

# المؤتمر السنوي التاسع

## للبحوث الطلابية في مجال الحوسبة التطبيقية

# 9<sup>th</sup> Annual Undergraduate Research Conference on Applied Computing

# "ICT for Empowering Humanity"



April 26 – 27, 2017 | Zayed University | Dubai, United Arab Emirates

## PROGRAM OVERVIEW





Under the Patronage of

**Her Excellency Sheikha Lubna Bint Khalid Al Qasimi**

Minister of State for Tolerance  
President of Zayed University



## URC2017 Organizing Committee

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Andrew Marrington, Zayed University (UAE)

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Nagarajan Chandrashekar

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Rawan Almatham, King Saud University (KSA)

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## 9th ANNUAL UNDERGRADUATE RESEARCH CONFERENCE ON APPLIED COMPUTING

### Message from the Conference Chairs

Welcome to the 9th Annual Undergraduate Research Conference on Applied Computing (URC 2017). The objective of this conference 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, share ideas and interact with other young researchers, faculty members, and technology leaders from the region.

This year we have accepted 167 undergraduate research projects to be presented in several formats, including: lightning presentations, live demos, and poster sessions. The research projects represent over 550 authors, primarily undergraduate students and their faculty advisors, from 23 educational institutions in 8 countries, namely: Egypt, Jordan, Kuwait, Oman, Palestine, Qatar, Saudi Arabia, and the United Arab Emirates.

We would like to thank everyone involved in this conference. First and foremost, we thank the students and their faculty advisors for their submissions to this conference – without their research projects this conference wouldn't exist! We also thank the rest of our team, members of the organizing committee as well as the technical committee who reviewed student submissions and provided valuable feedback. 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 sponsor, Zayed University's Office of Research, for their continued commitment and contributions that help make this conference a reality. Thank you!

This conference would not have been possible without the great efforts made by the local arrangements and registration teams who work tirelessly to ensure everything is running smoothly, and for this we extend a heart-felt thank you to Muna Bader, Izzeddin Asad, Dr. Huwida Said, Nagarajan Chandrashekar, and Alia Sulaiman. We would also like to thank all the student volunteers from Zayed University.

Finally, we take this opportunity to thank Zayed University for hosting this conference.

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



Dr. Andrew Marrington  
Acting Dean, College of Tech Innovation  
Zayed University, UAE



Dr. Qusay H. Mahmoud  
Conference Co-Chair  
Univ. of Ontario Institute of Tech, Canada



Dr. May AlTaei  
Conference Co-Chair  
Zayed University, UAE



## Wednesday, April 26

**8:00am – 9:15am**

**Registration**

Continental Breakfast and Presentations & Demos Setup

**9:30am – 9:45am**

**Opening Ceremony**

**H.E. Sheikha Lubna Al Qasimi**

Minister of State for Tolerance, President of Zayed University

**Dr. Andrew Marrington**

Acting Dean, College of Technological Innovation

**9:45am – 10:15am**

**Keynote: H.E. Ahmed Shabib Al Dhaheri**

Zayed Bin Sultan Al-Nahayan Charitable and Humanitarian Foundation

**10:15am – 11:00am**

**Panel discussion (Opportunities and Challenges for Research, Innovation and Entrepreneurship)**

**Moderator:**

**Ms. Shaikha Ahmed Sultan AlRahoomi AlMheiri**

(Dubai Health Authority)

**Members:**

**Mr. Ahmad Al Tamimi** (British Petroleum, UAE)

**Dr. Omar Alfandi** (Zayed University)

**Ms. Alia Almansoori** (AlMawakeb School, Dubai)

**11:00am – 11:30am**

**Coffee Break**

**11:30am – 12:30pm**

**Lightning Presentations, Live Demos, and Poster Session**, see the detailed program for room numbers (11 lightning presentations, 11 live demos and 62 posters)

**12:30pm – 2:00pm**

**Lunch**

**2:00pm – 2:45pm**

**Keynote: Dr. Michael Allen**

Assistant Provost for Research, Zayed University

**2:45pm – 4:45pm**

**Lightning Presentations, Live Demos and Poster Session**, see the detailed program for room numbers (11 lightning presentations, same 11 live demos and 62 posters as above)



## Thursday, April 27

<b>8:00am – 9:15am</b>	<b>Registration</b> Continental Breakfast and Presentations & Demos Setup
<b>9:30am – 10:00am</b>	<b>Keynote: Ms. Shatha Alhashmi</b> (Mohammed Bin Rashid Centre for Government Innovation)
<b>10:00am – 10:30am</b>	<b>Keynote: H.E. Dr. Amna AlDahak AlShamsi</b> (UAE Ministry of Education)
<b>10:30am – 11:00am</b>	<b>Coffee Break</b>
<b>11:00am – 12:30pm</b>	<b>Live Demos and Poster Session</b> , see the detailed program (10 live demos and 62 posters)
<b>12:30pm – 2:00pm</b>	<b>Lunch</b>
<b>2:00pm – 4:00pm</b>	<b>Live Demos and Poster Session</b> , same demos and posters as above
<b>4:15pm – 5:00pm</b>	<b>Awards and Closing Remarks</b>



# *Keynote* Speakers



## **H.E. Ahmed Shabib Al Dhaheri**

H.E. Ahmed Shabib Al Dhaheri is the General Manager of Zayed Bin Sultan Al-Nahayan Charitable and Humanitarian Foundation. He is a prominent and well-respected member of the UAE business community. H.E. Al Dhaheri serves as a Board and Honorary member of a number of significant companies, authorities and commissions, which is evidence of his vast knowledge, expertise and vision including: Abu Dhabi Investment Company (2000); the National Human Resources Development and Employment Authority (2000–2003); Member of the Board of Directors of Gulf Air (1992–2005); Board Member of Abu Dhabi Fund for Development (1993–2006); Member of the Committee for the Development of Human Resources in the Banking Sector (1997–2006); Member of the Board of Directors of the Bank of Tunisia and the UAE (1989–2010); and Member of the Advisory Board of the Supreme Council of the Gulf Cooperation Council for Gulf Arab States (2003–2010). H.E. Ahmed Shabib Al Dhaheri was awarded a Bachelor's degree in Economics and Finance from the University of La Verne, United States, as well as a Master's degree in Business Administration from Abu Dhabi University, UAE.



## **Dr. Michael Allen**

Dr. Michael Allen is Assistant Provost for Research at Zayed University, having previously served for five years as Dean of the College of Arts and Sciences. He has also held positions at the University of Auckland (New Zealand), the University of California at Berkeley, Brigham Young University, and the University of Victoria (British Columbia, Canada). He has extensive experience in international education, and has traveled widely both for his own research and to build programs and partnerships between universities. Trained as a historian, Dr. Allen received his Ph.D. degree from the University of Washington and his Master's degree from the University of California at Berkeley. He holds undergraduate degrees in both History and Asian Studies from Brigham Young University. Dr. Allen is a specialist on East Asian history in the 19th and early 20th centuries, and has traveled numerous times to China, Japan, and Korea (both North and South). Most of his research has focused on Korea in the 19th and 20th centuries. He also has a deep interest in world history, and his publications include books and articles on nationalism in East Asia, intellectual history, historiography, and the history of the world since 1500.

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**Ms. Shatha Alhashmi**

Ms. Shatha Alhashmi works for the UAE's Prime Minister's Office as a Director in the Mohammed Bin Rashid Centre for Government Innovation. Ms. Shatha has over a decade of experience in policy and strategy development, as well as being an entrepreneur. In her most recent role with the Abu Dhabi Council for Economic Development, Shatha was responsible for strategy and performance. Prior to moving to Abu Dhabi, Shatha spent over six years at the Executive Office where she held various roles within the Economic Intelligence Unit and the Chairman's Office. Shatha is interested in innovation in the public sector and social entrepreneurship, and is passionate about youth development.



**H.E. Dr. Amna AlDahak AlShamsi**

H.E. Dr. Amna AlDahak AlShamsi is the Acting Assistant Undersecretary of the Activities Sector at the Ministry of Education, UAE. She is also the the Director of Innovation and Entrepreneurship Department at the ministry. She has worked in various high profile projects across the ministry and schools to increase student creativity, innovation and knowledge. Under her active leadership, students engaged in diverse innovative activities across all sectors and participated in well-known local and international competitions/exhibits. H.E. Dr. Amna AlDahak AlShamsi was awarded a PhD degree in Engineering from Khalifa University, Exploring High-risk Fire Areas for Victims Using an Autonomous Mobile Robot.



## *Panel* Members

### **Panel Discussion**

#### **Panel: Opportunities and Challenges for Research, Innovation and Entrepreneurship**

The region is emerging as a hub for education, research, innovation and entrepreneurship. Universities are striving to enhance their applied research portfolios, and establish rewarding industry-academia collaborations.

This panel will address and discuss the challenges faced by academics interested in establishing applied research programs, the opportunities seen by industry, and explore possible solutions and successful research strategies and models. Distinguished members of this panel will explore answers to questions, such as: (1) why research and innovate, and what incentives exist for doing that? (2) what does it take to transform a teaching university into a centre of excellence for research, innovation and entrepreneurship ? (3) what are some of the available sources for research funding and startups in the region? (4) how to foster collaboration between industry and academia? plus other related questions from the audience



#### **Ms. Shaikha Ahmed Sultan AlRahoomi AIMheiri**

Ms. Shaikha Ahmed Sultan AlRahoomi AIMheiri is holding a Masters Degree in Business Administration (MBA) from University of Hull – England, in 2009 and a proud winner of the prestigious Emirates Women Award, Professional Category- in 2016 for her contribution to different personal and professional aspects. She is the Director of Customer Relations Department in Dubai Health Authority with more than 17-years work experience with different job titles and functions. Under her strong leadership, she managed and pioneered various high profile projects across the Government of Dubai. Ms. Shaikha lead the Innovation Team at Dubai Health Authority level for 3 years and won 12 awards in Hamdan Bin Mohammad Award for Smart Government.



#### **Ms. Alia Almansoori**

Ms. Alia Almansoori is an ambitious 9th grade student at AIMawakeb school in Dubai. She has recently won first place in the Genes in Space competition for her genetics research proposal. Alia is head of both the Genetics and Innovation clubs at her school which supports students to pursue science and be innovative. Her hobbies include writing poetry, playing football, and reading.

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### Mr. Ahmad Al Tamimi

Mr. Ahmad Al Tamimi has joined BP in 2012 as a Communications and External Affairs Manager for BP Dubai's downstream business. In addition to supporting the upstream C&EA team in the region including the UAE, Oman, Iraq, and Kuwait, Ahmed looks after enhancing and maintaining the long term relations of BP with its key stakeholders, and community through continuous engagement, and social investment sponsorship opportunities.

Before joining BP, Ahmed was leading the internal sales management team for Dubai properties for four years, where he revamped the inventory management system for the organization which helped reducing and managing raud in an efficient way. Ahmed has also gained experience while working at HSBC bank for 7 years in different roles. Ahmed has a Higher Diploma in Banking from Emirates Institute for Banking and Financial Studies.

Ahmed has a long history with social investment programme, as he started volunteering at young age in different community initiatives, such as Emirates Foundation, BP Young Adventurers Programme, Shaikh Mohamed Cultural Understanding Centre, and Dubai Cares Foundation. Ahmed is extremely talented in relationship management, enhancing existing social investment programmes, problem solving, and creating a positive and comfortable atmosphere for his peers and trainees he leads.



### Dr. Omar Alfandi

Dr. Omar Alfandi is an Associate Professor at the College of Technological Innovation at Zayed University. He holds a Doctoral degree (Dr. rer. nat.) in Computer Science and Telematics from the Georg-August-University of Goettingen - Germany in 2009. He received his M.Sc. degree in Telecommunication Engineering in 2005 from the University of Technology Kaiserslautern - Germany. Between 2009 and 2011, he enjoyed a Post-doctoral Fellowship at Telematics Research Group and he founded a Research and Education Sensor Lab where he is currently as Lab Advisor. Before that he carried his Doctoral Research as part of an Industry, Academia and Research centers collaboration European Union (EU) project. Dr. Alfandi was working package leader of EU DAIDALOS II in the 6th framework project. He published numerous articles on Authentication Framework for 4G Communication Systems, Future Internet and Trust and Reputation Systems in Mobile ad hoc and Sensor Networks. He is the co-founder and co-director of the SMART (Sensors and Mobile Applications Research and Education) Lab at CTI. His current research activities are directed towards Internet of Things (IoT), Security in Next Generation Networks, Smart Technologies, Security Engineering, Mobile and Wireless Communications. In August 2015 he was appointed as the Assistant Dean for Abu Dhabi Campus.



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Innovative Research to Support the  
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