase tourism? How to encourage tourists to come to Egypt again? To show tourists that Egypt after the revolution has become much more than it used to be before. Media these days doesn't really encourage tourism in fact they never try to mention tourism at all. The Media is concentrated these days on politics and sometimes sports. Although the media can play an important role in improving Egypt's image to the eyes of the tourists but they don't focus on tourism anymore. An action must be taken in order to encourage tourism industry in Egypt before the situation gets more complicated.



New Egypt – out & about is an application operated on android operating system specifically developed for boosting Tourism industry in Egypt. Since android operating system is currently the most used and highly recommended operating system on smart phones it is the perfect system for such application to spread out and prosper in the market. The application is mainly an Interactive map which includes most of the information about old and new Egypt. It helps tourists to decide where to go and what to do next. Tourists come to Egypt each year and each time they see a new place that fascinates them and does encourage them to come back again. But wouldn't it be great to actually visit the locations of the new events that has just recently and still taking place such as the Tahrir Square. New Egypt – out & about contains the function my-to-do list which enables the user to plan his entire visit in Egypt to create his perfect tour in the country. In addition to that is the amount of information about each destination and the events the recently occurred in that area. This application is not only limited to tourists but also it can be used by local residents as well as an academic guide for them it will help them know their culture better.



Smart Home Wireless Voice Controlled Systems

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ABSTRACT

Home automation is one of the major growing industries that can change the way people live. Some of these home automation systems target those seeking luxury and sophisticated home automation platforms; others target those with special needs like the elderly and the disabled. The aim of the present work is to design and implement a system that can respond to voice commands and control the on/off status of electrical devices, such as lamps, fans, television etc, in the home. The present system has the advantages to be reasonably cheap, easy to configure, and easy to run. There have been several commercial and research projects on smart homes and voice control systems. Among the many new communication technologies such as mobile phone networks, wireless sensor networks, Bluetooth, power line carriers and the Internet have been applied to home automation, the wireless sensor systems are now widely used in smart homes and they have become the focus in this field as they provide comfort and home automation, security and safety at home, and moreover remote monitoring facilities.

Although there have been several commercial and research projects on smart homes and voice recognition systems, there is still a need for an integrated platform for home security, monitoring and automation. The present wireless smart home voice control system is an integrated system to facilitate people with an easy-to-use home automation system that can be fully operated based on speech commands. The system is constructed in a way that is easy to install, configure, run, and maintain.

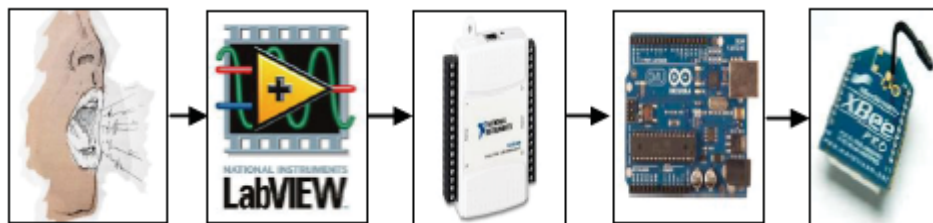


Fig. 1 Voice controlling unit

As shown in fig.1, the voice commands are captured using a microphone and passed to the computer through the sound card. A LabVIEW application program, running on the PC, uses speech library for the voice recognition. Upon recognition of the commands, control characters are sent through wireless communication protocol to the specified appliance address.



Fig. 2 Voice controlled appliances.

At the receiver side, appliances can be turned ON or OFF a relay controlling circuit depending on the received control characters. Additional hardware latch circuits are designed and implemented to allow ON and OFF switching of the same appliance with a certain single voice word. It has to be mentioned that the system was tested and performed well up to 100 m. With a clear line-of-sight transmission, the range in which the reception was accurate extended up to 300m. Additional tests are currently performed to increase the accuracy with more variety of commands.



Wireless Air Pollution Monitoring and Awareness Network WAPMAN

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ABSTRACT

UAE carbon footprint is considered as one of the highest in the world and UAE government is determined to take measures to reduce carbon footprint and secure sustainable future. However, due to the enormous number of conventional and non-conventional air pollution resources in UAE and due to their widely spread all over the country, the fulfillment of the previous air quality monitoring requirements using conventional sampling and laboratory-based techniques is difficult, expensive, and unreliable. In the last decade, intelligent monitoring systems were introduced by utilizing the achievements of research efforts in enhancing sensor and network capabilities, communications technologies and data delivery formats. For example, wireless sensing systems offer the potential to reduce the system cost considerably, as well as to provide more useful, and continuous monitoring capabilities by giving an accurate idea of the air pollutants in real time. On the other hand, the availability of spatial and temporal variations of these pollutants allows more accurate and specific interpretations.

The main objectives of the present work are: (i) to develop a wireless computer based monitoring system which can be efficiently used and integrated to monitor the variations of air pollutants, (ii) to establish an accessible Air Pollution Resource Information Center (Air-PRICE) which contains all data about the spatial and temporal variations of air pollutants in selected sites in UAE, and (iii) to involve the community in monitoring air pollution to increase the awareness of the problems of air pollution sources and their affects on the people life. The system block Diagram is shown in fig. 1. Reliable electronic sensors, which are able to detect the variations of air pollutants, like Ozone and Carbon monoxide, are used to convert these variations in air pollutants into electrical signal (voltage).

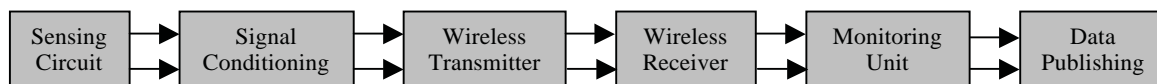


Fig. 1 System Block Diagram

The sensor signals are processed with the signal conditioning circuits and set in a suitable format to be transmitted through the wireless transmitter. The received signals (voltages), which are correlated to the pollutants levels, are fed into the computer based monitoring unit where the pollutants levels are obtained using the following equations:

- (i) For Carbone Monoxide (CO) concentration, the concentration in particle per million (ppm) is given by:

$$ppm_{CO} = 10^{\frac{A - \log \frac{R_L V_{CO}}{R_o (V_{DC} - V_{CO})}}{B}} \quad (1)$$

where A, B, and R_o are sensor parameters while R_L and V_{DC} are circuit parameters.

- (ii) For Ozone (O_3) concentration, the concentration in particle per billion (ppb) is given by:

$$ppb_{O_3} = 10^{\frac{C - \log \frac{R_{o2} (V_{DC} - V_{O_3})}{R_{L2} V_{O_3}}}{D}} \quad (2)$$

where C, D, and R_{o2} are sensor parameters while R_{L2} and V_{DC} are circuit parameters.

The calculated pollutants concentrations are recorded, displayed, as shown in fig.2, and published through wired and wireless communication networks. The objective of involvement of the community in our air pollution awareness network is achieved by communicating with municipalities to compare our data with the ones they have and with health authorities to make use of our measurements in their projects and by taking the feedback of beneficiaries to update our measurement system, to compare our results with the data they have, and to extend the capability our system to measure all pollutants.

It has to be mentioned that the present work allows better understanding of the sources of air pollution and its health impacts on the community. On the other hand, establishment of a database of air pollutants in the selected measurement sites and dedication towards environmental conservation from governmental institutions and officers, local authority officers, private businesses, social organizations and general public are achieved.



Word-Capture Translator Using OCR

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ABSTRACT

Word-capture translator using OCR (Optical Character Recognition) is about an application that will help any reader to understand the meaning of a word, without having to bring a dictionary or surf the Internet. It is an application that can be installed on any cell phone, and will be carried with him/her in any place he/she would go. It is a very simple interface, which anyone who is carrying a cell phone may use. The system will be implemented by using OCR and eclipse. It is a simple system that has only certain functions that the user will be able to use, since in another application called “CamDictionary” has so many functions that make the user get confused and end up not know how to use it. This application will be so easy to use since the users will have to open the application capture a part of the page, crop the word and press on the button that will retrieve the definition or the translation of this word. The application is programmed so that it will convert the image to text using OCR, then compare this text with the words in the dictionary data base, then when it find a match; it will retrieve the definition of it.

The objective of this application is to build a system that will be used as a dictionary that defines a word from language to another and vice versa. While reading, some words are hard to understand. People have to look them up from dictionary, this wastes a lot of time and the interest of the reader and also that many people do not have dictionaries at home. It will make it so much easier for the people who like reading books, magazines and newspapers; since it will save them the time and the energy for understanding the meaning of the words that they are reading. In addition, it will be very useful for the tourists in any country, to read any sign on the street without having a tourist guide to guide them or a little book that translate for them.

This application requires a cell phone that has a camera and an access to the internet, not only WIFI access but 2G & 3G as well. Many people now have smart phones, by this; this system will be useful to so many readers in many different countries. People nowadays like using technology in a way or another. It is more helpful and it saves time for them. Technology helps people to communicate in a much better way; it helps building easy solutions for problems that were not easily solved. In addition, nowadays the software that is being used on the smart phones like Android or IOS makes it easy for anyone to have application on their phones. When this application is implemented, it will lead the reader to be more interested by knowing the meaning faster and be more interested in what they are reading.



A Zigbee Based Wireless Healthcare Monitoring System

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ABSTRACT

In the last decade, the performance of healthcare monitoring networks is enhanced by improving their abilities to accurately measure, record, and analyze data. On the other hand, healthcare monitoring network problems became more complicated due to the increasing number of people who still need healthcare services. This makes the development of a reliable healthcare monitoring system which is able to deliver services to anyone, anywhere and anytime with minimum cost and best quality a must. The previous goals are steadily achieved by the continuous research efforts to enhance the performance healthcare sensors, to improve the capabilities of wired and wireless communication network, and to develop more efficient data monitoring and management systems. In today's healthcare practitioners, doctors need to monitor patients who are either hospitalized or executing their normal daily activities at home or at work but in need of persistent medical care. With the ascent and improvement of wireless technologies, wireless monitoring systems can widely increase our ability to monitor situations of patients in healthcare area, to improve the comfort of patients, to eliminate many medical errors, to increase the efficiency of hospital staff by diminishing their workload to exert their time more on other important affairs.

In the present work we present a Zigbee based wireless healthcare monitoring system which can provide real time online information about medical status of the patients. Our proposed system is designed to have the ability to be extended to monitor all important medical quantities to accurately describe the status of the patients' health and fitness. In addition to the previous advantages, alarming and reminding signals about the patient status can also be send by text message or email report to patient mentors to take decision if necessary.

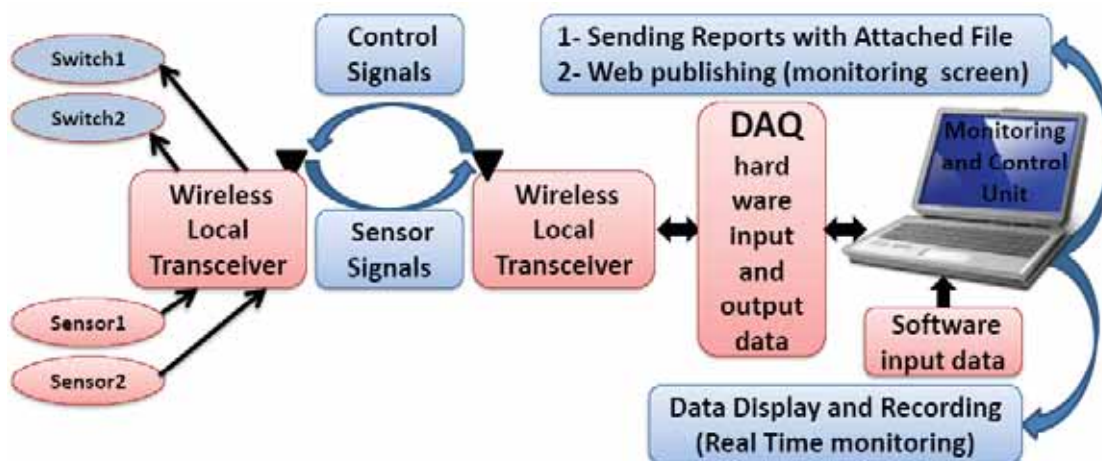


Fig.1 System Block Diagram

The system mainly consists of sensors, Zigbee wireless transmitter and receiver, the data acquisition card which is connected to the local monitoring unit, the programming environment which displays, records, and sends data over wireless communication and internet networks (fig.1). The sensors transform the changes in the required physical quantities into electrical changes that can be measured and recorded. Any transformation function which describes the sensor behavior can be accurately included in our system. The patient's temperature, heart beat rate, and ECG signals are the parameters which are monitored with our present system. Based on the customer requirement, the system hardware can be easily modified to accept any number of inputs from different sensor circuits and the transfer data from the sensor circuits to the local monitoring unit is decided to take place over wired or wireless channels. The flexibility of our programming environment allows the implementation of any monitoring and processing feature on the required measured data. Our system is designed to use mobile communication networking and internet networking facilities to have a low cost networking infrastructure for our global communication channels. In addition to all of the above features, we believe that our careful design of the hardware and software system components allows the fulfillment of any further requirement of any user. Additional tests are currently performed to increase the number of the monitored quantities with the required high accuracy.



Evaluation of Renewable Energy Resources in UAE Using a Cost-Effective Wireless Monitoring System

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ABSTRACT

The design of photovoltaic, solar thermal, and wind renewable energy systems requires accurate assessment of renewable energy resources like the average incident solar radiation, the temperature, and the wind speed in the region at which the systems will be implemented. In zones where the weather is highly localized, like coastal zones, it is difficult to accurately determine the previous parameters with theoretical models. Computer based monitoring systems are considered as reliable systems which are able to determine the spatial and the temporal variations of renewable energy resources in these zones accurately. On the other hand, the availability of accurate assessment of renewable energy resources minimizes the economic risk when implementing these systems.

The aim of the present project is to design and implement an end-to-end reliable system with which one can measure, record, and assess renewable energy resources data at any locations in UAE. Our suggested system is a computer based wireless one which can continuously work without interruptions to generate data which represent the spatial (geographical) and temporal (hourly, daily, and monthly) variations of renewable energy resources at all selected locations. The generated records will be used to assess changes in these resources and to enrich their data in UAE.

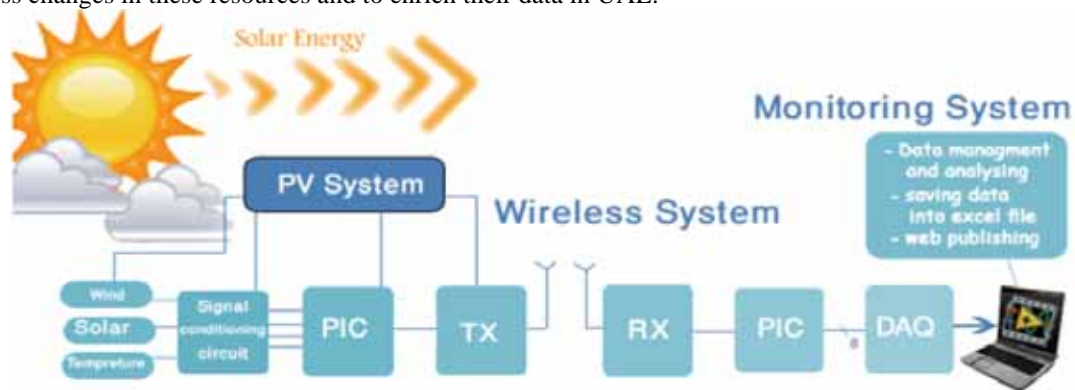


Fig. 1 System block diagram

The system block diagram is shown in fig.1. The system is designed to monitor any environmental physical quantity through sensor circuits which transform the changes in the required physical quantities into electrical changes that can be measured and recorded. Any transformation function which describes the sensor behavior can be accurately included in our system.

Based on the customer requirement, the system hardware can be easily modified to accept any number of inputs from different sensor circuits and the transfer data from the sensor circuits to the local monitoring unit is decided to take place over wireless channel (fig.2). The flexibility of our programming environment allows the implementation of any monitoring and processing feature on the measured data. Our system is designed to use Zigbee wireless communication networking and internet networking facilities to have a cost effective networking infrastructure for our communication purposes. In addition to all of the above features, we believe that our careful design of the hardware, software, and wireless system components allows the fulfillment of any further requirement of any user, ensures the required upgradability to have enhanced performance, and achieves the minimum system cost without sacrificing accuracy.

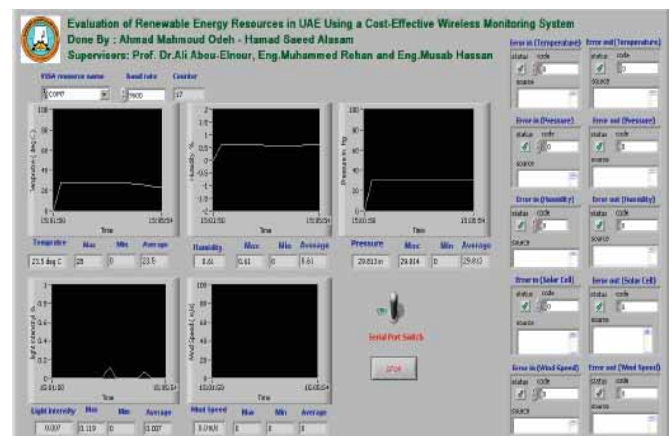


Fig.1 Front panel with different monitored quantities.



Design and Implementation of an Educational Advanced Firewall Simulator

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Supervised by: Dr. Zouheir Trabelsi

ABSTRACT

Nowadays, organizations use security devices, such as firewalls and intrusion detection/prevention systems (IDS/IPS), to protect their data and assets. Firewalls are considered as one of the most important security devices. Commonly, firewalls are used to filter incoming and outgoing network traffic, using a set of filtering rules, known as the security policy and defined usually by security administrators.

Firewall concepts and technologies are nowadays a major topic that should be a part of any information security curriculum. However, firewalls are designed mainly for professional uses, and are not adequate for the academia environment. This is due to fact that firewalls offer functions that are not needed in education and do not allow students to better anatomize the firewall concepts and technologies. In addition, firewalls are usually expensive; however academic institutions have limited budgets.

This project intends to design and implement a new type of firewalls that are dedicated for educational purpose. The proposed firewall is called *Edu-firewall* and offers advanced security functions that are not available in current professional firewalls. In addition, the proposed firewall allows students to better anatomize the concepts of firewalls, specially the advanced ones, such as stateful packet filtering and consistency and efficiency verification of filtering rules. It offers also a friendly GUI interface that can be used to create advanced and low level filtering rules.

Edu-firewall will offer to its users, especially students and educators, important and advanced features which are not available in professional firewalls, mainly:

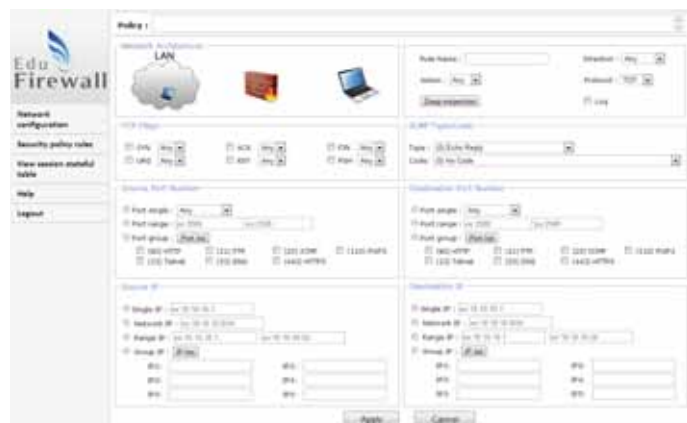
- Consistency and efficiency rule verification (shadow, contradictory, and redundancy)
- TCP, ICMP, and UDP stateful sessions tables
- Defining advanced TCP filtering rules using TCP flags
- Defining advanced ICMP filtering rules
- Defining advanced UDP filtering rules
- View the logs of dropped packets by stateful table

These features are expected to assist considerably in the education process, since they allow students to be more aware with what is happening exactly inside the firewalls.

The objectives of this project are outlined as follows:

- Emphasis the significant importance of adopting educational firewall in universities for studying, designing and setting secure infrastructure networks.
- Provide an educational solution that helps students to be more flexible with all network components, and improve their hands-on security skills.
- Give student a chance to deal with advanced firewalls security features.
- Provide students with experience on how to configure professional firewalls.

Currently, this project is under the designing and implementation phases, and uses Java language as a programming language; specifically, jsp pages using NetbeansIDS software. In addition, MySQL is used to create the project database. Until now, the project allows defining advanced TCP filtering rules using TCP flags, advanced ICMP filtering rules, and advanced UDP filtering rules.





The Smartphone NFC Muter

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ABSTRACT

Entering a library or a meeting room makes people susceptible to embarrassing situations where they may receive phone calls or even SMSs, leading to disturbing all people around. We think that this is a common problem that is worth tackling in a new way. Some software solves this problem by asking the user to provide a predefined schedule for when the smartphone should be muted. Other apps use GPS fencing where the smartphone discerns its location and mutes itself when the user approaches predefined points of interest such as mosques/churches, libraries, classrooms and conference halls where quietness is an essence. Apparently, both solutions require prior user input and constant updates in order to have an effective solution.

In this project, we built an Android [1] app (Fig 2 & 3) for toggling the smartphone between the silent and normal states. Smartphone users can simply tap their handset to a tag (Fig. 1) affixed to the door frame, or to the desk, of the meeting room so that the phone switches itself automatically to the Silent mode, with zero interactions with the internal software of the cellular phone. A confirmation photo (Fig. 2) is displayed to the user in order to ensure that the new profile is in effect. Our solution is based on the new wireless technology, called NFC (Near Field Communication) technology [2] that augments new smartphones such as Samsung, iPhone and Nokia. It is fast and energy-friendly.



Fig 1. Tapping an NFC tag



Fig 2. Our NFC Writer

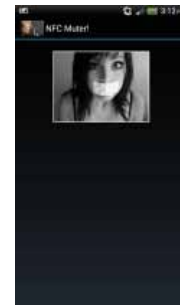


Fig 3. After tapping a muting tag

Upon tapping the tag, the mobile automatically responds to the already written command inside the tag. Depending on the color of the tag, this command instructs the smartphone to switch to either the Silent or the Normal profile. To ease the deployment of our app to the users, we encoded the URL for downloading the app from Google Play [3] inside the tag. Therefore, if the app is not installed on the user's smartphone, upon tapping one of our NFC tags, the smartphone automatically connects to the Internet (Google Play) and downloads our NFC Muter app seamlessly.

Our solution is simple and easy to use such that it does not require training. Furthermore, we foresee its applicability in many domains and useful to assorted users:

- Students at schools need our app in order to mute their phones before entering classrooms.
- Employees in companies need our app in order to mute their devices before engaging into a meeting.
- Prayers need this app in order to avert disturbing other prayers in a mosque or church.
- Even average people at home can use our app to put their phones to the Silent mode when going to sleep.
- Drivers can also take advantage of our app in order to prevent distractions while being on the road.

References

- [1] Google's Android Operating System. (November 15, 2012). [Online]. Available: <http://www.android.com/>.
- [2] C. O. (June 2006). [Online]. "[An Introduction to Near-Field Communication and the Contactless Communication API](http://java.sun.com/developer/technicalArticles/javame/nfc/)". Available: <http://java.sun.com/developer/technicalArticles/javame/nfc/>.
- [3] Google Play. (November 15, 2012). [Online]. Available: <http://play.google.com>



EyeFinger by means of new Technologies and Cloud Computing

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Supervised by:
Habib Fardoun

ABSTRACT

Reading has become one the most fundamental ways of communication and knowledge transfer, among people of different races and ages. However, reading depends mainly on the power of sight, accordingly, for more than a century, the visually impaired have used Braille, which relies on the sense of touch. Although Braille has been highly successful, but it has some limitations: i.e. Braille book availability, cost, and size. Most statistics shows that at least 73% of visually impaired people prefer to read books rather than listening to it as audio. With today's technology at our disposal, better and more effective ways for visually impaired people to read can be developed.

Our application propose a novel device, named 'EyeFinger', that enables the visually impaired to read regular printed books. To read with EyeFinger the user passes a small finger-scanner on the text that he wishes to read. Electronic signals are sent to a device, which will elevate special pins on their finger that takes the form of their corresponding Braille letter. The EyeFinger was tested on visually impaired participants (from Mecca City in Saudi Arabia) and achieved 97% accuracy in recognizing letters and numbers. Recently, cloud technology has become the most innovated platform that delivers IT services (infrastructure, software, data storage and information) in a simplified way to end-users over the Internet so they can get the benefit of compute resources on demand; or in the language of cloud computing "as a service".



The first version of 'EyeFinger' achieved its primary goal, in enabling visually impaired people to read regular printed books. Resolving by this the existent problem of impaired people. However, we identified new limitations, by means of technology use. Thus, we proposed "Cloud EyeFinger" that integrates the EyeFinger with Cloud technology. Cloud computing and Internet services will help EyeFinger system to provide its users more flexibility and autonomy, to perform many of the tasks and actions that nowadays most people do with Internet. The new system (Cloud EyeFinger) saves a softcopy of the book in the cloud, once he has read it using the EyeFinger system. The user can start reading at any time the eBooks that he stored in the cloud, from any location. The visually impaired can also interact with Web 2.0 services and mobile messaging platforms through Cloud EyeFinger; for instance the user will be able to read all tweets of the people he is following, and at the same time write his owns. Using GPS service will indicate them with braille pin, the name of the streets, current location, without making others notice their incapacity.

In conclusion, the objective of this study is to find a new way for the visually impaired to read regular books using cloud technology. A novel model has been designed called "Cloud EyeFinger". It can lead to a viable production system that will give the visually impaired the opportunity to read books and improve their quality of life. Our proposed "Cloud EyeFinger" system, acts as a platform to allow visually impaired people to not only read printed books and interpret pictures, but users can also save soft copies of what they have read, interact, participate in online activities and networks and obtain self-independence.





Quick Response Emergency System

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ABSTRACT

Anyone may get in an emergency situation at any time, and when he arrives at the emergency room in the hospital a common problem appears; that is, he is unconscious. Therefore, doctors cannot know for sure what kind of diseases he has and what medicine he is taking. This can also happen to a child who might have an accident and be admitted to hospital or even to an adult who is conscious but doesn't know the names of the medicines he takes. In some cases the medical staff give the patient kinds of medicines which may contradict with the medicines he is already taking, such a contradiction may cause death or serious complications. Undoubtedly, the most proper solution here is to carry your medical record wherever you go, but this is impractical, uncomfortable and leaves no room for privacy. The solution, then, should be one that is comfortable, practical and preserves your privacy at the same time.

Objective & Motivation

Our project is to provide a solution for this problem by storing patient's encrypted health information in the form of QR code technology. The emergency staff can read the QR code via a small android application which uses the camera of the mobile phone. The code will contain two types of information:

The first part contains a brief description of the patient's most important diseases and medications stored in text-based format to guarantee fast retrieval . This part of survival information will be available intermediately within the code without a need for an internet connection. The second part of information contains further details [Charts ,images, detailed prescriptions] of the patients medical record and can be accessed by the medical staff through an internet connection to an online database stored on a secure website in which pre-registration is required.



Taxi Finder and Tracking System

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ABSTRACT

This project focuses on solving a problem in the communication flow between passengers and drivers by offering a comfortable facility for people when finding a taxi. Taxi Finder and Tracking System (TFT) is a mobile-based application that offers an ambitious idea to facilitate human interaction with the transport infrastructure using the digital world by giving a direct link between the users and the service providers.

In Jordan residents have to walk long distances or wait for long periods of time to find a suitable means of transportation, specially a taxi. In addition to scarcity of taxis, there is also a scarcity of information about the taxi drivers. For example, is this driver ethically committed? Does he have the habit of over-speeding?

On the other hand, drivers often face hard times finding their passengers and currently do not have a method to show their performance to their managers.

In this project, the researchers are going to develop a system that will solve these problems and help people to find a taxi without exerting any extra efforts. Moreover, using this system the drivers will have less idle time and can utilize their time efficiently and increase productivity.

The proposed project facilitates the process of finding a taxi and information about the drivers and sends them to passengers' mobile devices. At the same time, it will allow drivers to optimize work time, find passengers and be evaluated and rated by passengers.

Our project is comprised of several components, such as the registry component that is responsible of saving the full information about drivers and taxis. The data flow control component controls the flow of information between all other components and stores and retrieves information to and from the database. Such information can be sent to parents in case a minor gets into a taxi. In this case parents are aware of the driver, his/her car, time of getting in the taxi, tracking his/her direction and other information, which enhances security for all.

Another component of the proposed project is the users' ability to evaluate, rate and provide feedback about the taxi drivers. This component allows the user to provide feedback about the driver's behavior, commitment and performance. The results of the users' rating and feedback can be later accessed by users and managers. This will help the users to decide to go with this driver or not, which in turn increases the safety for all. Because this information (rating and feedback) can be accessed by the drivers' managers, the drivers will naturally adjust their behavior and commitment in order to conform to the rules and regulations controlling the transportation system. This, as a whole, will increase safety and productivity.



Design and Implementation of a Firewall Tool for Android Devices

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ABSTRACT

Nowadays, smart phones are spreading widely, and are used daily for internet browsing, personal communication and online sharing and purchasing. Android devices are exposed to Internet attacks and are easy target for malicious users. A test that has been conducted shows that denial of services (DoS) attacks have considerable effect on degrading the processor performance of Android devices. The motivation behind this project is to offer a security tool to protect Android devices' users from malicious activities and unwanted network traffic.

For example, there are many FTP applications available for Android devices that allow opening specific ports for sharing a directory. In such a case, a malicious user can use a port scanner program to find open ports on a target Android device. This would expose personal information saved in the Android device. Actually, there are a very limited number of security applications for Android devices that allow filtering Internet traffic; however they are not efficient enough in controlling Internet traffic.

This project intends to develop a firewall tool for Android devices to control incoming and outgoing Internet traffic, and to allow the device's user to block unwanted and unsecure services and protocols. For example, an Android device's user might use FTP to share his files, and allow only limited trusted persons to remotely download the files. The firewall tool allows implementing such a security policy, which is the FTP server, in the Android device, will be accessed only by authorized persons.

The firewall tool will allow the Android device's users to select the protocols whose corresponding traffic will be filtered, including, TCP protocol, UDP protocol and ICMP protocol. In fact, the user can assign a general rule for all connections, or assign specific rules as illustrated in Figure 1. The user can also control incoming and outgoing traffic by defining the appropriate filtering rules.

For example, Figure 2 shows a filtering rule corresponding to an ICMP security policy. The filtering rule allows denying incoming ICMP traffic of type 9 and code 5 to reach the Android device.



Figure 1. Filtering rule definition



Figure 2. ICMP Filtering rule

The firewall tool has the following capabilities:

1. Deny or allow any type of incoming or outgoing traffic.
2. Control the traffic related to ICMP, UDP and TCP protocols.
3. Control common services, mainly FTP, Telnet, SMTP, POP3, and HTTP.



Computer Vision Based Student Behavior Monitoring System

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ABSTRACT

Young students are very active at their early age. The monitoring of their behavior in classrooms is critical for their good education. In most schools, this monitoring is remotely done by humans through a closed loop camera TV system. However, in case of schools with large number of classes, such task is cumbersome. This is because a human cannot keep track of many screens simultaneously. In this project, an automated Computer Vision based student behavior monitoring system is proposed.

The system is based on a medium-to-high resolution camera that takes a video stream, sends it to a server where processing is performed. The processing, on the server side, is performed on a frame-by-frame basis. For implementation purposes, the video data is considered to be a three-dimensional array; the dimensions being width, height, and time.

The implementation approach is based on frame differencing; statistical parameters are then computed from the video stream. These parameters define the level of activity in the video stream and hence in the classroom. The main parameters are variance and entropy of the amount of information in the stream.

Frame differencing focuses on detecting changes between consecutive frames. Each pixel in the frame is represented by a value; a single value in the case of gray level images, and a 3-element vector in the case of color images. A complete frame is stored as a 3-D array in case of a color sequence. The difference between the current and the subsequent frames indicates a change in the video sequence. If the difference exceeds a certain measured threshold, motion is indicated.

Another approach is finding the entropy of the video sequence; it serves as a good measure of activity. Entropy, in information theory, is a measure of uncertainty in a random variable. Probabilities and statistics help us calculate the entropy of individual frames and of complete video sequences, therefore, indicating motion.

Basically, the processing, and hence the monitoring is done on a frame-by-frame basis, which may not be adequate for real-time. But, once the processing is done in the Discrete Cosine Transform domain (DCT) [1] monitoring in real-time becomes possible. In the DCT domain, much less data is to be processed, therefore, faster processing speed.

The Computer Vision based student behavior monitoring system, will be able to produce statistical reports about students and their behavior, it will also notify the school management in case of excessive activities, and inspect the attendance of present students in classrooms. Implementation of this system in schools lessens time consumption in useless activities in classrooms, and observing students' behavior would become a stress-free task for the school management. The capability of the project to adapt to different organizations can open the door to miscellaneous monitoring solutions.

Reference:

[1] Watkinson, J. (2004). *The MPEG handbook: Mpeg-1, Mpeg-2, Mpeg-4*. (2nd ed.). Focal Press.



Online Recruiting Office

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Supervised by:
T. Shagufta Iqbal

ABSTRACT

In these days Internet is one of the most powerful media which can be used for any means of communication. With the explosive growth of Internet, majority of the organizations start increasing their use of the Internet as recruitment tool or hiring process.

Many employers are still depending on expensive methods such as newspapers, classified magazines and physically searching the firms to find the best candidate from the market for their job openings.. It is quite time consuming for the job seekers to search job opening in different companies. Most of candidates have to search from office to office and they have to enquire about available jobs in any organizations personally. Although when a company is in need of any particular employee, all recruiters might not be available 24 hours a day, 7 days a week to accept resumes. Through the traditional media employers might not be able to hire the best candidate against their jobs from the world. It might not also be easy to filter-out the applications that don't meet the recruitment criteria. It is very difficult to search and find a job or worker and if they do so, they may not find the one which matches with their specialties.

To mitigate the problem faced by job seeker and employers in traditional hiring process there is a need to design and develop "Online Recruitment Office" which will be clear and easy to use website. It will help to reduce many of the problems that occurred in the traditional recruitment process, but now with Online recruiting Office website they can search in various categories to find what they need. This web site will serve both the job seeker and the employer by finding what they are searching for at minimal effort and time as possible. This idea is to help everyone who couldn't find a desired job, also to improve their income and to help the organizations to find desired employees. This web site will also provide opportunities by extending the scope of the goals which they are seeking for them. This website attracts the job-seekers as well as employers. The administrator is the mediator between them. There is a normalized database (Microsoft SQL Server) which saves and yields consistent results. The employer is responsible to post the job requirements and set the company location in Google map. The administrator will have a clear view of number of vacancies, number of candidates applied and number of candidates selected.

The website has the ability to email the users of the latest jobs or workers that matches what they looking for. Also, it uses the most popular social websites to share information about the important job vacancies. Also, the website provides an interview room for those who can't travel all over the word for a job meeting and to make the recruiting process easier. The application that is used in the website for interview is ooVoo. With ooVoo, they can Web Call anyone using their personal web call link. Also, the website provides a feedback for those who applied for job. The users will be informed if the job still available or not to stop waiting and to start searching for another one. Also, the website will notify the user if there is a message from an important job to avoid losing any opportunity. Also, the website has a section for events which enables people to easily search for relevant events and print their event ticket.





Image-Based Rovio™ Robot Localization Algorithm

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Supervised by:
Dr. Anas Fattouh

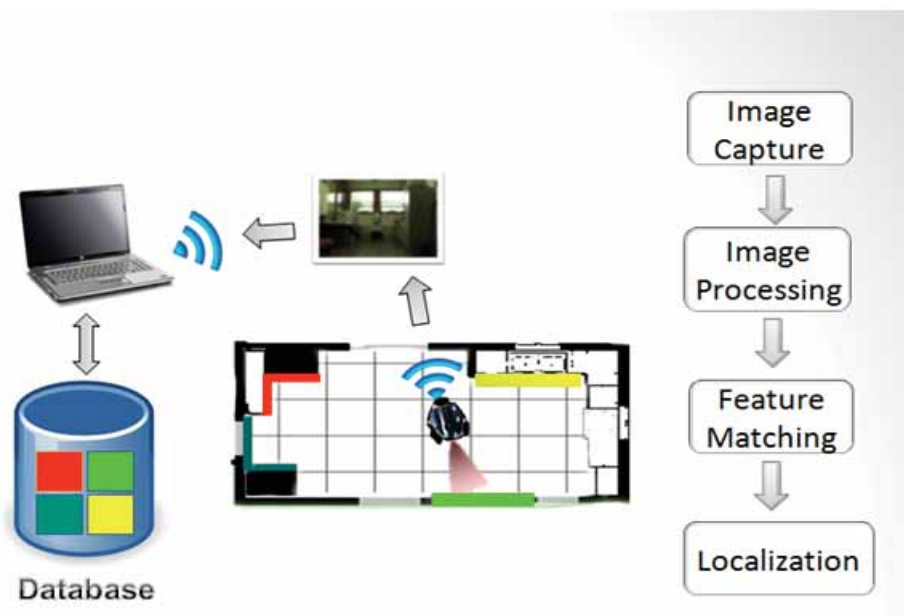
ABSTRACT

Vision is one of the most important sense that human has as a gift from the Creator (Allah). With vision, we can recognize, understand our surroundings and locate our position. Today's problem is how the robot can determine its position and direction in a known given map. In this paper, we give the Rovio™ Mobile Robot the ability to estimate its position and direction within its environment.

The project presents a system for indoor localization and furthermore to apply the system for outdoor global localization using the vision of a monocular camera. Based on images captured from Rovio™ and known features of a given environment stored in a database, the robot's position and direction are estimated. The features are extracted from the images captured by the Rovio™ camera and matched with those features stored in the database.

Practically, The map will be represented by using sequence of images stored in database as cell array ,each cell contains a set of information such as (position , direction and images referenced to that cell) ,The robot will start taking the first image and sends it to the computer by the wireless technology for processing to get the SIFT features of the scene, and then it will be matched with the entire sequence of images (database) to estimate the robot's position, when the robot moves to the next cell or position and captures a new image then gets the SIFT features about the next location, the PC will estimate the new position of the robot and updates the robot's position.

Image-based localization algorithm has been proposed and implemented in a PC using Matlab® software. Finally, The project method of localization will be recursively applied until the robot will have a precise position and direction that will be displayed on a map.





High Accuracy and Low cost Febrile Seizure Detect and Alarm System

Khader Mohammad, Sundous Hussain and Rawan Rimawi

ABSTRACT

Wearable medical technology is becoming increasingly popular. Such devices have the potential to vastly improve the effectiveness, safety and economy of monitoring vital signs including: Blood pressure, heart rate and body temperature by both patients and clinicians.

Available systems provide no remote monitoring mechanism. We intend to provide a low power reliable, non-intrusive and noninvasive body temperature monitor that processes and analyses data acquired from sensors designated to monitor body temperature and limbs movements.

The objective of this project “Febrile Seizure Detect and Alarm System” is to design and implement a reliable, low cost and non-intrusive system that is to monitor a child’s body temperature using high precision temperature sensor and alarm his/her parents or guardian on their mobile phones as well as on a webpage which can be accessed via internet connection so as to avoid convulsions brought on by a significant rise in body temperature. The theory, design procedures and discussions are presented in this research. High accuracy rate of $\pm 1\%$ $^{\circ}\text{C}$ is achieved with cost of 185\$.

The sensors will be interfaced to communicate with a mobile application that is installed on the child’s guardian mobile and with a webpage so as to provide remote monitoring as well as issuing an alarm of febrile seizure occurrence.

Body temperature can be measured from different locations of the body. We intend to measure temperature using a device that can be worn as a watch which is arguably more comfortable than other locations (mouth, ear and rectum). Measuring body temperature can be very challenging as it depends on factors including: level of activity, time of the day as well as psychological factors.





Language Development for Hearing Impaired Children

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ABSTRACT

Hearing impairment is a challenging problem that affects many members in the society. Hearing loss is having insensitivity to sound in speech frequencies. Therefore, it hinders people who have it in areas of learning and language acquisition. Furthermore, language is the tool to express needs and to communicate with others. In this paper we propose an efficient way to develop a learning environment for hearing impaired children in order to help them better learn basic skills in Arabic language under a mobile computing platform. Also In this work, we have used the Android operating system by Eclipse plugging Android developer tool.

In this work we have built an application to help hearing-impaired children to learn Arabic in a fun and an attractive and easy way that starts from the beginning and helps them to express their needs and develop their communication skills.

The motivation of the project is to design and built an application to help hearing impaired children to learn the basics of language. Kids, who suffer from prelingual deafness, hearing impairment before the acquisition of language, delay in learning from their peers of children who do not suffer from hearing loss. Also, they have a smaller opportunity to develop their skills. This application can be used by those children without them getting bored because current time kids love smart devices, But the big challenge in building the application is to find an attractive way to display information to a special category..

The project has the following objectives:

- Develop a curriculum for hearing impaired children using a Mobile computing platform. In our case, we have used the Android developer tool.
- Develop a learning environment that should be fun, easy, and entice learning by hearing impaired children.
- Develop a special application to learn language for hearing impaired children such as number, color and letter.
- Develop application in Arabic interface.
- Representation of information in sign language.

The application has many stages to teach children the basic language skills. Also in the application stages, children will learn the Arabic numbers, letters and colors (through the presentation of information several times accompanied by clear voice to utter and display sign language) and the children should succeed examinations short order can supplement learning On the other hand, after exceeding a certain stage of the educational program, children has the option to play games, which will become available for them to be confirmed information.



Path Planning Algorithms for RovioTM Robot

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ABSTRACT

Robotics world attract the attention of researchers around the world, where robot works according to an intelligent algorithm that designed by programmers., and it uses in various fields: medicine, engineering and communications ..etc. our project talk about improving and implementing path planning algorithm and avoiding obstacles spicily moving obstacles in a robotics . There are many algorithms for solving path planning problems and avoiding obstacles in dynamic environment. here we select A* algorithm to improve and implement the improvement in real time .

The Initial Design

we will explain initial design step-by-step:

step 1: Set position and direction of the rovio robot.

step 2: Set target that we want to reach .

step 3: Set and detect nearest obstacles to avoid it. and we mean by "set" is some of static obstacles are in the memory of the robot. when we run algorithm for first time the memory of obstacles is empty.

step 4: Build map start from current position to target and taking direction and obstacles in account.

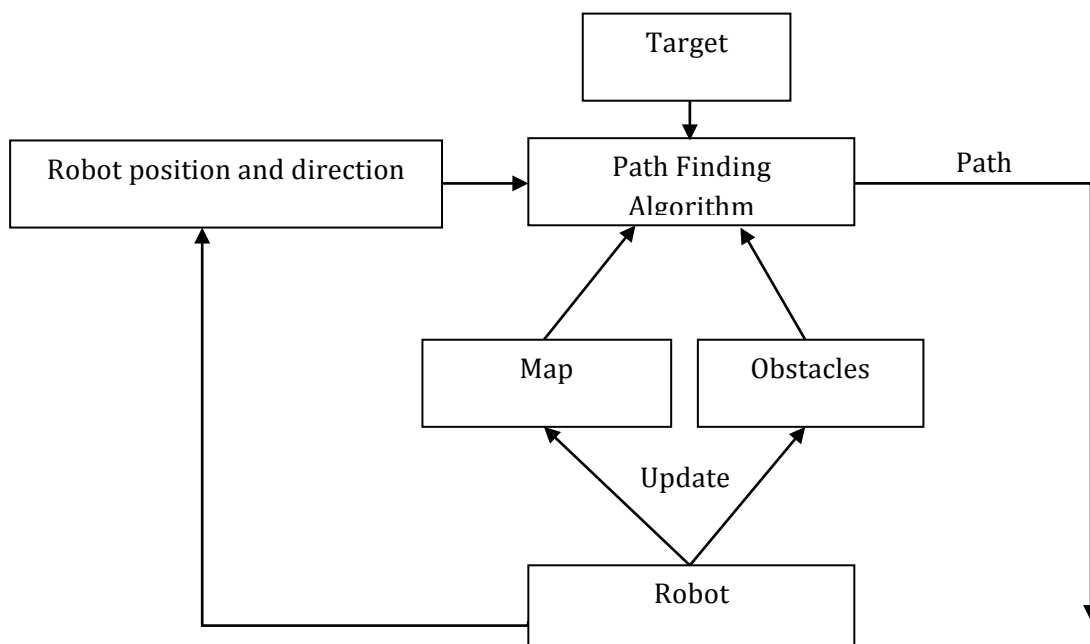
step 5: Send optimal path to the robot after processing information we get from previous steps.

step 6: Move according to received path until detect new obstacles.

step 7: Update obstacles, map, position and direction.

step 8: If we reach target stop. else go to step 5

After some of iteration our algorithm become intelligent.





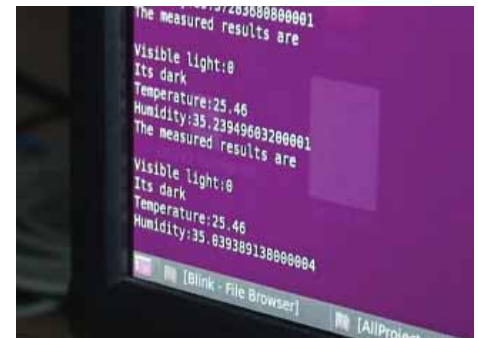
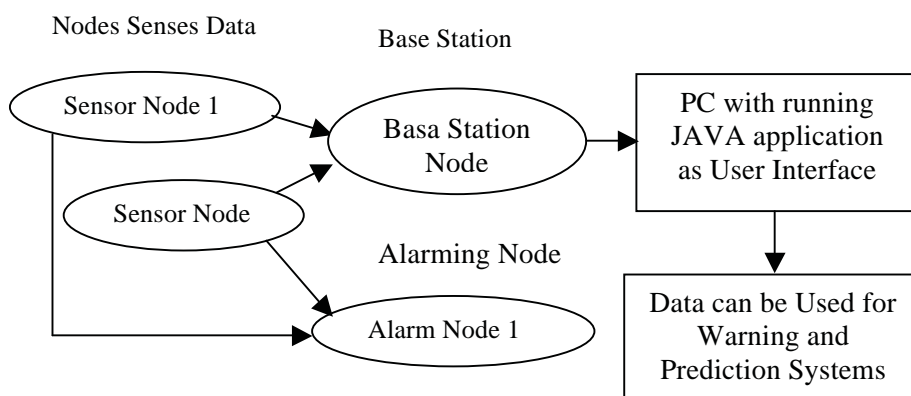
An Alarming System for Botanic Environment Monitoring

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ABSTRACT

The developed application is for monitoring in a botanic environment which can be used over the web too. It can play an important role in monitoring environment for photo sensitive plants. For example, if photosynthesis is decreased due to low light conditions and high humidity (which closes stomata and reduces gas exchange), then the production of sugars will decline and the fruit quality, shelf life, and size will all diminish. In such a situation monitoring the overall conditions for maintaining an optimal environment for better functionality becomes a necessity. In this work we used IRIS sensor nodes which are sensing and sharing data in order to capture environmental conditions for better and easier monitoring.



In our project work, we set up sensor nodes that senses and sends environmental conditions like temperature, humidity, light intensity in certain intervals to the base station. From the base station data are transmitted to the PC and listened by JAVA based application for further use, including on web. There can be one or more sensor nodes to determine the environmental conditions all at once or separately. At the end, the application outputs the actual temperature, humidity and visible light captured values. Furthermore, if the environmental conditions fall below an optimal value, the condition (for example, if the light intensity in the surrounding falls below a threshold value) will be prompted on the screen. In addition, other sensor nodes give an alarm to notify the surrounding of the condition so that instant measures can be taken. Different threshold values can be set for monitoring different conditions, as needed.

The application and set up can be modified and integrated with other components to construct different variety of applications. Multiple conditions can be simultaneously joined and grouped together according to requirements for a collective and better monitoring. As a result, a lot of opportunities are there to extend such monitoring systems to a robust predicting and warning systems. Further, user role based notification and access policies can be controlled and implemented. Further, thresholds can be established using the Internet, on an on the go basis. It should be noted, that due to resource constraint in wireless sensor nodes, care is to be taken to ensure correct timing of nodes to sense, so as to make the application energy efficient. Further, communication between sensing and alarming nodes can be made more energy efficient and secure to avoid tampering and hence, wrong notifications and loss.



“Be Safe” system

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ABSTRACT

With all the hassle and stress in dealing with many devices and equipment inside buildings and houses, accidents and incidents may happen which may lead to serious injury or death and people may not know how to deal with them. These accidents/incidents summarized as followed: In the case of fire, a major problem is that rescue teams will have no idea about the number of people and their locations. The number of injured victims may have exceeded the number of the rescue team. Eventually, they will ask for support and will wait till they arrive. This will cost time and maybe lives and in some cases. Additionally, if the numbers of the rescue team are enough to rescue all the people, they will waste time to find them and this may lead to more loses. In case of gas leakage from cooking equipment in the kitchen people in the house may not know how to react properly to leakage situation, and it may be too late to call for help or escape from this situation. The gas may spread and suffocate every one or may lead to a big fire. In case of dusty weather and the windows are open, it may put in danger the health and well-being of people in the house. In this case, it may lead to respiratory problems and if kids who are sensitive more from dust are alone in the house no one can handle this situation and close windows.

“Be safe” system is a smart house system that will interact with the previous accidents to ensure a safety environment for people. In order to keep people in a safe place and protect them during an emergency, the system offers several intelligent features that fit all types or sizes of buildings.

- In case of fire “Be safe” system will help to reduce the fire accidents by using the fastest way to detect fire. Also “Be Safe” system will identify the number and location of people inside the house or building and this will be shown in the system’s interface (using smoke sensor and IR-Reflected sensor).
- “Be Safe” system is equipped with sensors that are used to detect gas leakage. In the case of gas leakage, the door of the kitchen will be shut and the windows will be opened.
- “Be Safe” system has a dust sensor placed outside the building to detect dust. When the weather is dusty, especially in Kuwait that is usually affected by dusty weather, the windows will be closed to prevent the dust from entering the house and the closing operation of the windows will be motorized.

The following diagram (Figure 1) explains the system’s architecture.

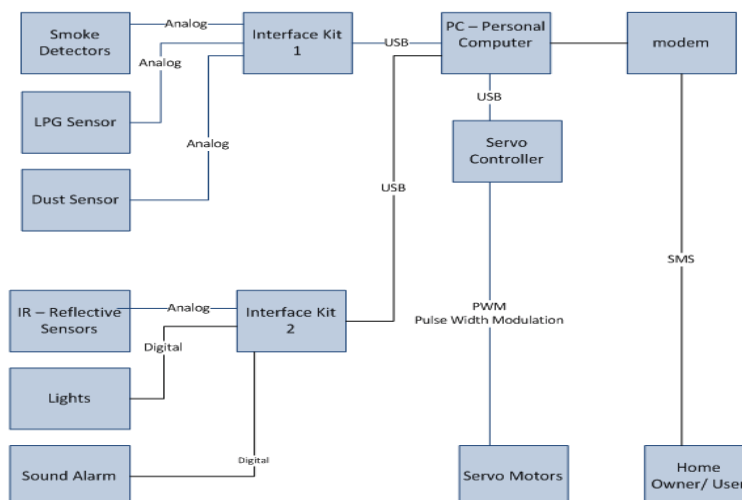


Figure 1 "Be Safe" architecture



Mobile Education Student Tracker

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Supervised by:
Dr. Riyadh Makki

ABSTRACT

According to the importance of education in the lives of our children and coping with the development of science and technology in education, we must develop a new mechanism to track our children in the places of education and to inform constantly about their grade and moral levels. Because the parents need to watch their children closely and to communicate quickly and effectively with the educational environment of the child, and because of the adolescence impact of teen students, We chose the intermediate stage - the boys section to tracking.

Numerous interviews were made and large numbers of questionnaires were distributed to the students, parents, and the everyone who cares in the learning environment (professors, student affairs) and we were able to have a direct access to the tracking progress and the current possibilities of it. After the continuous research and the access to the technological information and the possibility of electronic tracking in smart devices. Figure1 depicts steps to building an android app and website with using web services.

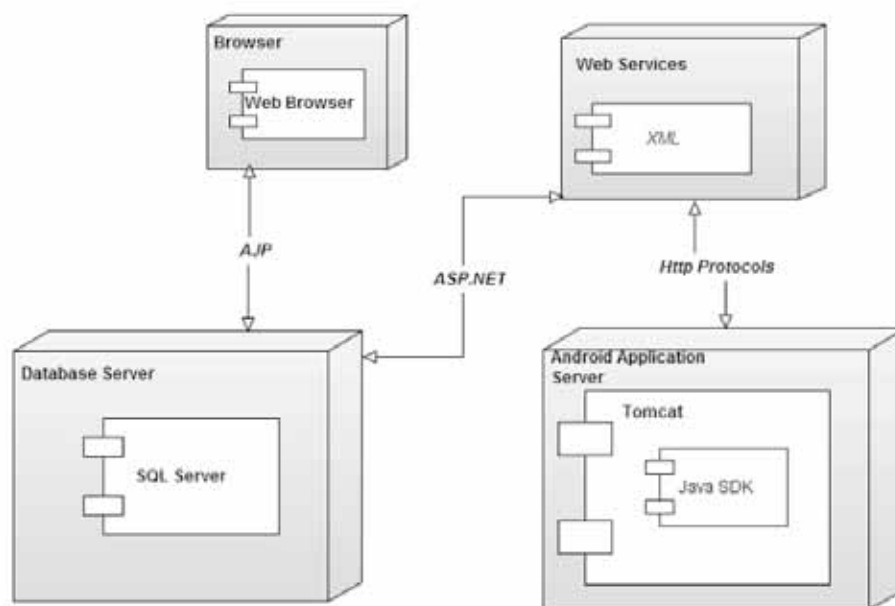


Figure 1: Deployment Diagram for Android app.

We conclude that we must enable the parents to track their child scientific and moral levels constantly by creating an application on smart devices, based on the Android System in an effort to provide comfort to the parents and to enable them to communicate with the educational environment that their children belong to.

We have been working on this project in accordance with the requirements of Al-majd Private Schools in order to achieve their goals in the quality of education.



Comparative Study of Hybrid Routing Protocols in Wireless Sensor Networks

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Supervised by:
Shaik Mastan Vali

ABSTRACT

Wireless Sensor Network (WSN) consists of tiny sensor nodes with sensing, computation and wireless communication capabilities. Now a day, it is finding wide applicability and increasing deployment. The performance of WSN is mainly decided by how well the routing protocols are designed. The design of routing protocols for WSN is influenced by many challenging factors specifically network topology. The brief reviews of the existing routing protocols are presented. This paper is an attempt to focus on the routing issues and various routing protocols to achieve the goal. The paper further presents the analysis of different hybrid routing protocols in WSN.

Wireless Sensor Networks can be divided into three categories according to its network structure, flat routing protocol, hierarchical routing protocol, and geographical routing protocol. Proactive routing, Reactive routing, Flow oriented routing, Hybrid routing and Hierarchical routing etc., are some ad hoc network routing protocols.

Hybrid protocols combine the advantages of proactive and of reactive routing. The routing is initially established with some proactively prospected routes and then serves the demand from additionally activated nodes through reactive flooding. The choice for one or the other method requires predetermination for typical cases. Hybrid Routing, commonly referred to as balanced-hybrid routing, is a combination of *distance-vector routing*, which works by sharing its knowledge of the entire network with its neighbors and *link-state routing* which works by having the routers tell every router on the network about its closest neighbors. Popularly known Hybrid routing protocols are Core Extraction Distributed Ad Hoc Routing Protocol (CEDAR), Zone Routing Protocol (ZRP) and Zone Based Hierarchical Link State Routing Protocol (ZHLS).

In this paper we emphasize more on Hybrid routing protocols. CEDAR integrates routing and QoS. It is based on core nodes, which together form the dominating set (DS) of a graph. A DS graph is a set of nodes where every node is either present in DS or is a neighbor of some node in the DS. There will be at least one core node within three hops. The drawback of CEDAR protocol is that the movement of the core nodes affects the performance of the protocol as the route computation is carried out at core nodes only. Also the core node update information could cause the significance amount of control overhead. We propose a solution to the above problem is that the information of each core node should be duplicated in a normal node that is associated with that core node. When the core node moves the duplicated node can become the core node of that group. This problem can also be minimized by ZRP where the nodes are divided into zones and the mobility of any core node doesn't affect much.

ZRP is a hybrid routing protocol which has the combination of both proactive and reactive routing protocols. It uses a proactive routing scheme within a limited zone, and uses a reactive routing scheme beyond the zone. An intra-zone routing protocol (IARP) is used in the zone where a particular node employs proactive routing, similarly beyond the zone is called inter zone routing protocol (IERP). The routing zone of a given node is a subset of the network, within which all nodes are reachable within less than or equal to zone radius hops. Each node maintains information about routes all nodes within its routing zone. The drawback of ZRP is that, in the absence of query control, ZRP produce higher control overhead. This can happen due to large overlapping of nodes routing zones. The query control must ensure that duplicate routing requests are not forwarded. Also the zone radius affects the performance of protocol Control overhead can be reduced by reducing the zone radius. Control overhead becomes high due to large overlapping of routing zones. By using the shortest path algorithm, best path from source to destination node can be selected when there are multiple paths found.

ZHLS is a hybrid hierarchical routing protocol which uses geographical routing information of nodes to form non overlapping zones. A hierarchical addressing consists of a zone ID and a node ID. The topology information inside a zone is maintained at every node, and for region outside the zone only the zone connectivity information is maintained. ZHLS maintains high level hierarchy for inter zone routing. ZHLS also employs a proactive approach inside geographical zone and reactive approach outside the zone. Destination node's location is identified by the zone ID of the zone in which it is present. The area of the zone is determined by several factors such as the coverage of a single node, application scenario, and mobility of nodes and size of network. This protocol is more affective in case of mobility. Because of its hierarchical approach, it significantly reduces the storage requirement and communication overhead created because of mobility.

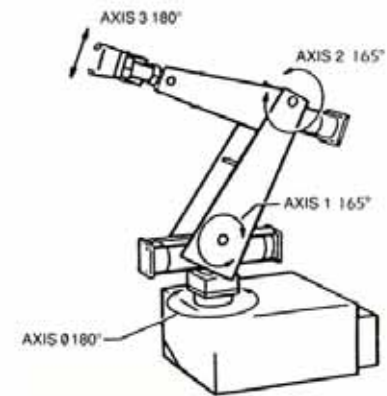


Intelligent Arm System

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ABSTRACT

Intelligent arms or Robotic arms, has been widely used in manufacturing industry as part of automation system. Typical applications of robots in industry include welding, painting, assembly pick and place, packaging and palletizing, product inspection, and testing. Personal Computer or Laptop based robotic arm has the same mechanism as the robots in industry. The pc based robotic arm is fully controlled by a computer, where the user has to control the movement of robot using the four servo motor controller software connected through USB port. The serial servo controller circuit is serially connected to the pc, thus provide communication between the pc and the circuit. The signals produced by the VB.NET program from the computer will be received by the USB controller at the circuit. The justified signal will then be used to execute the output to the servo motor, thus provide the necessary movement of the robotic arm. This project is to fabricate the robotic arm that can be directly controlled by computer. The special attributes of the project is the robotic arm is pc based. Its mean that the robot is fully controlled by the computer, makes it different than typical automatic and manual control robot.



System design of the Robotic Arm

Our project is divided into two parts; the first is to build a robotic arm to pick up an object and place it in another position under the three different modes of operations using C++ program. The second part of our project is to create an Intelligent Arm System through the VB.NET program using Microsoft Visual Studio 2010. The project is very useful in gaining new experience and knowledge on robot arm fabrication and programming.

As the technology is in a continuous change we keep on searching to have better means to serve and benefit the individuals and communities. Nowadays in this fast growing industrial age every company needs speed in manufacturing to cope up with the customer's requirements. Every industrialist cannot afford to transform his unit from manual to semi-automatic or fully automatic. In this scenario, we have accomplished our project, with the title of Intelligent Arm System. Our project is divided into two parts; the first is to build a robotic arm to pick up an object and place it in another position using the C++ program. The second part of our project is to create an Intelligent Arm System that is a VB.NET project using Microsoft Visual Studio 2010. The main components of the arm are; 4 servo motors, frames to hold the entire robot, an adapter and a USB board to link the robot to the computer. While the Intelligent Arm System is composed of different frames which are; login database for the system, Applications of Robotic Arm, Advantages and Disadvantages and Simulation of Robotic Arm. The Applications of Robotic Arm is then consisted of Applications in different fields; medical, industry, space, helping people, art of sketching and games.



Fuzzy based Multicriteria Recommender System for Online Learning

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Supervised by:
E. Anupriya

ABSTRACT

A student who starts learning a course may look for information in the Google search engine. Google returns n number of pages which are related to online learning, online tutorials on the particular course. The student at this state is put to confusion about which website to select for effective learning. It is more humane to get confused in selecting a good website because sites may differ in many factors like well organized (user friendly), easily readable, appear pleasantly, rich in content and rich in related links. To address this uncertain situation in selecting a website for online learning, we propose a fuzzy based multi criteria recommender system which would suggest student community with the recommended list of websites ranked on different criteria. Recommender systems adopt different approaches like content based, collaborative filtering based or hybrid of the two approaches. We have chosen hybrid approach which captures users past preferences, users with similar preferences and fuzzy machine learning technique to model the recommendations.

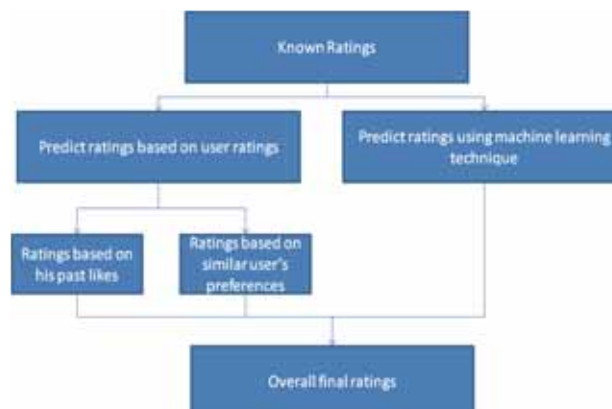


Figure 1: Fuzzy based Multicriteria Recommender System for online learning (FMRS)

A. Users Past Preferences: The customization of user experience is the key in personalization of website recommendation. In reality, millions of users dwell over internet. Therefore, it is practically infeasible to accommodate each users past preferences. Instead many search engines have introduced user driven search engines. In our work, we have modeled a component in FMRS, to collect user preferences manually from approximately 5,000 users for research purpose.

B. Collaborative filtering: The basic notion behind collaborative filtering is find subgroups or clusters of users with the similar preferences. Cosine based similarity and correlation based similarity metrics are more popularly used techniques. Collaborative filtering mechanism takes two approaches: *a. weighted sum approach* *b. weighted average approach*. In our work, we have used weighted average approach and cosine similarity metric to capture similar user preferences.

C. Fuzzy Predictive modeling: Predictive modeling predicts probability of a user falling under a group of users with similar preferences of websites. *Fuzzy logic* is a multi-valued logic which facilitates defining intermediate values between conventional crisp values like true/false, yes/no etc. Fuzzy system includes set membership and logic. Set membership function is a graphical representation of degree or magnitude of participation of each object in the set and it is expressed by a numerical value between 0 and 1. The membership function of a fuzzy set A is defined as μ_A and the membership value of x is denoted as $\mu_A(x)$. A linguistic variable holds a qualitative value using linguistic term or a quantitative value using a corresponding membership function. A fuzzy set A in X is characterized by its membership function, which is defined as $\mu_A(x) : x \in X \rightarrow [0, 1]$, where X is a domain space. Contextually the fuzzy membership function $\mu_A(x)$ can have different interpretations. As an illustration, the membership value of a website x in the fuzzy set of user preference can be computed by the user's degree of preference of that website.

The overall rating is computed according to figure1 to get the list of recommended sites. This system finds its application in colleges, universities and any online learning environment for student community to get best websites for online learning.



An Educational Cryptography Video Game

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ABSTRACT

Problem and Motivation:-

Video games provide a safe and entertaining environment to simulate real world scenarios while teaching and reinforcing video game concepts. At Zayed University, we are creating several modules to teach video games through security. This abstract will focus on the module that I am directly responsible for: Cryptography. Cryptography has existed for thousands of years, and even determined the outcome of major wars and it is a major component of security.

Background and Related Literature:-

We researched and discussed many video games that teach security. My advisors also encouraged me to register for the intercollegiate cyber security championship held at Zayed University to gain more knowledge in security and I was a member of the winning team.

Most video games that we researched lack a friendly user-interface and focus on hacking instead of ethics. Cisco video game was focused exclusively on a specific product as one might expect. I also looked at a few prototypes that had been developed at Zayed. Each of these video games provided insights.

I also downloaded cryptography programs such as PGP and animations to teach cryptography like AES.

Methodology:-

Our project's first three phases included studying existing literature of video games related to security, study existing tools to create video games and defining the content of our game. Even though the whole team did the first three phases together, each of us were delegated specific software to present at the meeting. I was in charge of talking about cryptography and looking for crypto games. There were a few games such as "The Unbreakable Cypto" [11]. Meanwhile, our system is more focus on giving students specific scenarios where they have to make the decision if they will apply cryptography or not, what type of cryptography they will apply (Public Key, Private Key, e.g.), what type of algorithm will they used and other issues at both installation and when specific events occur.

To obtain the scenarios, I also interviewed security administrators and participants of security competitions list of events-actions. Information was collected from previous security competitions and review recently released security related video

Games. Examples of Events-actions are:

Event: Employee Fired

Possible Wrong Actions: Do nothing, Drop User Account

Correct Action: Disable User account

After designing these steps, I started building a prototype and I will be testing the prototype with students. The prototype is being done in game maker and the second version will be done in Unity.

With Unity, we can deploy the software to mobile devices. Flash was also considered in our study, but Adobe has discontinued Flash's development for mobile devices.

Results:-

We completed a few scenarios of applying cryptography to different events as well as when not to apply it. As we add more scenarios, these prototypes will be very useful for undergraduate and graduate students to learn and apply security. It will benefit students participating in security competition.

References:



GIS Web-Based Reporting System Solution for Dubai Municipality: Environmental Site Assessment and Restoration of Contaminated Site (Prototype)

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Supervised by:
Dr. Zakaria Maamar & Dr. Mario Guimaraes

ABSTRACT

Background information

Dubai Municipality has initiated an eco-friendly project that targets the contaminated site on Dubai for the sake of restoration it. Indeed, the importance of such environmentally-friendly project emerges from the serious consequences of promiscuous disposal of wastes as it leads to contaminating of water, air, and lands. Furthermore, the negative impact of unrestrained disposal of wastes on the environment is increasingly dangerous if the wastes disposed contain hazardous chemical, toxic metal, hydrocarbon, or persistent substance. Accordingly, such harmful effects of pollution extend its influences to reach the substrata soil and groundwater which leads to hinder the process of clean-up and restoration of contaminated site. Henceforth, the need of such eco-friendly project is highly required in order to maintain the sustainability and provide a better future to the upcoming generations.

Project Schema

The project schema adopted by Environmental Planning and Studies Section (EPSS) Environment Department of Dubai Municipality is including three main phases in order to approach the final report of environmental site assessment. The first phase includes the initial investigating of targeted site by reviewing records that illustrate the environmental conditions of the site, site reconnaissance that demands the actual visit to the problematic site, interviewing with the present and past owners, operators, and occupants of the property, and with local government officials, and lastly conducting a report involving the three mentioned components. Accordingly, if first phase investigation was positive, means if the investigated site is polluted, the second and third phases must be proceeded. The second phase includes an intrusive investigation where collection of original samples of soil, groundwater, gaseous release or building materials will be gathered in order to analyze the quantitative values of different pollutants. The third phase should be carried on if the investigated site required remediation based on the second phase's recommendations. After all, a detailed documentation of repairing process and validation testing report including all comprehensive elements of the restored site must be conducted.

Solution Workflow

Depending on the mentioned phases of this project, the GIS-based reporting system solution will be developed for Environmental Planning and Studies Section (EPSS) Environment Department of Dubai Municipality in order to easily master and retrieve the data generated from the environmental site assessment depending on browser -based solution with an effective capability of accessing the application from the mobile through ArcGIS app available for iOS, Andriod, and Windows phone so it can be easily used on-site. The solution will be developed using configurable tool developed by ESRI which is ArcGIS Explorer Online that relies on Microsoft Silverlight plugin. The solution provides the capability of being used both in-office and on-site with real-time updates whereas the data gathered on-site doesn't need to be re-stored when the investigator gets back to office. In addition, the investigator will be provided by GPS service so he\she can immediately start adding the collected data (photos/videos/documents/findings) on its exact location on pop-up window as it can be easily updated and edited. Moreover, depending on the attributes and features added to the map, summary, spatial, and statistical analysis will be automatically generated to satisfy EPSS needs. Indeed, the solution will provide the capabilities of sharing the maps, emailing it, embedding it in the web, and printing it. Furthermore, the solution will also help the employee to make a presentation, if needed, using interactive slideshow without the need of using another software.

Business Usefulness

The solution aims to streamline the business process and speed up the decision-making process by providing real-time updates live from the site to the office. Such practice will definitely minimize the amount of time consumed of recording data manually then transfer it besides having a tool that performs multiple tasks simultaneously. In fact, the fast the polluted site is discovered the fast it's restored and a better environment we will have. Moreover, this project considers eco-friendly as it will reduce the amount of papers used to record observations. Indeed, the solution was developed to be used by any employee so it saves the organization the costs of hiring GIS professionals.



Game Engine Comparison

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ABSTRACT

Problem and Motivation:

Comparing products is a very important task that everyone does multiple times in their lives. If you work in industry, you are required to do a more formal or structured comparison. However, many people also do comparison for their own personal use. Video Game Development skills are extremely important for many different type of applications: desktops, mobile devices, web and cloud. Video game development skills can be used into fun game, serious games, simulations and entertainment. Therefore, many different type of game engine and more generic animation tools have been developed. Finding out which development environment suits you best can be an overwhelming task.

Background and Related Literature:

As in any research, the first task was to find out what others have done. In this research, it consisted of reading comparisons between game engines. Although all these comparisons were interesting, none of them fitted exactly what we needed. An overview of Game Engines can be found at [1]. Although many professors, claim that Wikipedia is not reliable, recent research has indicated that Wikipedia may be more reliable than traditional sources such as Britanica Encyclopedia [2]. Interesting comparisons can be found at [3-6].

Methodology

After an extensive review, my next task was to define the matrix. My columns consisted of the Products being compared and my rows consisted of the criteria to be compared. To do a thorough comparison it was important to actually use the product. Therefore, I needed to narrow them down. Based on existing literature [6], visiting university web-sites and my own personal experiences from attending GDC, PAX East and Netgames, I decided to limit the comparison to *Game maker*, *Flash*, *HTML5* and *Unity*. As for the criteria I included Language/API, 3-D Rendering Features, Physics, Prices, and Ease of Use. The last decision was to decide the examples (data set) to be used for comparison. I decided to obtain tutorials done in one engine and try to perform them in with the other tools.

Results and Contribution

For ease of use, Game Maker was easily the winner. It appears to be the best tool in the market for creating quick prototypes and can be very efficient for creating 2-D games. For price, HTML5 was the winner (free) while Game Maker and Unity were a close second. Both offer a basic engine that is free and an extended engine that is paid for. Flash only offers a free trial version, so it was the worst with regard to price. For Language/API, Unity offered the possibility of using Javascript or C#. Meanwhile, Game Maker required to use its proprietary scripting language. As for 3-D Rendering Features and Physics, Game Maker provided the best results. I believe that the steps followed in this research can provide a framework for comparing other software tools.

References

- [1] Wikipedia, *Game Engine*, Retrieved from http://en.wikipedia.org/wiki/Game_engine on February 1, 2013.
- [2] Ionescu, D. *Has Wikipedia Beaten Britannica in the Encyclopedia Battle?* Retrieved from http://www.pcworld.com/article/251796/has_wikipedia_beat_britannica_in_the_encyclopedia_battle_.html on February 1, 2013.
- [3] Eseenthel, *Game Engines Comparison*, Retrieved from <http://www.esenthel.com/?id=compare> on February 2, 2013.
- [4] Johns, Dan, *TECH SENSE: Flash vs. HTML5: The Facts and The Hype*, <http://remysharp.com/2010/02/08/html5-vs-flash/> on February 3, 2013.
- [5] Wikipedia, *Comparison of HTML5 and Flash*, Retrieved from http://en.wikipedia.org/wiki/Comparison_of_HTML5_and_Flash on February 3, 2013.
- [6] Guimaraes, M, Said, H. and Austin, R., *Experience with Video Games for Security*, Journal of Computing Sciences in Colleges, January 2012, Volume 27 Issue 3, pages 95-104



The security of Internet Browsers

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ABSTRACT

Problem and motivation:

Different browsers have different types of security and different levels of security. Each browser has something better than the other when it comes to security however comes the problem of what browser to use exactly. This is a problem faced by many and many users of the internet nowadays and choosing the “right” internet browser seems to be hard. Of course with different kinds of testing and analyzing this can have a solution and an answer to what “best” browser can be used will be provided. The reason is that everyone wants to have the best security when surfing the web or downloading anything or even when pop-ups come up on the browser, some do better in blocking them and some not. In this research paper we will be comparing Google Chrome, Mozilla Firefox and Internet Explorer as these are the most popular internet browsers that are used around the world on computers. We will be doing penetration testing on all of these three internet browsers including using the different modes each browser offers (safe mode, no add-ons mode and so on). The goal of this research paper is to try and convince as much people who are either doing researches or even curious to know about which internet browser has the most security is to show them which one has the most security and by doing so we have proof to state why we think this is the best internet browser in terms of security.

Background and related work:

Related work and a bit of a background to enlighten this up and give an idea of what this research is about is what Henry, A. (2011) stated on a blog post on www.lifehacker.com. He basically tested different browsers and analyzed which browser is best in terms of its security. This research will be also sort of the same and what Henry has written is a motivation in to know what is the best internet browser to use and what could possibly be the reasons to it or proof that it is the best browser. Henry has also done some of the best ways of testing them out in order to see which internet browser could possibly be the best out of them all and that includes him using the different modes of the browser in order to achieve results and analyze based on what he have seen in different modes on the different browsers he has analyzed and experimented with. We will be doing nearly the same thing except the penetration testing that we will be doing is going to cover all the different modes plus different kinds of penetration tests will be done such as going into a known website with malware and pop-ups and see which browser is able to attract more pop-ups and malware faster and in a less secure way.

Approach and uniqueness:

A research paper is considered one when it has a uniqueness component in it otherwise it's just probably a white paper. In this research paper it would be novel because as mentioned before that Henry has talked about the different browsers and used different methods of testing these browsers and their capabilities of making the user feel secure. For this, penetration testing will be used on different modes of windows and different modes of the browser itself (safe mode mostly) in order to see the difference in blocking attacks with or without add-ons for example. There can also be a difference even when just browsing the internet with the normal internet browser with the full add-ons and other features and see the difference between them. Different methods will also be used to test but these will be typical (same as the one in Henry's blog post) but penetration testing using different modes of windows and the internet browsers is the main unique idea about this research paper.

Results and contributions:

This research paper will hopefully make more people aware of what browser to use best for their desire and needs. Some are eager to know about this for their own sake or for research or even for fun and some would want to know this mainly because they are in the same field of interest and would find this research paper hopefully interesting to read and see what methods have been used in order to know the best secure browser out there for everyone. Some might even be interested in the penetration testing part and see how it is done to for example, the browsers. The significance of these results will also help people in the same field of studies in terms of research and other findings of their own during their studies and maybe enhance this idea into something of their own unique idea and also call it a “research paper”.

References:

Henry, A. (December 13, 2011). What's the Most Secure Web Browser?. In *lifehacker*. Retrieved February 24, 2013, from <http://lifehacker.com/5867545/whats-the-most-secure-web-browser>



MANET Routing Protocols

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ABSTRACT

A network made up of routing nodes that are mobile, use wireless communication and happen to be near each other is called an ad-hoc network or MANET (Mobile Ad Hoc Network). Examples of such networks are military vehicles on a battlefield with no existing infrastructure, a fleet of ships at sea and emergency workers at a natural disaster site where infrastructure has been destroyed.

MANETs are quite different from traditional fixed routing infrastructures in that rules about fixed and known neighbors, fixed relationships between IP addresses and location are not significant any more. In MANET, the topology may be changing all the time, so desirability and even validity of paths can change spontaneously, without warning. In a nutshell, the routing principles in MANETs are quite different from routing in fixed networks.

MANETs have become very popular in military combat radio networks as well as sensor networks. Traditional fixed infrastructure routing protocols tend to be proactive whereby the protocols always try to maintain reachability within a routing domain regardless of whether a route to a particular destination will be used or not. For example in protocols like OSPF, any route change within an area will trigger route updates and subsequently the shortest path algorithm is re-run even if that lost route was never used at all. Proactive routing protocols tend to be more bandwidth consuming and processor hungry. Such proactive protocols are not suitable for low bandwidth military combat radio networks. MANET protocols on the other hand tend to be either reactive such as with AODV (Adaptive On Demand Distance Vector Protocol) or a hybrid of proactive and reactive protocols such as ZRP (Zone Routing Protocol).

A reactive routing protocol only discovers the route when there is a need. Reactive protocols are less bandwidth consuming but that comes at a cost of slower route discovery when compared to their proactive counterparts. Proactive optimized link state routing protocols for MANET also exist such as OLSR (Optimized Link state Routing Protocol). Then there are some hierarchical MANET routing protocols such as CBRP (Cluster Based Routing Protocol). With hierarchical routing protocols the choice of proactive and of reactive routing depends on the hierarchic level where a routing node resides.

Experiment Planning: Each MANET protocol be it Reactive, Proactive, Hybrid or Hierarchical has its pros and cons. Which one is a better protocol depends purely on the characteristics of the mobile routing nodes, the communication bearers and most importantly the operational scenarios in which the protocol is to be deployed. In my research I will analyze bandwidth usage and convergence/route discovery of different MANET protocols in greater depth and complement my findings through MANET simulation results. I will pick a protocol each from different categories of MANET protocols i.e. reactive, proactive and hybrid once I have done my initial study. My main aim being is to identify a MANET protocol that is well suited to military combat radio networks.



Comparison between Digital line and VoIP: Research Proposal

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ABSTRACT

In today's world of competition, organizations have to work very hard so that they get profits and remain in the business. Organizations use a large number of technologies to help them become more efficient. They use phones and Internet for communication with their customers, the middle men and their own employees. Any type of technology that is used requires a large amount of cost. Therefore, it is important that the organization evaluates the costs and benefits from using the technology. There are different types of technologies that an organization can choose from. This study consists of analyzing analogue, digital and VOIP. All these come with different facilities and advantages and different costs. It is therefore important for a company that uses Call Centers to decide which of the two – VOIP or digital – is better. The thesis statement of this proposal is that VOIP has better performance and security than the digital technology and is a better option to both digital and analogue technologies for a call center business.

VOIP has the advantage of low cost of operation but it also needs more equipment (Associated Press, 2013). Many services like call waiting and redirecting are free with VOIP, while the same services are paid services with digital lines. VOIP helps in better connecting different branches of businesses and in making networking better than it is possible with digital technology. This advantage of connectivity is useful for large businesses that have offices in different locations. Small businesses may not need this factor of connectivity so much, and so, they may think that VOIP is not cost effective. In terms of the features and services offered, the digital technology is still ahead of the VOIP technology as it can run on cordless phones, paging, door phones and automatic door lock etc. (Telecom-Solutions, 2013). VOIP offers unified messaging, but this is also possible with new digital phones. VOIP also needs large broadband otherwise it will not function well. Digital phones do not require that. But both digital and VOIP need power to work, unlike the analogue technology that can run even during power outages (Cohen, n. d).

The research will use a descriptive approach and quantitative methods. The research will be done through a survey method where the respondents will be selected from among the IT managers at 10 different Call Centers in the UAE. These Call Centers will be selected on the basis of personal relationship of the managers with the researcher. But an official letter will be sent by the researcher seeking permission. Then the respondent IT managers will be selected in a random manner, and 5 managers will be selected from each of the 10 places. So, the total sample size will be 50. Once the sample is selected they will be given a questionnaire to fill that will contain questions on the costs and performance of VOIP and Digital lines. The survey will be in the form of multiple choice question answers and the respondents will be asked to fill in their choices on their own. The collected data will be analyzed using excel spreadsheets to evaluate the opinions of the IT managers. The results will be presented in the form of graphs and charts.

It is expected that the IT managers will give their opinion on factors like costs, resources needed, and performance and efficiency of both VOIP and Digital Technologies. This information will be based on their first-hand experience of the two technologies in their current or past organizations. So, the data collected will be correct and valid. This data will be used to make the comparison between the two –VOIP and Digital Technologies and then to evaluate if the thesis statement was correct or not. It is also expected that the findings will help in making a recommendation to the Call Centers to increase their use of VOIP services.

References:

- [1] Associated Press (2013). *VOIP versus Digital*. Available at: <http://techtips.salon.com/voip-vs-digital-20908.html>. Accessed on March 23, 2013
- [2] Cohen, J. (n. d.) VOIP vs. Analog Phones. Available at: http://technology.solveyourproblem.com/VoIP/VoIP_vs_analog_phones.shtml Accessed on March 23, 2013
- [3] Telcom-Solutions (2013). *Digital Vs VOIP Debate – Which is best for Your Business?* Available at: <http://www.tel-comp.com/services/digital-vs-voip-debate-which-is-best-for-your-business/> Accessed on March 23, 2013



Fun Security Game

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ABSTRACT

This paper is about creating educational information security games. People should be aware about Information security to prevent attacks and other misuses. Games combine entertainment and education and may be considered as one of the best ways to teach and learn. In addition, educational games have a good impact in understanding and educating students in specific and people in general. As a consequence, the number of attacks may decrease by spreading knowledge of basic security principles. Therefore, we decided to create an educational game for students about information security.

To create the security game involved many steps. We identified the security topics and scenarios. We researched existing educational video games as well as security games. We also researched tools to create video games. We reviewed Adobe Flash, Game Maker and Unity.

Fun security is the name for our game. Fun security consists of three sections, which are Email, Website, and Ethical hacking. In this abstract we outlined the first two sections: email and website. We wrote the scenario and drew a sketch for each level. Ethical hacking section will be explored later on. We used Game Maker to implement the prototypes and plan to use Unity 3D as a primary tool for implementation of the second version. We tested our prototypes and received positive feedback from both students and teachers. By using our Fun security video game students and instructors will help them in applying the theory concepts and methods of security in an easy and interesting way.





Designing Games with option to edit content for the Gulf

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ABSTRACT

Most people when playing games do not relies the real issues of having unethical languages and scenes. Games attract players, but at the same time they may feel uncomfortable when playing the game individually or in front of friends and family because it is forbidden in our society and culture to see unethical languages or scenes. However, there are some games widely distributed over gulf region that contain bad languages, reflect negative on player's personality and addict them to the game. Some games are inappropriate to the country's cultural and religious values. An example of a game with bad language can be found at [1]. An example of a game that promote bad health can be found at [2]. An example of a game inappropriate to the country's cultural and religious values can be found at [3]. Other bad examples promoting anarchy and aggressiveness can be found at [4,5].

The Government is strict with regard to selling electronic games for kids. As examples, "Spec Ops game preview is blocked in UAE" for the same previous issues and there are a lot of research from experts indicate that selling less violent games reduces violent activities. However, lots of parents do not observe that there are some unethical features on these games that reflect on their children's attitude.

Game companies should provide a system that cut unethical languages and cover the bad scenes in order for the player to have the option to play the more suitable version with friends and families and We call it "cut it out system". For example, the player has the option of choosing in the option "cut it out system" to take out unethical languages and cover scenes and change violent actions in game. To reinforce our idea, we are sending surveys to over 100 parents. The survey consists of the following questions:

1) Do have electronic games at your house? How many often the kids in your house play in it?

- Yes
- No

2) What do you think of having a system that cat the bad languages and bad scenes in games and change violent actions in game?

3) Are you willing to pay extra many to add this system on kids games? Why?

Our preliminary result of the survey show 80% of people agree to use this system on the games and they would like to pay additional money for the system and 20% disagree because they felt that children have the abilities to know the right and the wrong thing. If the user use "cut out system" in their games game designing company will gain more profits from selling the games in all over the regain because it is convince the parents to buy it for their children.

References

- [1] Learning bad language
- http://www.youtube.com/watch?v=FePB_QHCJhE
- [2] Bad for health
- Addicted <http://www.youtube.com/watch?v=fIzMPF147YQ>
- [3] Games are Inappropriate to the country's cultural and religious values.
- <http://www.youtube.com/watch?v=KMjeCBJBkhw>
- [4] Games can cause aggressive
- <http://www.youtube.com/watch?v=cqdiFNNxoQ>
- [5] The price for example Anarchy ReignsAnarchy Reigns, ZombiU
<http://www.youtube.com/watch?v=P38j3DN6KuM>



Cryptography in Zayed University: Communication and Wireless Network

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ABSTRACT

At Zayed University students, faculties, and staffs are exchanging very confidential information such as assignments, projects, exams, and other critical data. This means that securing communication and wireless from inside or outside attacks increase the level of confidentiality. Therefore, cryptography can reduce the chance of threat agents to exploit the users' information, as well as it helps the secure the information form new attacks that may appear. This research will discover the implemented cryptography that has used in Zayed University because communicating over the internet has increased the chance of many threat agents or attacks, which are targeting educational institutions for different purposes. Thus, cryptography helps to ensure the confidentiality, integrity, and privacy of the information. As a result, this means that Zayed University system supports the characteristics of information system.

It is well known that security is one of the internet biggest concerns if not the most. In fact, most of the internet users are terrified of the idea of being vulnerable because attackers may hack individuals or organizations' information and using it in appropriate way. Universities should apply some techniques to avoid such situations and to make the internet more secure. Therefore, the suggestion is adaptable and convenient to both students and universities. Cryptography is one of those techniques where an algorithm plain text gets transformed to cipher text (ambiguous language) then get back to plain text. In this way even if hackers did get to the information they will not understand it and they will find difficulty in cracking them. As effective as cryptography may be the question "Is cryptography implemented in Zayed University networks or not?". Therefore, this section will compare the difference encryption algorithm methods, which are public key and private key, as well as it will show how they work.

In this research, we will discuss the implemented cryptography in Zayed University's network and communication by investigating the case through interviewing help desk staffs and Faculties. Moreover, we will try to know which part of networks are covered with cryptography (Zayed University's web site , outlook email ,blackboard, etc.), why, what are the techniques that used for cryptography with certain types of connection(wireless), and finally how cryptography has affected Zayed University's students, teachers, and faculties communications .

However, if the responses were negative we will try figure out the reasons behind not implementing this technology yet and what are the strategies and plans they have regarding cryptography in the future. Finally, regardless of whether cryptography is implemented in the Zayed University or not, we will find some tips and cryptography software to advice students, teachers, and university to using them at least to secure their information and resources such as PGP. In addition, we will try to do an experiment how the students deal with the cryptography.



Telecommunications in the US, UK and UAE

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ABSTRACT

The US and UK have one of the best telecommunication facilities in the world in terms of technology, variety of services etc. As of 2009 in U.S there were 141 million telephone lines and 286 million mobile phone lines, which were operated by five major companies namely AT&T, Verizon, Sprint, Nextel and T.Mobile. In the U.K there were 76 million mobile lines, which were operated by several private entities. In the UAE there were 1.825 million telephone lines and 11.727 million mobile lines which are operated by two major companies Etisalat and DU. Due to absence of private entity there is not much competition between the telecom operators in UAE which has necessitated this study to be undertaken.

In UAE the penetration was 166 % way back in 2007 on account of which the mobile market can be stated to be very mature. There has been tremendous growth due to government initiatives meant to deregulate the market, introduction of competition and the presence of Telecom Regulatory Authority. When DU was introduced Mohamed Al Ghanim, TRA board member and director general has stated that competition is required in the telecommunication sector in order to benefit both business as well as residential consumers since it will not only provide high quality and innovative services but also ensure fair price for the customers. Further the UAE has one of the most sophisticated information infrastructure and the government has spent several billions to develop and maintain a competitive edge in this area. In the US the private operators invite suppliers from different countries to set up the latest service in the country.

The methodology would involve primary as well as secondary research. Since the research is limited to study of the telecommunication system in US/UK and then comparing the same with UAE it is essential that the literature review will play a major part in determining the results of this research. Due to this reason relevant books on the subject, journal articles and reports on the telecommunication in the three countries will be reviewed in detail. Further direct interviews with the customers as well as the senior staff of Etisalat/DU will be undertaken to get their views on the subject. Also the customer opinion will be taken by adopting the SERVQUAL method to access the customer satisfaction level in UAE.

The UAE is a much smaller market when compared to the US or UK on account of which the systems that exist over there cannot be implemented over here. Further the local firms Etisalat and DU are very well established and are providing excellent service to the customers due to which entry of private players is ruled out. Further any entry at this stage will require huge investments for which the returns cannot be guaranteed due to the saturation of the market. Due to this reason the UAE will do well to continue with the existing service providers Etisalat and DU since the people are happy, the market is saturated and there can be no guarantee for good business in this area for any new entrants.

References

- [1] RNCOS E-Services Pvt. Ltd.: UAE Telecom - Subscriber Penetration Saturating, Operators Going for Innovation Anonymous. **M2 Presswire** [Coventry] 02 Dec 2008.
<https://myzu.zu.ac.ae/telecomms/docview/446152725/13C852F26BF6AF289F1/,DanaInfo=.asfcugmFwzx05q57Os54+5?accoutid=15192>
- [2] Research and Markets: Booming UAE Telecom Sector Provides In-Depth Analysis of the Telecommunication Market in the UAE. Anonymous. **M2 Presswire** [Coventry] 26 Feb 2009.
<https://myzu.zu.ac.ae/telecomms/docview/444332896/13C852F26BF6AF289F1/,DanaInfo=.asfcugmFwzx05q57Os54+1?accoutid=15192>
- [3] UAE see further competition in fixed-line telephony service. Anonymous. **Iraq Telecom** 5. 7 (Jul 2007): 15.
<https://myzu.zu.ac.ae/telecomms/docview/191578249/13C852F26BF6AF289F1/,DanaInfo=.asfcugmFwzx05q57Os54+3?accoutid=15192>
- [4] Overview of the telecom market in the UAE
Feller, Gordon. **Africa & Middle East Telecom** 7. 8 (Aug 2006): 1-5.
<https://myzu.zu.ac.ae/telecomms/docview/191676013/13C852F26BF6AF289F1/,DanaInfo=.asfcugmFwzx05q57Os54+7?accoutid=15192>



Spyware Awareness and Solutions

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ABSTRACT

We chose this topic because many students and people are not familiar with spyware. In this report we will discuss details about the spyware. Spyware is a type of grayware. Spyware is a term that refers to programs that spy on your computer, including recording which websites you visit. Spyware is a type of a computer program that is considered a computer virus. It is normally hidden from the user and it is difficult to notice. Spyware is any software that runs on your computer, modifies your system and collects data. The goal of spyware is to gather data from the user computer about personal information and behavior as well as installs programs, change the computer setting, browse history, etc. It is also able to operate without the user's knowledge. It reports information to the advertisers so they can target you with spam, and modify their advertisements when you browse the web, etc. This report will show the effects of spyware, how it affects our computers and types of the spyware. We will show the differences between the strength and weakness of the spyware programs.

Spyware can be defined as software that covertly gathers user information through user's internet connects without his/her knowledgeable (Janczewski, 2008). Spyware is a virus software that can be installed into computers through websites, downloading soft wares, clicking on pop ups and many other applications. Moreover, Spyware is a program that is able to start whenever you restart your computer, it can invisibly track your moves on your desktop and more, or even the internet browser and get you to a different web page that you did not want to. Spyware can gather information as much as it's possible such as personal information, email addresses, accounts, passwords, credit card numbers and etc.

Spyware is software that breaks into your computer to trace your clicks and it programs can record your activities, browsers, and information, in which it can access your private information. It also sends your information through the internet. The Spyware software can harm the computer overall performance, slower the computer and change the setting of the system. As your computer starts running the Spyware began to run and waste its resources such as RAM and CPU, and lead them to crash.

There are many sources in library books and internet databases about Spyware; we are going to collect information in this research through survey that contains 3 questions with a chart as a result, the questions are:

1. Do you know what Spyware is?
 - a. If yes, how did you know it?
 - b. If not, please visit (suggest a website where people can learn about Spyware)
2. Do you know the Spyware effect on your computer?
3. Did you how can you protect your Computer against Spyware?

The reason behind doing this research is to know more about spyware, effects of spyware on your computers and how can you defend your computer from spyware. Moreover, we got references from books, articles and websites, which will help us a lot in finding different, useful and relevant information about spyware and its effects on computers. In addition, we did a survey that we will distribute among different students and instructors from Zayed University, who knows what Spyware is and experienced spyware effects.



Keystroke Recognition

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ABSTRACT

Highly important information needs exceptionally proficient security to make sure it never falls in the wrong hands. Biometrics technologies are great approach since they provide a very reliable way of authentication. Keystroke dynamics technology is to distinguish people based on their typing rhythms. If the typing information is properly sampled and analyzed, this technique can be used in increasing the level of security at the moment of logging in a system. Here, we extracted some features related to timing of the key press and key release. Such as the duration of typed keys, and latency between two consecutive keystrokes. In addition to time related feature, we are using the neural network algorithms in for recognizing person's typing behavior one from another. The results show that the use of the Keystroke Dynamics is simple and efficient for personal authentication.

Introduction

Nowadays, from universities to governments every institution keeps a substantial amount of information on computer systems. Critical information is only allowed for access by specific authorized users and it is paramount that only those users will be able to access it. Protecting such vital data from malicious attackers and unauthorized parties is a very persisting matter for these establishments. The necessity for a more precise procedure of identity verification is even more crucial for data accessing through the web. The need for secure identity authentication is becoming increasingly persistent due to the ever evolving world of technology.

Biometric technology has been an excellent approach for a more robust identity authentication. Biometrics mean are the use of physiological and/or behavioral characteristics to recognize or verify the identity of individuals through automated means. Behavioral (or active) biometrics requires a person to perform some activity to collect information about his identity, such as voice recognition, signature recognition and keystroke recognition.

Physiological (passive) biometrics take a person's body measurement to get his body information such as fingerprint recognition and facial recognition. We find behavioral biometrics, specifically keystroke dynamic to be more compatible with personal identity number (PIN) systems that most establishments use.

This project will be an implementation of Keystroke recognition which depends on user's typing behavior to further verify his identity. It has been proven that a person's way of typing on a keyboard is as unique as his signature when a person types, the latencies between successive keystrokes, keystroke durations, and finger placement on the keys can be used to construct a unique profile for each individual. For PIN systems, the consistent nature of non changing passwords makes identifying the users very straightforward. What makes Keystroke recognition easily implemented is that the only device it needs to gather the needed information is a keyboard (Morose and Rubin, 1999).

Problem Definition

PIN systems are highly prone to malicious attacks and unauthorized access. Providing a stronger protection for crucial information needs an auxiliary authentication stage that prevents any unwanted attacks, while requiring minimum cost and no extra complication of the access process. Keystroke recognition is a perfect solution for this problem.

Aims

- To secure the use of password based authentication process.
- Providing accurate user verification.

Objectives

- Design software that analyzes the individual's typing behavior.
- Keep a record of each user's typing information (user profile).
- Confirm user's identity based on this information.

Project Scope

Using the keystroke dynamics technique to authenticate users when they login in systems.



Volunteers without Limits (VWL) Web based application by web mining technique

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ABSTRACT

Volunteering is any activity that involves spending time, unpaid, doing something that aims to benefit the environment or someone (individuals or groups) other than, or in addition to, close relatives. Volunteering provides the volunteers a great opportunity for personal development; it's a way of gaining confidence and learning new skills or putting your existing skills to good. It can provide you with something interesting, useful and fun to do in your spare time. Volunteering is a great way to communicate with other people who have different knowledge, experiences, and backgrounds. Anyone can volunteer, regardless of age, experience, background, ethnicity, gender, religion, or disability.

Within any community, there will be a wide range of volunteering taking place. However, it's very difficult to find volunteering opportunities, have meaningful roles, and matching volunteers to roles. Moreover, volunteer has no obligation to an organization. They can stop volunteering whenever they like, and do not have to volunteer when they do not want to.

For that we developed a web based application Volunteering Without Limits (VWL) to organize and manage volunteers' activities, allowing volunteers to join available volunteering projects, and notify and encourage members to join new volunteering projects.

VWL adopts Web Usage Mining (WUM) technique which is one of web mining category. It gathers and integrates information using web log files. WUM allows to understand volunteer's behavior, evaluate the effectiveness of web site, and to measure volunteer success. Moreover, from the application point of view; usage mining will improve the performance of the system by utilizing the Error Log and measuring the traffic and visiting purposes.

A well-known process of knowledge discovery in databases (KDD) was adopted to analyze the web data. It consists of four steps with an iterative approach: i) identification of objectives and available data, ii) selection of Web data that generated by visiting the web site, and then store it into log files, iii) preprocessing and transformation to determine user sessions as output, and iv) pattern discovery, Interpretation and evaluation of results, learning and statistical methods are used to extract patterns of usage from the preprocessed Web data.

As a result, VWL will increase the awareness of volunteering and will keep volunteers motivated. It will help volunteers to find appropriate environment to do volunteering work that they are interested in and happy to do it.

