



TRANSFORMING THE
FUTURE OF THE UAE
THROUGH IT INNOVATIONS

THINK
BIGGER

2016/2017
Annual Report



LETTER FROM THE DEAN



It is with great pleasure that I share with you this 2016-17 Annual Report of the College of Information Technology (CIT), United Arab Emirates University (UAEU). In this year, we maintain our pledge and commitment to our student and the country's national agenda. This is accomplished through a relentless pursuit of our mission to ingrain a sustained societal impact through information technology education and research. In this report, we highlight initiatives that addresses various facets of the college's strategic and operational priorities including enrollment management, research excellence, programmatic developments, graduate education, accreditation, and strategic partnerships.

Enrollment management is a strategic priority of the college. In that regard, we continue our emphasis on student success through a variety of advising, mentoring, tutoring initiatives. We have adopted and used DegreeWorks for streamlining our advising and academic planning processes. We have put significant time and resources into the development and execution of comprehensive marketing and recruitment plans for undergraduate and graduate programs. These plans address our key audiences, notably prospective students and their parents along the recruitment funnel.

Emphasizing the college's leadership in IT research and its role as a key player in the nation's goal towards a knowledge-based economy, the college developed a research strategy emphasizing innovative research that targets strategic sectors of the UAE economy. The plan ensures the college's contribution to the nation's strategic goal of becoming a knowledge-based economy. Aligned with the college's research vision and mission, we established programs that aim to support faculty partnerships with their counterparts at renowned academic institutions, to support faculty-student research, and to support the establishment of research groups within the college. We have also instituted an Invited Speaker series involving world-renowned researchers. We have initiated a college-wide effort to review and streamline existing undergraduate and graduate program offerings. Thus far, we approved (at the college level) several curriculum changes most notably the revisions of the BS in Software Engineering program proposal, and a substantial revision of the BS in IT program.

Graduate programs are at a critical juncture as all the college's graduate programs are either flagged for low-enrollment or not having any students. We have suspended three master programs and have developed a plan for ongoing assessment and improvements of the remaining programs in a manner that responds to the strategic needs of the country, as well as market demands. We have approved a new Ph.D. program in Informatics and Computing. The program establishes an integrated research platform through the fusion of computer science, computer engineering, software engineering, cyber security and information systems disciplines. The aim of the program is to develop intelligent solutions (technologies and systems) that are capable of addressing problems of societal impact such as those identified in the UAE's 2021 National Agenda.

We have proactively built relationships with industry leaders such as IBM, Dell-EMC, and SAP (SAP Co-Innovation lab), to introduce our students to state-of-the-art technology and bolster industry-university research. We continue to forge close relationship with government and industry entities and to leverage such relationship to continuously facilitate and support program development, recruiting and fundraising. Examples include the Al Ain Municipality, Abu Dhabi Police, Telecommunication Regulatory Authority, Institute for Applied Technology, and Imperial College London Diabetes Center, Abu Dhabi.

The college successfully hosted its 12th International Conference on Innovations in Information Technology (IIT). We had a significant number of high quality submissions from 21 countries resulting in a total of 47 presentations and 10 posters. We also fostered our commitment to our alumni and the community at large by hosting the Industry Day and the 10th IT Marathon. We deeply appreciate the Information & Communication Technology (ICT) Fund for sponsorship this year's IT Marathon.

To provide our students with international exposure, we continue to seek and support international collaborations. In that regard, the college is engaged in a partnership with Jeju National University (JNU) in South Korea. We are currently planning for sending a select group of students to JNU to take advantage of this partnership.

This has been indeed a remarkable year! I feel deeply indebted to UAEU senior leadership team, specifically, Dr. Ali Al Noami, Dr. Mohamed Albaili and Dr. Ghaleb Al Hadrami for their keen and ongoing support and I am grateful for the opportunity to work with an excellent team of faculty and staff, students, alumni, and advisory board members without whom none of this would be possible.

Omar El-Gayar, Ph.D.

Dean, College of Information Technology

A VISION FOR RESEARCH EXCELLENCE FOR 2021 AND BEYOND

PREAMBLE

The college seeks to foster high quality research and to improve the college's long-term research capacity by establishing and executing a research strategy, that is designed to deliver excellent research outcomes commensurate with UAEU's strategic priorities and the national drive towards a knowledge-based economy. This strategy comes timely with the UAE Vision 2021, and the nation innovation strategy, which states that "Innovation, research, science and technology will form the pillars of a knowledge-based, highly productive and competitive economy, driven by entrepreneurs in a business-friendly environment where public and private sectors form effective partnerships." CIT's strategy is also aligned with the UAE University's mission as a research-intensive university.

VISION

Become the MIT of the middle-east for Information Technology education and research. CIT will serve as the engine and catalyst for the Middle Eastern Silicon Valley.

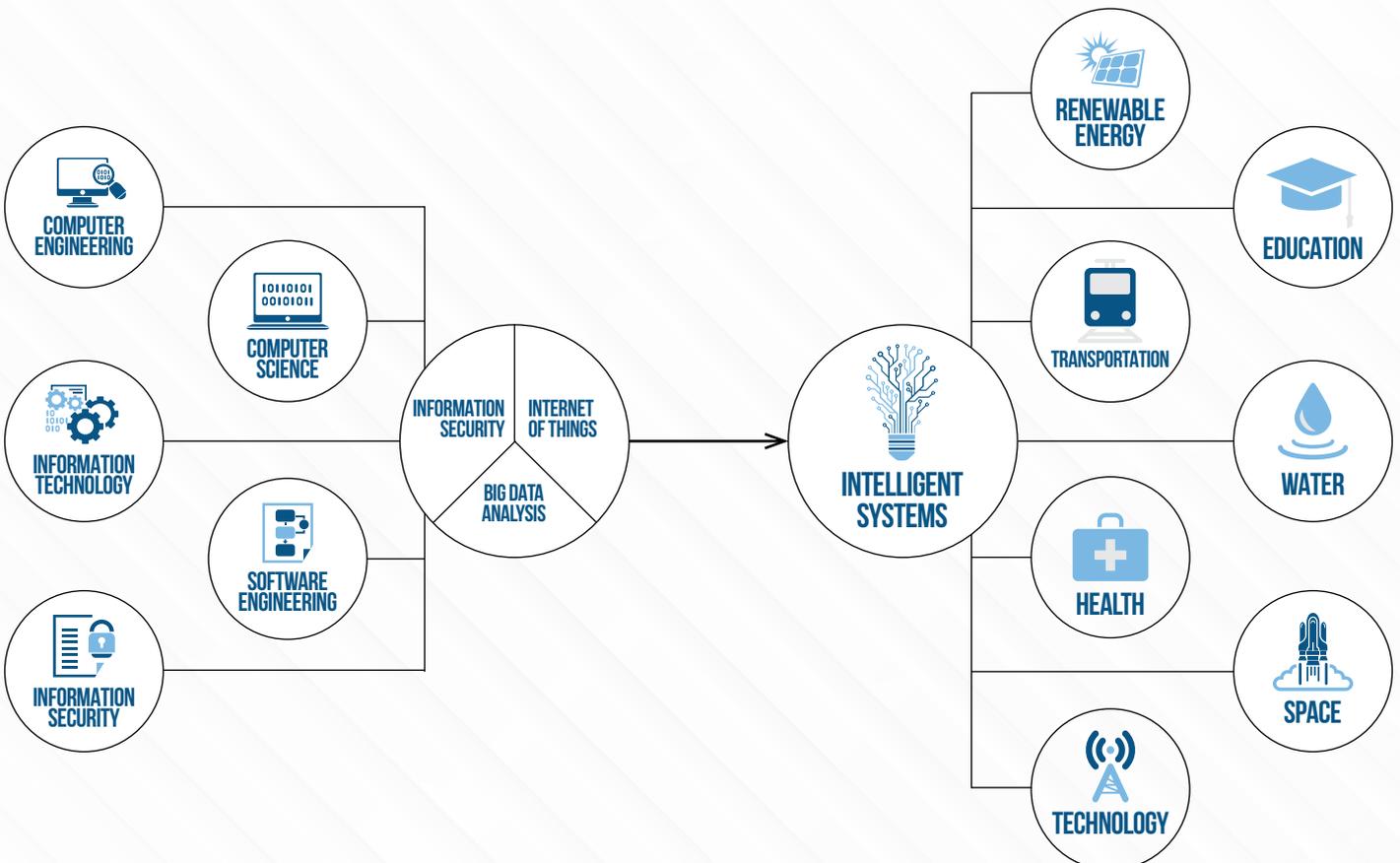
MISSION

To ingrain a sustained societal impact through Information Technology education and research.

RESEARCH THEMES

CIT research is inherently applied, yet strongly rooted in foundational information technology related disciplines such as computer science, computer engineering, software engineering and information systems and security. A unifying theme of CIT research is the fusion of these disciplines to develop intelligent solutions (technologies and systems)

that are capable of addressing problems of societal impact such as those identified in UAE's 2021 National Agenda. Research solutions at CIT aim to leverage and develop capabilities that sense, collect and transmit a wealth of data (Internet of Things), in order to secure data on transient and at rest (information security), and to be able to process large amounts of data for decision making and support (Big Data Analytics).





INFORMATION SECURITY

Information security is the practice of defending assets such as data, software and hardware from unauthorized access, use, disclosure, disruption, modification, inspection, recording or destruction. Nowadays, information security is a national and a global priority.

Current CIT research in information security includes: Security and Privacy in UAVs, Security in Smart Grid systems, Performance Enhancements of Firewalls and

Intrusion Detection systems, and Privacy and Anonymity of Health Care Data. The over-arching themes of information security research at CIT include: Securing Body Area Networks for Health Care Monitoring, Securing Data & Communication in Smart Grid Networks, Securing Data & Communication in UAVs, Big Data & Cloud Computing Security, and from the IoT to the WoT: Security Challenges.

INTERNET OF THINGS (IOT)

Nowadays our world is densely overlaid with "smart" objects that are embedded with electronics, software, sensors, actuators, and networking capabilities. The steadily increasing deployment of those "things" and the advancement of the associated technologies will make for remarkable social and economic impacts. As the key enabler of this vision, the Internet of Things (IoT), defined as an internetworking infrastructure that connects the numerous smart objects globally, is projected as the direction towards realizing intelligence-over-intelligent-systems that synergistically interact and cooperate to usher new and revolutionary services. The benefits of IoT have emerged ubiquitously over various levels of social and economic domains.

The spectrum of research required to achieve IoT at the scale envisioned for it requires significant research along with technological development in order to support and enable IoT applications. These related research themes and technologies include: Identification and Authentication, Communications and Networking, Embedded Devices and Electronics, Cloud Computing, Software and Services, Data Analytics and Management, Security and Privacy, and Standardization.

& ANALYTICS BIG DATA



Data analytics is the process of analyzing data to retrieve and generate valuable information to support decision at making at different levels. Depending on the level of analysis and the value it provides, the obtained information can be useful for various entities in various ways. Data analytics has now become a necessary tool for almost all entities and organizations.

In CIT, we observe the cutting-edge research in data analytics

by experts who are working in different problem domains, including health-informatics, bio-informatics, big data analytics, network security, smart city and cloud computing. Although these are the major research themes under the umbrella of data analytics in CIT, other areas of research within CIT, such as sensor networks, vehicular networks, internet of things, robotics, smart grid, and software security, are also starting to incorporate analytics components into their research.



STUDENTS ACHIEVEMENTS AWARDS & COMPETITION



Embedded Security Challenge (ESC): Ten teams from various UAE universities and the Gulf region participated in this competition using a red team/blue team approach to mimic real-world attacks. Contestants must exploit the weaknesses of a target system, assess the effectiveness of their hardware security techniques, identify vulnerabilities and implement effective defense mechanisms. The CIT team consisting of four undergraduate students Maitha Salem Al Zeyoudi, Wedaad Saeed Al Dhanhani, Aisha Hasan Al Shehhi and Maryam Al Ali won the 4th place among ten participating teams. The CIT team was the only team consisting entirely of undergraduate students. ESC is an educational, research-oriented tournament aimed at hacking into the hardware of embedded systems. In fact, it's the oldest hardware security competition in the world. Finalists compete at CSAW on-site in New York, Abu Dhabi, and Kanpur before a judges' panel of security experts.



The Fall University Programming Contest (UPC), was held on Wednesday, November 16, 2016 at the College of IT. The contest provided an excellent opportunity for students to show their problem solving and programming skills. The contest also aims at preparing our students for similar national and international competitions. Each team was made up of a maximum of three students. The contest lasted for 4 hours. It was very exciting, seeing the students competing against each other in this friendly educational contest. The contestants were given 9 problems to solve. The winning team (Abdulla Al Awadhi, Khaled Al Neami and Sultan Al Shehi) solved 7 out of the 9 problems. The second team (Abdelrhman Al Harahsheh and Wael Othman) solved 5 problems. The third team (Sara Sultan Al Saedi, Mariam Saeed Al Mansoori & Athra Al Khatri) solved 4 problems. Four teams solved 3 problems, five teams solved 2 problems, six teams solved 1 problem and the remaining teams did not solve any problem.



Two Information security undergraduate student teams from participated in GE DigiNation Hackathon computation that was organized by General Electric (GE) at the American University of Sharjah, November 18 – 19, 2016. The participants were asked to create cool apps and hacks towards a smart ecosystem built around a GE business. One of the CIT teams won the 3rd prize and the other one won the best presentation and marketing prize

Khaled Al Nuaimi and Abdullah Al Awadhi, scooped first place in the Computer Programming category in the Emirates Technology and Innovation Competition (ETIC) in Abu Dhabi, April 11-13, 2017. They were coached by Dr. Saad Harous. ETIC 2017 was jointly organized by Khalifa University and the Ministry of Education. The competition was an opportunity to discover bright Emirati minds with the capacity to excel in a variety of IT fields.



Two CIT students, Athra Al Khatri and Nouf Al Saedi, under the supervision of Dr. Saad Harous, won the audience choice prize for their ground-breaking and important inventions to help people with the growing problems of autism, obesity and diabetes, at the Annual NYUAD International Hackathon, a three-day programming marathon which took place from April 13-17, 2017 in Abu Dhabi. Athra Al Khatri's team worked on a project called Teslam تسلم, a tool to visualize actionable data related



to non-communicable diseases (NCDs) in the Arab world, specifically obesity and diabetes, through big data and machine learning, to share with government and business entities, and to educate the targeted subjects of these diseases through a conversational intelligent chat bot. On Athra's team were Farah Shamout (PhD Student, University of Oxford, UK), Harini Kannan (Research Software Engineer, Google, US), Khalid Machchate (CEO, K&W Technologies International, Morocco), Shahan Ali Memon (Carnegie Mellon University, Pakistan), Leanne Dsouza (Middlesex University Dubai, UAE), Khalid Al Awar (Khalifa University, UAE), Ibrahim Soltan (Carnegie Mellon University, Qatar) and Daria Zăhăleanu (NYUAD, UAE). Nouf's team worked on a project called Tabboush طبوش, the name of a virtual pet companion to assist autistic



children in coping with everyday tasks. Working with Nouf Al Saedi were Bassem Dghaidi (Technical Director, SE Factory, Lebanon), Muneeza Patel (MIT, McKinsey, UAE), Dani Arnaout (CTO, Saily, Lebanon), Randa El Behery (Cairo University, Egypt), Hera Arif (Abu Dhabi University, UAE), Anas Einea (University of Sharjah, UAE), Alaa Maarouf (Lebanese American University, Lebanon) and Noura Ismail Hussain (Khalifa University, UAE).



A group of students composed of Athra Al Khatri, Alyazia Al Khyeli, and Mariam Al Mansoori obtained the Second place in the Software Trade Show competition (Software category) held at Wollongong University in Dubai, May 20, 2017. Nearly 35 teams from various

universities across the region recently participated in the University of Wollongong in Dubai's (UOWD) Annual Software Development Trade Show (SDTS), the UAE's largest inter-university software trade show featuring topics including Virtual reality,

learning facilitators, and games. The same group of students won the first best graduation project for spring 2017. The project proposed a solution to bridge the gap between the personalized online shopping experience and in-store shopping experience, as well as help users make healthier and more suitable choices that protect their health conditions. Through utilizing machine learning algorithms to classify users' health profiles, and display an appealing, and customized augmented reality content. This will allow users to have shorter and more beneficial grocery shopping journeys, as well as monitoring their diets and shopping habits.

ALUMNI REUNION

The college organized the CIT Alumni Reunion on November 29, 2016 in parallel with the 12th International Conference on Innovations in Information Technology (IIT'16). The college invited all CIT alumni to the conference also; more than 70 alumni attended the reunion. The event program included lectures about Internet of Things (IOT) and a discussion panel about alumni experiences after graduation to advice the current IT student with the best practices and lessons.





IT MARATHON

The College of Information Technology at UAEU organized and hosted the 10th IT Marathon to expand young minds' and their enthusiasm for information technology and to encourage IT innovation. Nearly 350 students, from throughout the UAE, took part in the competition with special efforts being

made to involve students with special needs. This year event included the following competitions: IT Contest; IT Showcase; IT4Kids; IT4kids "Smart World" and IT 4 Special Needs. www.cit.uaeu.ac.ae/en/itmarathon/

In preparation for the IT marathon, several seminars on the various topics of Information technology

were given by faculty members to high school students as part of their visits to schools around the UAE. The college expresses its sincere appreciation to the Information & Communication Technology (ICT) Fund for sponsorship the event in the amount of 200,000 AED.



STUDENT EXCHANGE PROGRAM

Six CIT Students benefited from the international internship opportunities supported by the college and completed their internship successfully at RIKEN BSI-TOYOTA Collaboration Center, Japan.

- Ibrahim Bazarahin had his training in fall 2016 for two months.

- Mahra Al Shamsiin, Laila Al Nuaimi, Fatma Al Jallaf and Fatima Al Neyadi had their training in spring 2017 for two months.
- Nine CIT male students will have their 2017 summer student exchange program course at Jeju University, Korea.



STUDENT AWARD CEREMONY

The College of Information Technology organized Students Award ceremony on Sunday May 14, 2017 to honor outstanding students for their participation in:

- Competitions and exhibitions inside and outside the University.
- Highest achievement at CIT (Dean's list).
- CIT Association female and male students who participated in organizing events at CIT.

IT INDUSTRY DAY



CIT organized the IT Industry Awareness Day on February 22, 2017 to raise students' awareness about the significant role of IT in the development of the knowledge economy in UAE, and give students an opportunity to meet government and private IT operators in order to build ties that lead to mutual awareness, interest, and various opportunities for collaboration such as internship or academic sponsorship or job opportunities. Around 500 students and alumni visited the event in addition to 54 high school students. Overall, thirteen organizations have participated in this event, including private, semi-government, and government organizations. These organizations are:

- Etisalat British Telecom Innovation Centre (EBTIC)
- Fujitsu Technology Solutions
- ESRI
- General Electric
- Abu Dhabi Securities Exchange
- STRATA
- Masdar Institute
- Abu Dhabi Investment Council
- Etihad Research & Development LLC (Subsidiaries of Etihad Holding)
- Abu Dhabi Department of Finance
- HR Government of Fujairah
- Center for Career Placement and Alumni – UAEU
- Teaching Assistant Program – UAEU

THANK YOU CIT PARTNERS



INTERNSHIPS

CIT enables a broad range of internship opportunities that provides significant hiring advantages to students in their areas of specializations. During the academic year 2016/2017, CIT secured internship placement for 61 student in leading domestics private, semi-government, and government organizations such as Abu Dhabi Autonomous Systems Investments-Al Ain, Abu Dhabi Chamber of Commerce-Al Ain, Abu Dhabi Education Council (ADEC), Abu Dhabi Judicial Department-Abu

Dhabi, Abu Dhabi National Oil Company (ADNOC)-Abu Dhabi, Abu Dhabi Police-Abu Dhabi, IT Department, ADSIC, Ajman police, Al Ain Civil Defense, Al Ain Distribution, Al Ain Hospital-Al Ain, Al Ain International Airport, Al Ain Municipality and Town Planning-Al Ain, Al Ain Police Al Ain, Al Ain Wildlife Park & Resort-Al Ain, Al Fujairah e-Government-Al Fujairah, Al Rowad IT Solutions, Baheya Ali AL-Orimi, Emirates Nuclear Energy Corporation (ENEC), Etihad Airways., Etisalat BT Innovation Centre

(EBTIC), Higher Colleges of Technology, Injazat, Ministry of Foreign Affairs, National Center of Meteorology & Seismology (NCMS), RAK e-government, RIKEN BSI-TOYOTA Collaboration Center Japan, STRATA, Tecom Group, Telecommunications Regulatory Authority - (Oman), The Executive Council - Dubai, Thuraya - Sharjah, and TRANSCO - Abu Dhabi.

The internship Unit provided a number of training opportunities for CIT students to prepare for the job market.



CURRICULUM DEVELOPMENT

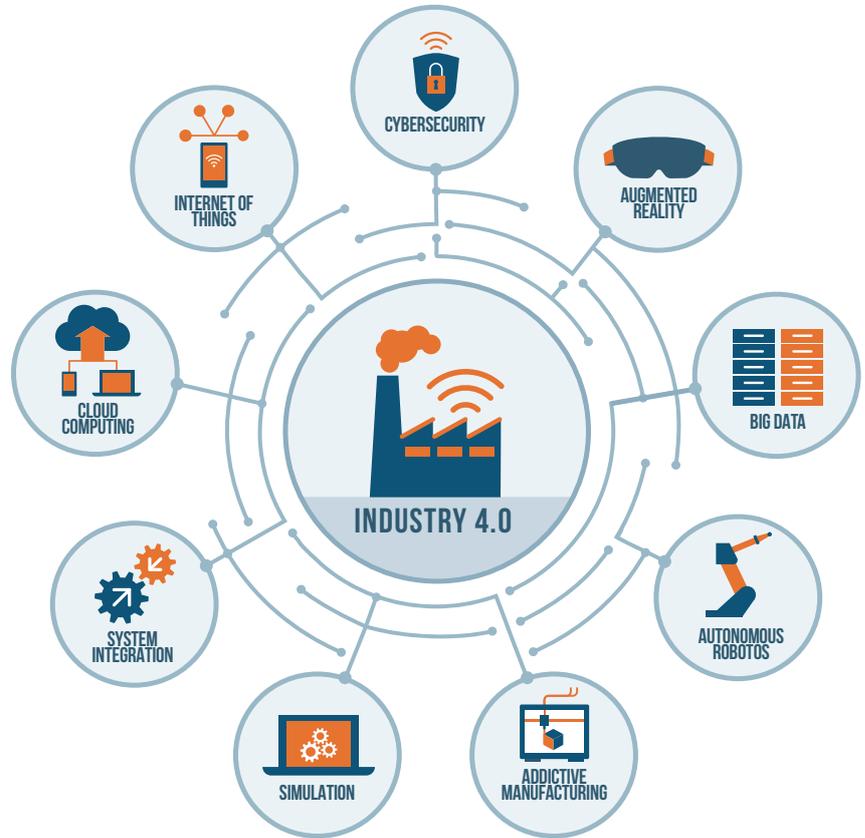
TRANSFORMING THE BSc IN IT PROGRAM

The current BSc in IT program is composed of core courses, in addition to specialization courses, which covers the 2008 ACM model curriculum body of knowledge. However, the 2017 ACM model is now available as a draft based on which some changes to the program will be needed as new areas of knowledge are introduced. The proposed changes to the current program are mainly triggered by the following factors:

1. Alignment with the 2017 ACM model curriculum
2. Alignment with future trends in IT, namely Industry 4.0
3. Accommodation of recommendations from ABET reviewers
4. Responsiveness and agility to respond to changing needs
5. Input from the CIT advisory board:
6. Alignment of program structure with other programs

INDUSTRY 4.0 - the digital transformation

3rd platform, innovation accelerators, OT and manufacturing meet in transformation

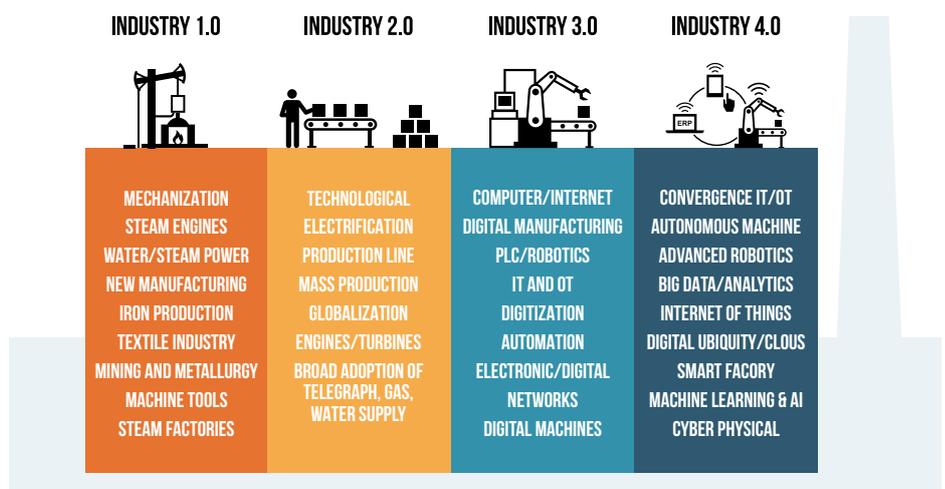


DEVELOPING A NEW PhD IN INFORMATICS AND COMPUTING PROGRAM

Offering the PhD program in Informatics and Computing comes timely with the UAE Vision 2021, and the nation innovation strategy. The program is also aligned with the global job market trends. The 2016 World Economic Forum on the future of jobs argues that the world is on the cusp of a "Fourth Industrial Revolution."

The program will contribute to making the UAE University a world-class research University. Students of the program will work side by side with the program faculty to advance

From industry 4.0 to fourth industrial revolution



information technology and sciences, and develop research solutions in areas strategic to the nation. The program's scholarship is driven by a sense of public service in the field of Information, Communication,

and Computing Systems, and the obligation to produce and disseminate knowledge that will improve the quality of life in the nation, the region, and worldwide.

RESEARCH INITIATIVES

During this year, the college pioneered three new initiatives to foster high quality research and to improve the college's long-term research capacity. The aim was to establish a research framework that is designed to deliver excellent research outcomes. These initiatives come timely with the **UAE Vision 2021**, and the nation's innovation strategy. The initiatives are also aligned with the UAE University's mission as a research-intensive university.



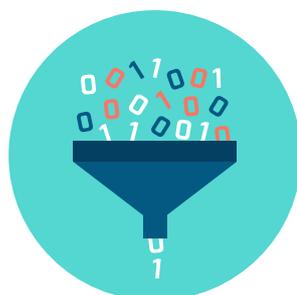
CIT RESEARCH GROUPS

The aim of the initiative was to provide research groups that were able to successfully engage in strategic sponsorship/partnership/collaboration with national/international entities with the opportunity to establish a future interdisciplinary research center in intelligent systems. The minimum expectation of the first year after the group inauguration is one grant submission to an external agency. Three Research Groups approved by the College Council are: Big Data Analytics, Information Security and Internet of Things



FACULTY COLLABORATION WITH TOP 100 UNIVERSITIES

The second initiative establishes research projects in collaboration with top 100 world ranked universities. This initiative is very important as it has immediate and direct impact on research quality and the university overall ranking. Research Collaboration has been established by the college faculty with researchers at nine of the top 100 world-ranked universities.



FACULTY-STUDENT RESEARCH

The third initiative was designed to encourage the involvement of undergraduate students in research. Faculty were invited to submit research proposal for research funding up to 40K AED. The funding is provided for one year and is expected to involve undergraduate or graduate students. The faculty are expected to utilize the fund to have a measurable scholarly outcome. The minimum expected scholarly output is a paper submission to an IEEE- or ACM-indexed conference.

FUNDED RESEARCH

- Three Center-based grants (1,215,000 AED).
- Five startup funds grants (1,680,000 AED).
- Four UAEU Program for Advanced Research (UPAR) research grants (1,197,000 AED).
- 13 Summer Undergraduate Research Experiences (SURE) grants (658,148 AED).



INNOVATIONS TO ACHIEVE TANGIBLE BENEFITS

Faculty at CIT have produced over **75 publications** in international journals and conferences since September 2016. A summary of the research output is given below:

27

JOURNAL PAPERS

43

CONFERENCE PUBLICATIONS

6

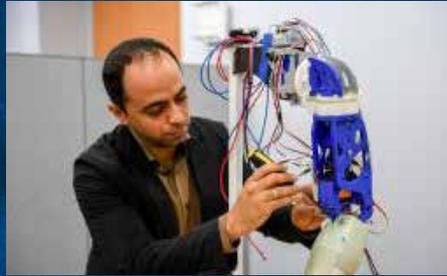
BOOK CHAPTERS

2

KEYNOTE TALKS



CIT TEAM DEVELOPS A ROBOT THAT CAN BE CONTROLLED BY HUMAN MOTION



CIT PROFESSOR DEVELOPS A SMART SUIT TO HELP STROKE VICTIMS



UAEU-DEVELOPED DRONE TECHNOLOGY AIMS TO SAVE LIVES OF DISASTER VICTIMS

CONFERENCES & WORKSHOPS



INNOVATIONS'16

To reinforce the national status and international reputation of the university, the college organized the 12th International Conference on Innovations in Information Technology (Innovations'16), which was held at the College of Information Technology, UAE University on November 28, 2016.

Innovations'16 brought together research scientists and industry professionals to discuss contemporary developments, which are at the forefront of information technology and its applications to better serve economies and societies.



THE FOURTH ANNUAL EMIRATES INFORMATION SECURITY DAY:

The College of Information Technology at UAEU hosted the Fourth Annual Emirates Information Security Day on Tuesday April 18th 2017. The event offers a great venue for Information Security Scientists and government specialists to present their research outcome and to discuss challenges related to information security. A number of universities and government agencies participated in this year's event.

OTHER EVENTS

- Sketch thinking workshop, CIT March 1st 2017
- How we started our Design Thinking firm: OrikamiLab's Hiten Nainaney, January 19.
- Human Centered Innovation by Journey2Creation (Berlin), Feb 9, AstroLabs

DISTINGUISHED LECTURES



- 'Robotics in Rehabilitation' by Dr. Peer Mohamad Muhamed Ali.
- 'The Industry 4.0 and Big Data: Challenges and Opportunities' by Prof. Dr. Klaus Turowski and Dr. Naoum Jamous.
- 'Big Stream Data Analytics: Current & Future Trends' by Dr. Latifur Khan.
- 'Blockchain: Status and potential' by Dr. Rahma Beaugrand.

MARKETING ACTIVITIES

The college is engaged in a comprehensive student marketing and recruitment plan. Initiatives include:

- Developing of landing pages for the whole CIT and the offered programs.
- Developing of promotional videos for CIT.
- Designing flyers for CIT and all offered programs (4 undergraduate and 3 graduate programs).
- Launching social media channels on Facebook, Tweeter and Instagram.
- Advertising on digital media.

NEW FACULTY

It is with great pleasure that CIT welcomes four new faculty members:



Dr. Ali Ouni

Assistant Professor,
Department of Computer
Science and Software
Engineering



Dr. Amir Ahmad

Assistant Professor,
Department of Information
Systems and Security



Dr. Fida Dankar

Assistant Professor,
Department of Information
Systems and Security.



Dr. Maryam Yammahi

Assistant Professor,
Department of Computer
and Network Engineering

FACULTY AWARDS



Dr. Heng Yu won

Best paper
award in the 17th
ACM Conference
on Computing
Frontiers.



**Dr. Zouheir
Trabelsi**

Awarded the
College Research
Excellence
Award.



Dr. Salah Bouktif

Awarded the
College Service
Excellence
Award.



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