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**Her Royal Highness Princess Lolowah Al Faisal**  
The Vice Chairperson of the Board of Trustees and  
General Supervisor of Effat University



# EMBEDDING INTELLIGENCE

L&T 2018

《《 **Conference Program** 》》



**Day One, Sunday 25th February 2018**

**Cultural Museum / Effat Library**

- 8:00 Registration and Coffee
- 9:00 Opening Ceremony
  - National Anthem of KSA
  - Recitation of the Holy Qur'an
- 9:15 **Opening Address : Dr. Khulood Rambo**  
 Dean, College of Engineering, Effat University and L&T2018 Conference Chair

### 1st Session Technology 4.0

- 9:15 **Invited Speaker 1**  
 Dr. Abdulrahman Alahdal, Um Al Qura University, IEEE Member, KSA.  
**Title:** Biomedical Application of IoT Technologies and its Effect
- 9:35 **Invited Speaker 2**  
 Dr. Abdulrahman Shaikh, Education Solutions, Jeddah, KSA.  
**Title:** Internet of Things: The New Education and Learning Era.
- 9:55 **Invited Speaker 3**  
 Dr. Taher Albalawi, Co-Founder & Executive Manager of Geek Valley for Innovation and technology, KAS.  
**Title:** How IoT Technologies & Smart Cities will Change or Lives
- 10:15 **Discussion Panel + Awards**  
**Session Chair and Moderator:** Dr. Elham Hassanain,  
 Vice Rector for Academic Affairs, Prince Muqrin University, Madinah, KSA
- 10:55 **Coffee Break**

### 2nd Session Industry 4.0

- 11:10 **Welcome Speech**  
**Dr. Malak Alnory**, Provost, Effat University
- 11:15 **Keynote Speaker 1**  
**Dr. Habiba Alsaffar**, Head of Khalifa University's Center of Excellence in Biotechnology, UAE.  
**Title:** The uncovering of new knowledge and empowering the youth.



- 11: 45 **Keynote Speaker 2**  
**Scott Amyx**, Managing Partner at Amyx Ventures, CEO Amyx+, TEDx, Tribeca Fellow, Sloan/ Woodrow Wilson Fellow, Singularity U., EC, UN, IBM Futurist, Wiley Author.

**Title:** Saudi Arabia's Potential to be the number 1 renewable energy producer in the world.

- 12:15 **Invited Speaker 4**  
**Prof. Dr. Rainer M. Speh**, Chief Technology Officer Siemens Ltd, Riyadh, KSA.

**Title:** IoT and Digitization Towards Saudi Vision 2030

- 12:45 **Discussion Panel + Awards**  
**Session Chair and Moderator: Dr. Hamza Ghulman**,  
Dean of College of Engineering, Um Alqura University, Makkah

- 13:15 **Entertainment Session 2**

- 13:30 **Lunch & Prayer Break**

### 3rd Session Education 4.0

- 14:30 **Invited Speaker 5**  
**Ms. Suzanne Lyons**, Research Specialist, Office of Institutional Effectiveness and Title V, Norwalk Community College

**Title:** Making Individualized and Differentiated Instruction a reality

- 14:50 **Invited Speaker 6**  
**Ms. Rachael Lederman DiPietro**, Research Specialist, Office of Institutional Effectiveness and Title V, Norwalk Community College

**Title:** Higher Order Thinking Skills.

- 15:10 **Invited Speaker 7**  
**Dr. Hayssam Dahrouj**, Assistant Professor, Director Biometric and Sensor Systems Lab, Effat University, Jeddah, KSA

**Title:** Smoke Meets Cloud: Resource Allocation in the IoT Era

- 15:30 **Discussion Panel + Awards**  
**Session Chair and Moderator** Ghada Al-Dabbagh, Associate Professor, Computer Science Department, Faculty of Computing and Information Technology, Kind Abdul-Aziz University

- 16:00 **Day One Poster Competition Awards + Closing Session**  
L&T2018 Conference Rapporteur



**Day Two: Monday 26th February 2018 Effat Library and Cultural Museum**

8:00 **Registration and Coffee**

**1st Session Architecture 4.0**

9:00 **Invited Speaker 1**  
**Dr. Rudolph Alkhory**, Dean of Miami School of Architecture.

**Title:** From Smart Bricks to Smart Cities

9:35 **Invited Speaker 2**  
**Dr. Mervat Alshafie**, Effat University, KSA

**Title:** The Smart Environment of Commercial Buildings

9:55 **Invited Speaker 3**  
**Dr. Samah Alkhateeb**, Effat University, KSA

**Title:** IoT Architecture a Gateway to Smart Cities in Arab World

10:15 **Discussion Panel + Awards**  
**Session Chair and Moderator: Dr. Areej Milibari**, Associate Professor, Computer Science Department, King Abdul-Aziz University

10:55 **Coffee Break**

**2nd Session Humanity 4.0**

11:15 **Keynote Speaker 1**  
**Scott Amyx**, Managing Partner at Amyx Ventures, CEO Amyx+, TEDx, Tribeca Fellow, Sloan/ Woodrow Wilson Fellow, Singularity U., EC, UN, IBM Futurist, Wiley Author, New York, USA.  
**Title:** What is the role of human in the world of hyper automation?

11:45 **Invited Speaker 4**  
Dr. Wadee Halabi, Director of the virtual reality research center, Effat University  
**Title:** Virtual Reality in the IoT Era.

12:15 **Invited Speaker 5**  
Sajed Shamma (Cisco Territory Manager)  
**Title:** How IoT will change the way we work, learn & Live

12:45 **Discussion Panel + Awards**  
**Session Chair and Moderator: Dr. Ibrahim Albidewi**, Vice Manager of Strategic Planning Division, King Abdul-Aziz University, KSA.

13:15 **Entertainment Session 2**

13:30 **Lunch & Prayer Break**



### 3rd Session Lifestyle 4.0

- 14:30 **Invited Speaker 6**  
**Mr. Fihaid Alsubaihi**, Patent Technical Examiner, KACST, Riyadh, KSA  
**Title:** An overview for Intellectual Property Rights in Saudi Arabia.
- 15:00 **Invited Speaker 7**  
**Dr. Fahad Al-Dosari**, Dean of the College of College of Computer Science, Umm Alqura University, Makkah, KSA  
**Title:** IoT Impact on Education.
- 15:15 **Invited Speaker 8**  
**Dr. Vijey Thayanathan**, Associate Professor, King Abdul-Aziz University, Jeddah, KSA.  
**Title:** Living with IoT, a lifestyle transformation.
- 15:30 **Discussion Panel + Awards**  
**Session Chair and Moderator: Dr. Kholoud Khateeb**, Assistant Professor, Information Systems Department, Effat College of Engineering, Effat University, Jeddah, KSA
- 15:50 **Day Two Closing Session**  
L&T2018 Conference Rapporteur



**Paper Presentations Session 1**

**26th Feb 2018 (09:00 am – 11:00 am)**

| Time                | <b>DGSR Seminar Room</b><br>(Architecture 4.0 Energy 4.0)<br>Session Chair: Dr. Rania Adham   | <b>Library Seminar Room</b><br>(IoT Applications 4.0)<br>Session Chair: Dr. Mohammed Shehata   |
|---------------------|---|--|
| 09:00<br>–<br>09:15 | <b>Paper ID2-</b><br>"Design of an IoT Smart Home System", Iqbal Khan, Akram Khan, Abdullah Al-Zahrani, Safwan Al-Harbi and Soliman Al-Nashri<br>Umm Al Qura University, Makkah, KSA  | <b>Paper ID181-</b><br>"VLSI design of energy efficient computational-centric smart objects for IoT",<br>Aziza Hussein and Charles Rajesh Kumar<br>Effat University, Jeddah, KSA   |
| 09:15<br>–<br>09:30 | <b>Paper ID43-</b><br>"A Smart Home Appliances Control System Based On Digital Electronics and GSM Network", Rana Johar, Saeed Qaisar, Renad Allagani and Esraa Fakieh<br>Effat University, Jeddah, KSA   | <b>Paper ID57-</b><br>"A WiFi-based Energy Monitoring Prototype for Data Acquisition in Internet of Things", Dr. Qazi Mamoon Ashraf, Muhammad Qamarulrifin Abd Azizul, Dr. Mohd Izhan Mohd Yusoff, Wan Razli Wan Abdullah and Mohamed Razman Bin Yahya<br>Telekom Research and Development, Malaysia |
| 09:30<br>–<br>09:45 | <b>Paper ID148-</b><br>"Monitoring the Operation of a Transmission Line in a Smart Grid System through IoT",<br>Fatima Alhebshi, Heba Alnabils, Jauhra Alzebaidi, Ahmed Bensenouci and Mohamed-Amine Bensenouci<br>Effat University, Jeddah, KSA, Bab-Ezzouar University, Algeria | <b>Paper ID160-</b><br>" Blockchain for Government Services – Use Cases, Security Benefits and Challenges ",<br>Ahmed Alketbi, Qassim Nasir and Manar Abu Tailb<br>Effat University, Jeddah, KSA<br>University of Sharjah Sharjah, United Arab Emirates  |
| 09:45<br>–<br>10:00 | <b>Paper ID77-</b><br>" Security and Privacy for IoT and Fog Computing Paradigm ", Dr. Abdul Rauf, Riaz A. Shaikh and Asadullah Shah  | <b>Paper ID42-</b><br>"An ARM Based Wireless Sensors Network for Monitoring of Plants Health", Areej Sabo and Saeed Qaisar<br>Effat University, Jeddah, KSA  |
| 10:00<br>–<br>10:15 | <b>Paper ID61-</b><br>"Energy Efficient Industrial Internet of Things",<br>Mohammed Ahmed, Chandana Withana, Abeer Alsadoon, Mohsin Iftikhar and Ijaz Ali Shoukat<br>Charles Sturt University, Australia,<br>International University Faisalabad, Pakistan                        | <b>Paper ID38-</b><br>"The smart Sprinkling System",<br>Rana Johar, Ahmed Bensenouci and Mohamed-Amine Bensenouci<br>Effat University, Jeddah, KSA   |
| 10:15<br>–<br>10:30 | <b>Paper ID91-</b><br>"Renewable Energy as a Sustainable Resource for Internet of Things (IoT) in Smart Cities", Maha Tony<br>Minoufia University, Faculty of Engineering, Egypt  | <b>Paper ID177-</b><br>"Factory Automation and Irrigation Control Systems in an IoT Environment", Kamel Ammour<br>Jeddah University, Jeddah, KSA   |
| 10:30<br>–<br>10:45 | <b>Paper ID101-</b><br>"Energy Efficient IoT Home Monitoring And Automation System", Raneen Alzafarani and Ghadi Alayaya<br>King Abdulaziz University, Jeddah, KSA  | <b>Paper ID176-</b><br>"Dual pH Level Monitoring and Control using IoT Application", Asma Fatani, Afnan Kanawi, Hedaih S. Alshami, Ahmed Bensenouci and Mohamed-Amine Bensenouci<br>Jeddah University, Jeddah, KSA   |
| 10:45<br>–<br>11:00 | <b>Paper ID–123</b><br>"Can the IoT Enhance the Conservation of Energy in Saudi Communities?", Mohammed Al Surf<br>Effat University, Jeddah, KSA  | <b>Paper ID28-</b><br>"Developing Intercultural Competencies through Virtual Reality-Implications for Internet of Things Applications in Education and Learning", Mesut Akdere and Louis Hickman<br>Purdue University, USA   |

**Paper Presentations Session 2**

**26th Feb 2018 (14:30 pm – 15:45 pm)**

| <b>Time</b>         | <b>DGSR Seminar Room<br/>(IoT Security and Health)<br/>Session Chair: Dr. Rania Adham</b>   | <b>Library SeminarRoom<br/>(Humanity 4.0 – Education 4.0)<br/>Session Chair: Ms. Mueen Uddin</b>   |
|---------------------|---|--|
| 10:45<br>–<br>11:00 | <p><b>Paper ID96-</b><br/>"A novel and Secure Smart Parking Management System (SPMS) based on Integration of WSN, RFID, and IoT",<br/>*Omar Abdulkader, *Vijey Thayanathan, *Kamal Jambi, Alwi **Bamhdi and ***Muasaad Alrasheedi<br/>*King Abdulaziz University; **Jazan University; *** Arab Open University, KSA</p> | <p><b>Paper ID74-</b><br/>"Development of IoT Mining Machine for Twitter Sentiment Analysis: Mining in the Cloud and Results on the Mirror", Salha Alzahrani<br/>Taif University, Taif, KSA</p>                          |
| 14:30<br>–<br>14:45 | <p><b>Paper ID54-</b><br/>" Estimating Data Traffic (EDT) through Software-Defined Multiple Access for IoT Applications over 5G Networks", Dr. Ahmed Alshafut and Dr. Vijey Thayanathan<br/>King Abdulaziz University</p>   | <p><b>Paper ID64-</b><br/>" N-shopping: New online shopping process for NEOM", Dr. Samiha Brahimi and Asiya Abdus Salam Qureshi<br/>Imam Abdulrahman Bin Faisal University</p>   |
| 14:45<br>–<br>15:00 | <p><b>Paper ID5-</b><br/>"Internet of Medical Things: Architectural Model, Motivational Factors and Impediments", Mohammed Irfan and Naim Ahmad<br/>King Khalid University, Riyadh, KSA</p>   | <p><b>Paper ID79-</b><br/>"Promises and Challenges of ICT in Education", Muhammad Safdar, Gulifan Ali Safdar, Muhammad Abdul Malik and Shaikh Kamran Masood<br/>International Islamic University Islamabad, Pakistan</p> |
| 15:00<br>–<br>15:15 | <p><b>Paper ID132-</b><br/>"IoT Based Assistive Walker Device for Frail &amp; Visually Impaired People", Makarem Aljahdali, Ahmed Bensenouci, Raghad Abokhamees and *Mohamed-Amine Bensenouci<br/>Effat University, Jeddah, KSA</p>   | <p><b>Paper ID6-</b><br/>"The Impact of Social Networking Sites on Employees' Performance", Amani Maturi<br/>King Abdulaziz University, Jeddah, KSA</p>  |
| 15:15<br>–<br>15:30 | <p><b>Paper ID34-</b><br/>"IoT based Mobile Healthcare System for Human Activity Recognition", Abdulhamit Subasi, Mariam Radhwan, Rabea Kurdi and Kholoud Khateeb<br/>Effat University, Jeddah, KSA</p>   | <p><b>Paper ID131-</b><br/>"Framework for Real-time Crowd Management and Analytics using FOG computing", Muhammad Ali Ismail<br/>NED University of Engineering and Technology, Pakistan</p>                              |
| 15:30<br>–<br>15:45 | <p><b>Paper ID36-</b><br/>" Traffic Accident Detection Using Random Forest Classifier ", Dr. *Nejdet Dogru and **Abdulhamit Subasi<br/>* International Burch University<br/>**Effat University, Jeddah, KSA</p>   | <p><b>Paper ID7-</b><br/>" Connected solid-state lighting, the way for the IoT Revolution " Omar A. Kittaneh, Mohammed Abdul Majid, Mohamed Shehata<br/>Effat University, Jeddah, KSA</p>                                |



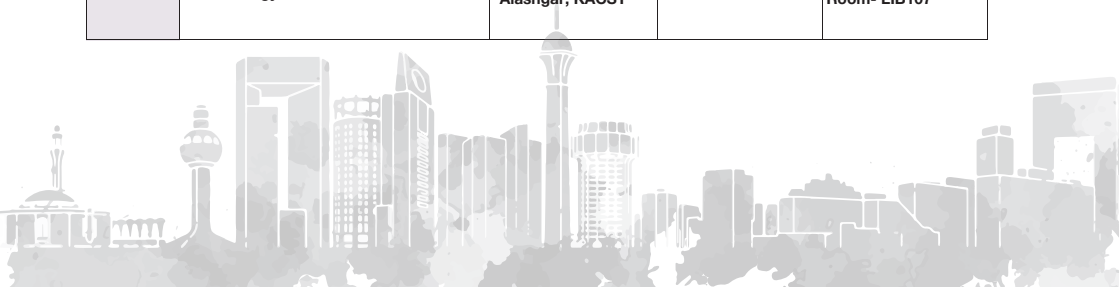
## Workshops Sessions:

### Day One: Sunday 25th February 2018

| No. | Title  | Presenter                                       | Time              | Venue                         |
|-----|--|---|-------------------|-------------------------------|
| 1   | Introduction to Blended learning technology<br>Hands on Blended learning tools | Dr. Rabea Ramadhan, IEEE, KSA                   | 09:00am – 11:00am | Library Seminar Room- LIB107  |
| 2   | Internet-of-Things in Telemedicine for Diabetes Management                     | Dr. Salem Alelyani, King Khaled University, KSA | 09:00am – 11:00am | Library Seminar Room- LIB107  |
| 3   | Web Applications Hacking: SQL Injection & Cross-Site Scripting                 | Dr. Mousa Al-Akhras, IEEE, KSA                  | 14:00pm – 18:00pm | Library Training Room- LIB106 |

### Day Two: Monday 26th February 2018

| No. | Title  | Presenter                                   | Time              | Venue                          |
|-----|--|---|-------------------|--------------------------------|
| 1   | Bluetooth Beacons in Factories, IoT and Industry 4.0                                     | Dr Abdulrahman Shikh, Education E-Solutions | 09:00am – 11:00am | Library Training Room - LIB106 |
| 2   | How To Write a Patent Proposal?  | Mr. Fuhaid Alsubaiai, KACST                 | 09:00am – 11:00am | Library Seminar Room- LIB107   |
| 3   | Building a Model For Distance Monitoring Status and Controlling Throw Mobile Application | Zeinab Iqal, University of Jeddah, KSA      | 14:00pm – 16:00pm | Library Training Room- LIB106  |
| 4   | How to Search for the Previous Technology?   | Mr. Khaled Alashgar, KACST                  | 14:00pm – 16:00pm | Library Seminar Room- LIB107   |





**EMBEDDING INTELLIGENCE**  
L&T 2018

«**Abstract**»



## Speeches' Abstracts

**Dr. Abdulrahman Alahdal**

### **Biomedical Application of IoT Technologies and its Effect**

**Abstract:**The Internet-of-Things (IoT) opens great opportunities using sensing capabilities to collect data, processing for extracting useful information that help make sensible predictions, connectivity for communicating information. It may even learn how to make critical decision for us. One of the most important fields of IoT applications is related to monitoring human body! Currently, halt monitors are used to monitor hear rates for some cardiac patients for a short period. IoT may do the same but 24 hours a day 365 days a year. Actually, it may monitor patients vital signs 24/7 at home or work very much with the same accuracy as if he/she is in hospital ward or even ICU.

**Prof. Dr. Rainer M. Speh**

### **IoT and Digitization towards Saudi Vision 2030**

**Abstract:**Digitalization is one if not the most important key topic within Saudi Vision 2030 to transform the Kingdom and to establish new industries beyond oil & gas as well as petrochemicals. The Internet of Things (IoT) is seen not as a current hype but as the main driving force from the technical perspective. However, IoT has so many aspects and sometimes is discussed in single applications but not systematically and not as a system-wide solution. The presentation will start with a short introduction of the recent IoT technologies and trends. Afterwards, several objectives of Saudi Vision 2030 will be mapped on a possible and feasible landscape, which can be supported by digitalization namely the Internet of Things. MindSphere, the Industrial IoT Platform is part of the overall system architecture of Siemens and will be presented first. The digital twin concept based on the Industrie 4.0 Approach and presented afterwards and will play a major role in implementing solutions For existing and new industries, smart cities like NEOM and comprehensive mobility Solution.

**Dr. Habiba Alsaffar**

### **The uncovering of new knowledge and empowering the youth**

**Abstract:**Although the "glass ceiling" is a term often used to represent barriers to women, it can be used as a source of motivation for women to overcome challenges. Consequently, it is not surprising that women are often recognized for their multi-tasking ability. As a faculty member in an institution with contemporary values, opportunities are abundant. It is an exciting time, if one chooses to cultivate one's innate abilities. In concert with our instinctive nature to nurture, teach and support, a career in academia is a very fulfilling vocation. The challenges of pursuing independent thought, the rewards of mentorship, and the responsibility as an administrator all intersect, each providing its own reward.

My journey to academia was inspired and supported by a family that took me to 3 continents in pursuit of knowledge. My enjoyment for teaching and mentorship comes from my passion to develop the youth of my country. I keep learning new ways of delivering material in novel ways, embracing technology. I am also privileged to be given the opportunity to lead a research team dedicated to understanding the origins of the Arabian people and genetic factors that predispose us to disease at the UAE's premier university.



## Speeches' Abstracts

**Scott Amyx**

### **Saudi Arabia's Potential to be the number 1 renewable energy producer in the world**

**Abstract:** In this presentation, Scott Amyx lays out a bold actionable plan with key goals & objectives, deliverables and dates to kick into high gear a vibrant renewable energy sector for Saudi Arabia. Saudi women are central to the creation of a powerful and sustainable renewable energy ecosystem that will ensure KSA's economic prosperity for centuries to come. Specifically, Mr. Amyx will explore multi-billion dollar opportunities ripe for commercialization in solar, advanced commercial batteries, next generation nuclear power reactors, smart cities, smart ports, smart transportation, smart logistics and supply chain. Exponential technologies such as intelligent AI systems, the Internet of Things, robotics, blockchain, cryptocurrency, graphene, wireless energy harvesting, quantum computing and other disruptive technologies will fundamentally reshape the industries of the future. KSA has the potential to leapfrog existing global competitors in the renewable energy with the right mix of strategy, capital, R&D, innovation, talent development, applications and test beds. In order to pivot KSA's massive oil & gas industry to renewable energy, we will need the full participation of the labor force. Highly educated Saudi women is critical to the overall success of KSA's transformation into a renewable energy powerhouse even ICU.

**Rachael Lederman DiPietro**

### **Using Data & Technology to Drive Student Success – Part 2**

**Abstract:** This presentation will address how one American community college is leveraging data and technology to improve student and institutional performance. Participants will be given an overview of the community college system, including the challenges and barriers faced by its students, faculty and staff. Presenters will discuss how they are reflectively navigating systems-level change while trying to keep pace with a technology-rich generation of students. They will also share data-driven, collaborative strategies to impact student success along with considerations for future implementation.

**Ms. Suzanne Lyons**

### **Using Data & Technology to Drive Student Success – Part 1**

**Abstract:** This presentation will address how one American community college is leveraging data and technology to improve student and institutional performance. Participants will be given an overview of the community college system, including the challenges and barriers faced by its students, faculty and staff. Presenters will discuss how they are reflectively navigating systems-level change while trying to keep pace with a technology-rich generation of students. They will also share data-driven, collaborative strategies to impact student success along with considerations for future implementation.



## Speeches' Abstracts

**Dr. Abdulrahman Shaikh**

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## Speeches' Abstracts

**Dr. Rudolph Alkhory**

### From Smart Bricks to Smart Cities.

**Abstract:**The internet and the web have opened an entire new world that is accessible mainly through the screens of dedicated devices. Imagine this world integrated into the built environment and engaged directly with all the senses. This is the world that we are prototyping one object at a time at the University of Miami School of Architecture. A world of objects that communicate, respond, and smartly react to your presence and your needs. The presentation surveys the work of RAD-UM, a research at U-SoA dedicated to embedded technology, from responsive household objects and connected buildings to a smart city designed from the ground up in Mexico's Yucatan Province.

**Scott Amyx**

### What is the role of human in the world of hyper automation?

**Abstract:**What is the Role of Humans in the World of Hyper-Automation?

AI-driven cyber-physical automation is expected to displace 50% (average OECD nations) to 80% (less developed nations) of the human workforce by 2030. As the pace of convergence of exponential technologies reach near vertical slope, the trend of human displacement is unstoppable. What will be the role of humans?

For the structurally unemployed and underemployed, it will be bleak future with limited options. Only those with highly specialized PhDs in fields that create, train and maintain AI, robotic and advanced scientific and technical systems may have a place in the world of hyper-automation. Contrary to popular belief that only predictable physical work is automatable (McKinsey), as narrow AI continues to master new niches, it will amass a superset of capabilities that will not only replace tasks but holistic job functions. There is no senior executive, policymaker or subject matter expert that will be safe.

Scott Amyx explores the limitations of universal basic income and taxing robots. Instead, he proposes a vastly different, out-of-the-box solution called the Human Currency. It's a global economy and a cryptocurrency based on human-to-human empathy services. Moreover, it has the resiliency and sustainability built into the system to ensure the viability of the human race for centuries to come.

**Mohammed Irfan and Naim Ahmad**

### Internet of Medical Things: Architectural Model, Motivational Factors and Impediments

**Abstract:** The field of Internet of Things (IoT) is progressing in a fashion that will transform the complete landscape of future internet. It will further provide opportunities into new domains for automation and integration of real word objects. Medical field is always at the forefront of innovation adoption. There are currently numerous applications of the concept in the medical field such as e-Health and m-Health. This paper has reviewed and proposed the architectural model to implement Internet of Medical Things (IoMT). Moreover using Carley's eight step content analysis technique, motivational factors for the adoption of IoMT have been identified. Finally the paper sheds light on the major impediment such as security and privacy issues. This work will help the medical professionals to smoothly integrate the IoMT in their domain and avoid the major pitfalls.

## Speeches' Abstracts

**Iqbal Khan, Akram Khan, Abdullah Al-Zahrani, Safwan Al-Harbi and Soliman Al-Nashri**

### **Design of an IoT Smart Home System**

**Abstract:** This paper basically deals with design of an IoT Smart Home System (IoTSHS) which can provide the remote control to smart home through mobile, infrared (IR) remote control as well as with PC/Laptop. The controller used to design the IoTSHS is WiFi based. The designed IoTSHS is controlled through remote control which uses IR and WiFi. The IoTSHS is capable to connect to WiFi and have a web browser regardless of what kind of operating system it uses, to control the appliances. No application program is needed to purchase, download, or install. In WiFi controlling, the IoTSHS will give a secured Access Point (AP) with a particular service set identifier (SSID). The user will connect the device (e.g. mobile-phone or Laptop/PC) to this SSID with providing the password and then will open the browser and go to particular fixed link. This link will open an HTML web page which will allow the user to interface between the Mobile-Phone/Laptop/PC and the appliances. In addition, the IoTSHS may connect to the home router so that the user can control the appliances with keeping connection with home router. The proposed IoTSHS was designed, programmed, fabricated and tested with excellent results. microcontroller. Temperature sensor is provided to indicate the room temperature and tell the user if it's needed to turn the AC ON or OFF. The designed IoTSHS need to be interfaced through switches or relays with the items under control through the power distribution box. When a signal is sent from IoTSHS, then the switches will connect or disconnect the item under control. The designed IoT smart home system can also provide remote controlling for the people who cannot use smart phone to control their appliances. Thus, the designed IoTSHS can benefit the whole parts in the society by providing advanced remote controlling for the smart home.

**Mohammed Irfan and Naim Ahmad**

### **Internet of Medical Things: Architectural Model, Motivational Factors and Impediments**

**Abstract:** The field of Internet of Things (IoT) is progressing in a fashion that will transform the complete landscape of future internet. It will further provide opportunities into new domains for automation and integration of real world objects. Medical field is always at the forefront of innovation adoption. There are currently numerous applications of the concept in the medical field such as e-Health and m-Health. This paper has reviewed and proposed the architectural model to implement Internet of Medical Things (IoMT). Moreover using Carley's eight step content analysis technique, motivational factors for the adoption of IoMT have been identified. Finally the paper sheds light on the major impediment such as security and privacy issues. This work will help the medical professionals to smoothly integrate the IoMT in their domain and avoid the major pitfalls.

**Amani Maturi**

### **Omar A. Kittaneh, Mohammed Abdul Majid and Mohamed Shehata**

**Abstract:** Beyond energy saving, LED connected lighting systems allows for real-time data streaming, generating intelligence and creation of intelligent buildings systems. Lifetime experiments is crucial for such a connected system, as early termination would lead to big errors in estimating the lifetime model parameters, and late termination would waste time and cost. In this paper sup-entropy is applied in quantifying the amount of information in censored solid state lighting (SSL) luminaire experimental data that has Weibull distribution with respect to complete data. We use a quantity called efficiency of the censored sample as an indicator of the quality and goodness of the censoring scheme. This allowed us to determine the suitable termination time of the experiment subject to a desired efficiency. An intensive simulation study is conducted to validate our procedure.

## Speeches' Abstracts

**Iqbal Khan, Akram Khan, Abdullah Al-Zahrani, Safwan Al-Harbi and Soliman Al-Nashri**

### **Design of an IoT Smart Home System**

**Abstract:** This paper basically deals with design of an IoT Smart Home System (IoTSHS) which can provide the remote control to smart home through mobile, infrared (IR) remote control as well as with PC/Laptop. The controller used to design the IoTSHS is WiFi based. The designed IoTSHS is controlled through remote control which uses IR and WiFi. The IoTSHS is capable to connect to WiFi and have a web browser regardless to what kind of operating system it uses, to control the appliances. No application program is needed to purchase, download, or install. In WiFi controlling, the IoTSHS will give a secured Access Point (AP) with a particular service set identifier (SSID). The user will connect the device (e.g. mobile-phone or Laptop/PC) to this SSID with providing the password and then will open the browser and go to particular fixed link. This link will open an HTML web page which will allow the user to interface between the Mobile-Phone/Laptop/PC and the appliances. In addition, the IoTSHS may connect to the home router so that the user can control the appliances with keeping connection with home router. The proposed IoTSHS was designed, programmed, fabricated and tested with excellent results. microcontroller. Temperature sensor is provided to indicate the room temperature and tell the user if it's needed to turn the AC ON or OFF. The designed IoTSHS need to be interfaced through switches or relays with the items under control through the power distribution box. When a signal is sent from IoTSHS, then the switches will connect or disconnect the item under control. The designed IoT smart home system can also provide remote controlling for the people who cannot use smart phone to control their appliances. Thus, the designed IoTSHS can benefit the whole parts in the society by providing advanced remote controlling for the smart home.

**Mohammed Irfan and Naim Ahmad**

### **Internet of Medical Things: Architectural Model, Motivational Factors and Impediments**

**Abstract:** The field of Internet of Things (IoT) is progressing in a fashion that will transform the complete landscape of future internet. It will further provide opportunities into new domains for automation and integration of real world objects. Medical field is always at the forefront of innovation adoption. There are currently numerous applications of the concept in the medical field such as e-Health and m-Health. This paper has reviewed and proposed the architectural model to implement Internet of Medical Things (IoMT). Moreover using Carley's eight step content analysis technique, motivational factors for the adoption of IoMT have been identified. Finally the paper sheds light on the major impediment such as security and privacy issues. This work will help the medical professionals to smoothly integrate the IoMT in their domain and avoid the major pitfalls.

**Amani Maturi**

### **Omar A. Kittaneh, Mohammed Abdul Majid and Mohamed Shehata**

**Abstract:** Beyond energy saving, LED connected lighting systems allows for real-time data streaming, generating intelligence and creation of intelligent buildings systems. Lifetime experiments is crucial for such a connected system, as early termination would lead to big errors in estimating the lifetime model parameters, and late termination would waste time and cost. In this paper sup-entropy is applied in quantifying the amount of information in censored solid state lighting (SSL) luminaire experimental data that has Weibull distribution with respect to complete data. We use a quantity called efficiency of the censored sample as an indicator of the quality and goodness of the censoring scheme. This allowed us to determine the suitable termination time of the experiment subject to a desired efficiency. An intensive simulation study is conducted to validate our procedure.

## Speeches' Abstracts

### Wafa Ghonaim

#### A Smart Class Hyperlearning and Management Suite

**Abstract:**The digital era of IoT, Distributed AI, mobile apps, and cloud computing is witnessing a big leap that is transforming our lifestyle into smart culture. Smart learning and knowledge management is just an instance. This work utilizes smart virtual existence by introducing a visionary Smart-Class hyperlearning suite. The Smart-Class exploits IoT, wireless sensors, multiagent systems, AI, and contemporary technologies of distant and online learning to empower a smart multiform hyperlearning paradigm, while encouraging physical attendance and learning using smart incentive schemes. The Smart-Class facilitates, also, geo-tracking, ecofriendly energy conservation, and holistic session management of multiform learning. Features are planned to be developed and implemented incrementally. A team of undergrads are active in developing the features while designing an integration layer with the school student affairs system. The Smart-Class hyperlearning paradigm would deliver an effective modern learning experience.

### Salem Alelyani and Abdelrahman Ibrahim

#### Internet-of-Things in Telemedicine for Diabetes Management (Workshop Session)

**Abstract:**Internet-of-Things (IoT) is a model for interconnected devices with tracking, sensing, processing and analyzing capabilities. IoT became a very attractive research area due to the aforementioned features beside the business opportunities. In this paper, we design a telemedicine platform for diabetes control and management. This platform aims to help diabetic patients to record and monitor their diabetes and vital signs. Besides that, the platform gives a feedback and notifications to the patient to help control and mitigate diabetes complications. In addition, the patients physician have a monitoring and communication dashboard that allows him or her to monitor the patients and communicate with them if necessary.

### Abdulhamit Subasi, Mariam Radhwan, Rabea Kurdi and Kholoud Khateeb

#### IoT based Mobile Healthcare System for Human Activity Recognition

**Abstract:** Developments in information and communication technologies have led to the wider usage of Internet of Things (IoT). In the modern health care applications, the usage of IoT technologies brings physicians and patients together for automated and intelligent daily activity monitoring for elderly people. Mobile devices and wearable body sensors are gradually implemented for the monitoring of personal health care and wellbeing. One of the main technologies of IoT improvements in healthcare monitoring system is the wearable sensor technology. Furthermore, integration of IoT in healthcare has led to initiate smart applications such as mobile healthcare (m-Healthcare) and intelligent healthcare monitoring systems. In this study an intelligent m-healthcare system based on IoT technology is presented to provide pervasive human activity recognition by using data mining techniques. In this paper, we present a user-dependent data mining approach for off-line human activity classification and a robust and precise human activity recognition model is developed based on IoT technology. The proposed model utilizes the dataset contains body motion and vital signs recordings for ten volunteers of diverse profile while performing 12 physical activities for human activity recognition purpose. Results show that the proposed system is superior in performance with 99.89 % accuracy and is highly effective, robust and reliable in delivering m-Healthcare services during different activities.

## Speeches' Abstracts

\*Nejdet Dogru and \*\*Abdulhamit Subasi

### Traffic Accident Detection Using Random Forest Classifier

**Abstract:** The Internet of Things (IoT) has been growing in recent years with the improvements in several different applications in the military, marine, intelligent transportation, smart health, smart grid, smart home and smart city domains. Although IoT brings significant advantages over traditional information and communication (ICT) technologies for Intelligent Transportation Systems (ITS), these applications are still very rare. Although there is a continuous improvement in road and vehicle safety, as well as improvements in IoT, the road traffic accidents have been increasing over the last decades. Therefore, it is necessary to find an effective way to reduce the frequency and severity of traffic accidents. Hence, this paper presents an intelligent traffic accident detection system in which vehicles exchange their microscopic vehicle variables with each other. The proposed system uses simulated data collected from vehicular ad-hoc networks (VANETs) based on the speeds and coordinates of the vehicles and then, it sends traffic alerts to the drivers. Furthermore, it shows how machine learning methods can be exploited to detect accidents on freeways in ITS. It is shown that if position and velocity values of every vehicle are given, vehicles' behavior could be analyzed and accidents can be detected easily. Supervised machine learning algorithms such as Artificial Neural Networks (ANN), Support Vector Machine (SVM), and Random Forests (RF) are implemented on traffic data to develop a model to distinguish accident cases from normal cases. The performance of RF algorithm, in terms of its accuracy, was found superior to ANN and SVM algorithms. RF algorithm has showed better performance with 91.56% accuracy than SVM with 88.71% and ANN with 90.02% accuracy.

Rana Johar, Ahmed Bensenouci and Mohamed-Amine Bensenouci  
The smart sprinkling system

**Abstract:** One of the main problems facing modern cities is water scarcity. The increasing level of water wastage in the irrigation system is an alarming problem. According to the 2030 vision, a reduction in water wastage is sought. Moreover, in this era home appliances using the Internet of Things (IoT) applications is highly needed for efficiency purposes. This represents a strong motivation to create a simple device to achieve water efficiency. Home sprinkler water flow systems do not take into consideration the current state of the surroundings, which lead to high wastage of water. In this research paper, a conceptual smart traveling sprinkler composed of a water pump and a motion motor is proposed. The suggested circuit design includes sensors that are capable of detecting soil conditions, such as moisture level and object proximity. The device power is provided by a solar panel that is connected to the water tank, which incorporates a level indicator. The method of control and the monitoring through a mobile phone is used to enter the field size, duration etc. A series of pushbuttons and LCDs can also be integrated. The desired objective is the reduction of water consumption, and this brings us one step closer to achieving the 2030 vision



## Speeches' Abstracts

**Lama Jamjoom, Saeed Qaisar and Azzah Alshmaran**

### **A Wireless Controlled Digital Car Lock For Smart Transportation: Demonstrator For Education**

**Abstract:**In current era the Internet of Things (IoT) is becoming an important part of our daily life. It is employed in a variety of applications like smart buildings, intelligent transport systems, smart grid, etc. The aim of this project is to contribute to the evolution of Internet of Things (IoT) application in intelligent transportation systems. The focus is to develop a smartphone based wireless controlled car lock demonstrator for education. Indeed, the recent technological evolution has revolutionized the use of smartphones in our lives. The idea is to allow a group of authorized people to share a lot of cars. Whenever an authorized person requires a car, a request is firstly submitted via internet to a server based utility. On the availability of a car the request is granted and vice versa. In the case of an authorization, a digital code is sent to the smartphone of the person who has originated the car request. In order to convey the digital code, received on the smartphone, to the front end embedded controller a customized Android-based application is devised. It is developed by using the MIT inventor app. This application is installed on the smartphone and it is linked to the front-end embedded controller based digital car lock via the Bluetooth interface. The intended code, to lock or unlock the car, is sent by the concerned person by using this application. The command is transmitted to the front-end embedded controller via the Bluetooth port. After a recognition, the received command is executed by the front-end module and a flag is returned to the smartphone-based soft application. The concerned car status with time and date is also recorded in the application platform and is updated on the cloud. It allows to access this information globally and at any time with a passcode. A system prototype is implemented and tested. Experimental results have confirmed a proper system operation.

**Areej Sabo and Saeed Qaisar**

### **An ARM Based Wireless Sensors Network for Monitoring of Plants Health**

**Abstract:**In current era, with the latest technological developments, the Internet of Things (IoT) is becoming an important part of our daily life. The aim of this project is to use the IoT with an intelligent wireless sensors network in order to monitor the health of plants and to observe the population of larva in a remote crop field. In this framework, a wireless sensors network is proposed to detect larva and measure other system parameters like Acoustic Complexity Index (ACI), temperature, humidity and soil moisture. The sensors' data is collected by the front end sensing node, developed with a STM32F407VG board, via a serial port. The STM32F407VG board is based on the ARM processor. The data from the node is transmitted to a base station by using a wireless ZigBee interface. The base station collects data from a group of sensor nodes. This data is transmitted to the Central Processing Unit (CPU) via the USB liaison between the base station and the CPU. On CPU this data is analyzed via the MATLAB based specifically developed application. The findings are displayed and stored on the CPU and are also logged on the cloud via Thingspeak liaison. It allows accessing this data globally at any time. It is done to realize a timely interaction and cure of the intended crop field. The system parameters are adjusted in order to achieve the effective modules integration and performance. The proposed system operation is tested with an experimental setup. Results have confirmed a proper system functionality.



## Speeches' Abstracts

**Rana Johar, Saeed Qaisar, Renad Allagani and Esraa Fakieh**

### **A Smart Home Appliances Control System Based On Digital Electronics and GSM Network**

**Abstract:** In current era, the Internet of Things (IoT) is becoming an important part of our daily life. It is employed in a variety of applications like smart cities, intelligent transportation, smart grid, wearables, etc. The aim of this project is to contribute to the evolution of Internet of Things (IoT) application in smart homes. It uses DTMF (Dual Tone – Multi-Frequency) connection to control the home appliances remotely via a GSM network. It overcomes the confines of conventional wall switches, have to be functioned physically. The idea is to employ a DTMF decoder through which home appliances can be controlled by dialing a predefined number, via smart phone, for a specific load. It allows to operate the system globally via cellular phone. The system receives commands from a smartphone, decode it via a DTMF decoder and generates a digital output which passes through a CMOS based active low decoder and Flip Flops to activate or deactivate an intended load in the home. The load activation and deactivation activities are also logged on the cloud. It is done by observing the Flip Flops status via a front-end controller and passing this information to the server via a Bluetooth liaison. The server then updates the system status on the cloud via the Thingspeak liaison. The front-end electronics Truth Table and logic diagrams are presented. The system modules are modeled with Multisim and MATLAB. The simulation results have shown a proper system operation.

**Ahmed Alshafut and Dr Vijey Thayanathan**

### **Estimating Data Traffic (EDT) through Software-Defined Multiple Access for IoT Applications over 5G Networks**

**Abstract:** Wireless Connections and volume of the traffic are increasing with different applications over 5G environments. Thus, many researchers have estimated the increasing range of user's requirements within these networks. However, the traffic management will play a very important role in satisfying the user's needs in future wireless communications. In this research, the massive data traffic will be studied for enabling the best of IoT applications over a 5G network. Thus, the multiple accessing schemas are presented for managing the overall network traffic. Furthermore, the primary aim of this research is to provide an efficient estimation technique for managing traffic when multiple access is capable of handling variable delays and data priorities associated with the large volume of the traffic considered in the 5G networks. Thus, it can be modified to IoT applications within future IoT based 5G networks. Moreover, this research will be leading us to implement an estimated traffic solution for IoT applications over 5G networks. Thus, it comprehensively focuses on the traffic issues within large applications from the accessing steps till assuring the service delivery.

**Nafisa Ahmed, Manar Abu Talib and Qassim Nasir**

### **Program-Flow Attestation of the IoT Systems Software**

**Abstract:** Remote attestation is the process of measuring the integrity of a device over the network, by detecting modification of software or hardware from the original configuration. Several remote software-based attestation mechanisms have been introduced, that rely on strict time constraints and other impractical constraints that make them inconvenient for IoT systems. Although some research is done to address these issues, they integrated trusted hardware devices to the attested devices to accomplish their aim, which is costly and not convenient for many use cases. In this paper, we propose "Dual Attestation" that includes two stages: static and dynamic. The static attestation phase checks the memory of the attested device. The dynamic attestation technique checks the execution correctness of the application code and can detect the runtime attacks. The objectives are to minimize the overhead and detect these attacks, by developing an optimized dynamic technique that checks the application program flow. The optimization will be done in the prover and the verifier sides.

## Speeches' Abstracts

**Dr. Qazi Mamoon Ashraf, Muhammad Qamarulrifin Abd Azizzul, Dr. Mohd Izhan Mohd Yusoff, Wan Razli Wan Abdullah and Mohamed Razman Bin Yahya**

### **A WiFi-based Energy Monitoring Prototype for Data Acquisition in Internet of Things**

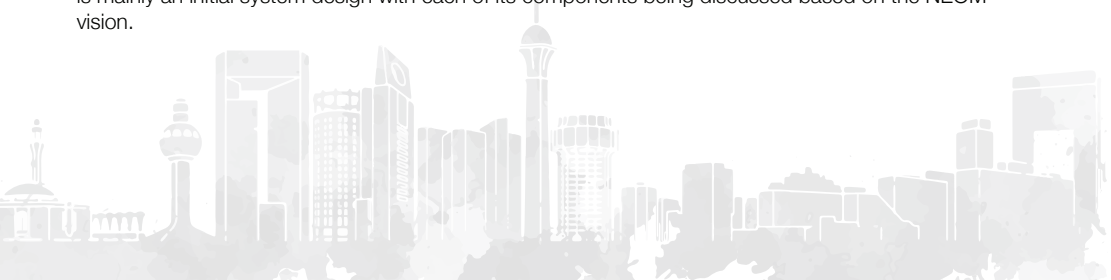
**Abstract:** Energy monitoring is one of the important applications arising from research in Internet of Things (IoT) as well as the Smart Grid. Smart meters form an important element in energy monitoring systems and they provide insight into total energy consumption of a smart household. In this work, a WiFi-based energy monitoring prototype is developed to assist in obtaining periodic updates of energy data consumed by the smart household. Wi-Fi was selected as the technology of choice due to high availability in homes. Experiment was setup such that simultaneous measurement from both ELIVE and Billion sensors. To analyze the observed cumulative distribution function for the measured variables with a theoretical distribution. This work employed statistical Kolmogorov-Smirnov procedure. Based on the summary statistics, the prototype ELIVE performed better than an off-the-shelf device which was used as a benchmark. Statistical techniques and results are presented in this paper which were obtained after analysis of energy data and statistical comparison between the proposed prototype and the benchmark.

**Mohammed Ahmed, Chandana Withana, Abeer Alsadoon, Mohsin Iftikhar and Ijaz Ali Shouka**  
**Energy Efficient Industrial Internet of Things**

**Abstract:** WSN based IoT devices are being deployed in industry widely. But the IIoT devices have limited energy resources as they operate on the basis of limited battery life. Many techniques and algorithm such as Green IoT has been proposed in literature but still their effectiveness has not been established. The limited energy resources of IIoT affect the overall performance of the industrial setup. The frequent change of battery is not possible in industrial setup. Therefore, there is strong need of energy efficient IIoT. After a comprehensive literature review, the currently available energy efficient IIoT framework has been identified. The current framework is analyzed for any kind of limitations/issues and a hybrid solution is proposed to handle the limitations of the current best solution. The proposed solution is simulated and has been compared with current state of the art techniques. The proposed solution outperforms the current state of the art techniques.

**Samiha Brahimi and Asiya Abdus Salam Quresh**  
**N-shopping: New online shopping process for NEOM**

**Abstract:** A new way of living leads to new and advanced developmental area of innovation. In this paper, an online shopping system design for NEOM megacity project is proposed. The system is based on the use of self-regulating vans and middle stores. Self-regulating vans are employed for delivering the customer orders from different stores passing by the middle stores that appear as common intersecting points. The advantage of doing so is to speed up the delivery process by assigning the customer order to more than one van following the concept of relay race tracking. The relative issues to be addressed here is mainly an initial system design with each of its components being discussed based on the NEOM vision.



## Speeches' Abstracts

**Salha Alzahrani**

### **Development of IoT Mining Machine for Twitter Sentiment Analysis: Mining in the Cloud and Results on the Mirror**

**Abstract:** Microblogs sentiment analysis of people's attitudes, appraisals and emotions has become one of the most active research areas for business marketing, decision making, political campaigns, and alike. As people publish short snippets of texts through the social networks expressing their ideas, thoughts and opinions, an instant and reliable mining machine should be utilized. In this paper, we proposed an IoT mining machine for Twitter sentiment analysis. Firstly, we used Twitter's API for harvesting tweets in real time. Then, a mining engine was developed on the Raspberry Pi single-board microcomputer as an IoT platform due to its availability and connectivity. The IoT device was programmed for sentiment analysis and opinion mining using state-of-the-art Naive Bayes classifier which after training was used to classify the trending tweets into either positive or negative. We used a gold standard dataset from SemEval 2017 for training our classifier which achieved 0.992 of accuracy. We aggregated the sentiments of tweets streamed in daily trend hashtags into visualized graphs. Finally, the visualized results from opinion mining were displayed on two-way smart mirror without any need for application installation. Our experimental results on the IoT mining machine demonstrate its feasibility and effectiveness.

**Abdul Rauf, Riaz A. Shaikh and Asadullah Shah**

### **Security and privacy for IoT and Fog Computing Paradigm**

**Abstract:** In the past decade, the revolution in miniaturization (microprocessors, batteries, cameras etc.) and manufacturing of new type of sensors resulted in a new regime of applications based on smart objects called IoT. Majority of such applications or services are to ease human life and/or to setup efficient processes in automated environments. However, this convenience is coming up with new challenges related to data security and human privacy. The objects in IoT are resource constrained devices and cannot implement a fool-proof security framework. These end devices work like eyes and ears to interact with the physical world and collect data for analytics to make expedient decisions. The storage and analysis of the collected data is done remotely using cloud computing. The transfer of data from IoT to the computing clouds can introduce privacy issues and network delays. Some applications need a real-time decision and cannot tolerate the delays and jitters in the network. Here, edge computing or fog computing plays its role to settle down the mentioned issues by providing cloud-like facilities near the end devices. In this paper, we discuss IoT, fog computing, the relationship between IoT and fog computing, their security issues and solutions by different researchers. We summarize attack surface related to each layer of this paradigm which will help to propose new security solutions to escalate its acceptability among end users. We also propose a risk-based trust management model for smart healthcare environment to cope with security and privacy-related issues in this highly un-predictable heterogeneous ecosystem.



## Speeches' Abstracts

### Muhammad Safdar, Gulfam Ali Safdar, Muhammad Abdul Malik and Shaikh Kamran Masood Promises and Challenges of IOT in Education

**Abstract:** Internet of Things (IoT) in education is a hot topic and is getting ever increasing popularity over the globe because it is effective, quick, dynamic, empowering, individual and comprehensive. IoT has also posed some vital challenges to students, educators and administrators. Main purpose of the study was to assess the role of IoT in education. Moreover, issues and challenges regarding IoT in education were also analyzed in this study. A sample of 200 faculty members and PhD scholars was taken randomly. A questionnaire on five points Lickert scale was used as a research tool for the collection of data and its reliability was .86 (Chronbach's Alpha). Collected data were analyzed through SPSS XVIII. The study revealed that IoT helps in shaping smart lesson plans, smart classrooms and smart campuses. This technology allows connectivity of students and educators around the globe. IoT reduces gender disparity and increases students' engagement and teachers' efficiency. This technology promotes collaboration and creativity, enhances access to information, improves safety and enriches teaching learning process. Though this technology helps in improving performance of education system yet some challenges and issues were also witnessed in this study. Lack of financial resources, development, complexity and implementation of IoT, ethics, trust and privacy, quality and data security were major challenges of IoT in education.

### Maha Tony

### Renewable Energy as a Sustainable Resource for Internet of Things (IoT) in Smart Cities

**Abstract:** Urbanization increased drastically in last few years, searching for smart solutions for communication, efficient and sustainable is a research topic. IoT is a recent communication pattern in modern cities that visualizes a near future for connected world. Smart city view aims at utilizing the most innovative communication technologies to maintain added-value services for the management of the city and people. The concept is converting the IoT to computer-based IoT using smart grid transferring the data using a digital power distribution system such renewable energy and efficient resources. Smart city operates in a sustainable way to enhance both energy-efficient and green environment that facing the fossil fuel depletion and the environmental pollution. Depending on green renewable energy i.e. solar, wind and hydrothermal energy can improve the quality of air, waste management, noise control and traffic congestion. For instance, waste management depending on biofuel generation and wastewater treatment based on solar energy techniques and optimizes the data using software (i.e. Matlab and Mathematica) techniques and connected via IoT results in significant economical and ecological advantages. Additionally, IoT based on the renewable energy can dismiss the noise to smart noise. On the same line of air, water and noise control, traffic congestion is a possible smart city service such as camera-based traffic monitoring systems. Another scope of IoT in smart cities is to monitor energy required such as public lighting, transportation, control cameras and heating/cooling of public buildings besides, the increased number of connected spots to afford WiFi connection to people. Although IoT is well known in smart cities in controlling smart homes, traffic-lights, lights and doors, there is a lack in knowing them in day-to-day lives such as the smart water management. This area can get a highly influenced by the IoT technology in the field of wastewater and waste management. Finally, all those sensors and devices for IoT performance are enabled in a smart management and charging way using renewable energy as a sustainable resource.

## Speeches' Abstracts

### \*Omar Abdulkader, \*Vijey Thayanathan, \*Kamal Jambi, Alwi \*\*Bamhdi and \*\*\*Muasaad Alrasheed A novel and Secure Smart Parking Management System (SPMS) based on Integration of WSN, RFID, and IoT

**Abstract:** Nowadays, finding a secure parking lot in modern cities deemed as very hard and time-consuming task. Leaving negative implications on traffic congestion, air pollutions, climate changes, etc. are also creating difficult situations to find the secure parking lot on required time. Thus, Smart Parking System (SPS) deemed inevitable option to solve those issues and build a comprehensive smart transportation system. Toward this end, this paper aims to design a secure and smart parking monitoring, controlling and management solutions based on the integration of Wireless Sensor Network (WSN), Radio Frequency Identification (RFID), Adhoc Network, and Internet of Things (IoT). Considering cyber securi-ty issues in IoT environment, we adopt a lightweight crypto-graphic algorithm that meets IoT device requirements in term of computational cost and energy consumption. Fog computing has been adopted to process and manipulate sensitive data within the edge of the network and accelerate response time for any emer-gency circumstance. The proposed model provides real-time in-formation for detecting parking lots and reservation, e-payment solutions to mitigate traffic congestion, parking management optimization and enhance user experience while preserving user privacy and security.

### Raneen Alzafarani and Ghadi Alyay Energy Efficient IoT Home Monitoring And Automation System

**Abstract:** Saudi Arabia has encountered a great economic growth in oil and gas resources in the past decades, and if domestic consumption rates continue in their current pathways, it is expected that there will be a contraction in oil exports, which will negatively affect Saudi Arabia's ability in the future to maintain the current high levels of spending in both investment and consumption. Residential consumption in Saudi Arabia accounts for 51% of total electricity sold in 2012. Therefore, targeting private residencies will reduce both the amount of fuel needed to generate electricity and the amount of greenhouse gases. This project aims to build a smart home system. This system will monitor and analyze the energy consumption, utilize lights when needed, program the temperature by keeping your house warmer than normal when you are away and setting the temperature as high as comfortable if needed. Then display the information to improve customer awareness by using colored LEDs to alert customers to different parameters, and turn their loads on and off based on the cost of electricity use as well as enable consumers to control some of their home appliances usage through a mobile application to reduce electricity usage and minimize energy waste.

### Mohammed Al Surf Can the IoT Enhance the Conservation of Energy in Saudi Communities?

**Abstract:** IoT has been a great use in the modern world; the importance and usage of IoT's are increasing day by day. Professional nowadays considers the IoT vital to the continuous development of their businesses and must keep evolving to attract more projects and clients. Power management is one of the key obstacles in our daily lives and we tend to disregard how we use power and don't really value how much we consume on a daily basis. IoT based power management system is an effective method for power management. The recent development in Internet of things has helped researchers and industrialist to identify its role in energy in management system. This research will help identify the key elements that the IoT can help the Saudi community appreciate how much energy they consume and will provide solutions to conserve energy and lower the demand especially in peak hours of the day. The outcomes of this research will be later developed as a proposal for the key stakeholders in the Saudi government to provide advice on how to educate the public on conservation methods using the IoT.

## Speeches' Abstracts

**Muhammad Ali Ismail**

### Framework for Real time Crowd Management and Analytics using FOG computing

**Abstract:** Internet of thing (IoT) is driving business transformation by connecting everyday objects and devices to one another and then to cloud hosted service. The multidimensionality of the collected data makes it nearly impossible to be handled by any one independent solution. The fog computing extends the cloud computing where the computational edges (Fog Nodes) is introduced at the various tiers of processing. This paper presents a real time Fog Computing based framework designed for crowd management and its analytics. The proposed framework contains N tiers of Fog nodes levels which can be adjusted according to the system dimensions. These edge nodes are capable of making some initial level of data processing which is sent to its higher level of fog node tier. For real time analytics the framework is integrated with Hadoop and Spark ecosystem. The analytics leads towards the discovery of several important facts about general public behavior and crowd management. From the results obtained, after the verification with the various available results or trends, it is observed that the proposed framework is efficient, fast and suitable to handle big data information because of the implicit support to open system, big data, greater scalability, robustness, parallelism and fault tolerance.

### Makarem Aljahdali, Ahmed Bensenouci, Raghad Abokhamees and \*Mohamed-Amine Bensenouci IoT Based Assistive Walker Device for Frail & Visually Impaired People

**Abstract:** The frequency of falling among elderly and visually impaired people is constantly increasing. This problem affects a large number of people who need additional support to maintain balance and stability while walking. The objective of this study is to design a smart assistive walker device for frail & visually impaired people to reduce the risk of falling and the costly emergency interventions and hospitalizations. The proposed device is based on the concept of the Internet of Things (IoT) to determine and communicate the location and the path of the person for possible action. The device contains hardware and software parts. The former, covering the electrical part of the walker with three components: Sensor, controller, output, and the later contains two components; "Map" and "Find Me" Apps. The IoT treats the information received from the sensors (position, objects, and people around) and sends commands to the controller to guide the walker to fulfill the elderly needs safely. Using the IoT concept and smart device design, we expect a reduction in the number of falls and a contribution in the prevention of disability among elderly and visually impaired people.

### Fatima Alhebshi, Heba Alnabils, Jauhra Alzebaidi, Ahmed Bensenouci and Mohamed-Amine Bensenouci Monitoring the Operation of a Transmission Line in a Smart Grid System through IoT

**Abstract:** Electrical transmission lines are generally exposed to harsh natural environment and leads to different types of failures including thundering, rain, lightning phenomena, flashover, and overheating. The Internet of Things (IoT) represents a step beyond the utilization of conventional SCADA by increasing the use of wireless technology and provides real-time data acquisition. The objective of this paper is to design an Arduino connected to different sensors for monitoring and controlling transmission system problems. These sensors include PIR (Pyroelectric Infra-Red) sensor, relay for control, and wireless sensors for conductor galloping due to the wind, meteorology, and temperature. The IoT is applied by simulating circuit with different sensors to monitor and control possible technical failures

## Speeches' Abstracts

### Salha AlzahraniMervat El-Shafie; Lubabah, Fakh The Smart Environment of Commercial Buildings

**Abstract:** Cities are becoming evidently mature with their decades' implementation of various emerging smart technologies. The era of Internet of Things [IoT] has introduced technical installation, automated management, and ubiquitous sensors, which contributed to the rise of smart cities in the early 21st century. Buildings, which were historically identified as shelters and urban machines, are now becoming 'smart' and turning into urban devices. Although research has progressed applications' development in various areas, including the environmental monitoring, water management, surveillance, lighting management smart services, and crowd-sensing, there is a clear gap in the application of the IoT concept in a more confined physical space, specifically in commercial building environments. That being said, there is a growing number of innovative social and people-centric application areas, including social networking, which would help in creating buildings that respond to their contents as well as the outer environment. These buildings would serve both the exterior and the interior users, and architecture would be classified as an active element in the world of today. This research focuses on constructing conceptually transparent commercial building environments through means of interactive architecture. The paper aims to visually portray the crowd levels on the commercial buildings' skin, and explore the required components that develop smart building systems and their applications. The main objective of this study is to suggest design guidelines that accommodate IoT systems to create architecture that is able to serve people in real-time, and in a responsive manner.

### Samah El Khateeb IoT Architecture a Gateway to Smart Cities in Arab World

**Abstract:** In the last years, the world has jumped rapidly towards more urbanization, and for the first time in the history in 2008 urban population exceeded the rural population. By 2050 it is expected that two-thirds of the world population will live in urban areas. As a result of this rapid urbanization worldwide, smart cities emerged as a significant formation of cities that help in achieving sustainable development and smart growth. Smart cities definition varies depending on whom you talk to, the main mission of a smart city is to optimize city functions and lead economic growth as well as, improving quality of life for its residents using smart technology and data analysis. Designing a smart city is not happening on the spot, it needs visionary leadership to lead the emerging of the smart city and its architecture platform. The conceptualization of Smart city, varies from country to another, depending on many aspects including the level of development' of the country. A smart city in Europe or India will have different characteristics compared to a smart city in the Arab world. The Internet of things IoT is defined as an integrated part of the future Internet, which ensures that 'things' with identities can communicate and connect to each other. The application of the IoT architecture needs different architecture, leadership and architect. This research paper aims to explore the principles of designing a smart city by understanding the IoT architecture of the creation of smart cities, especially in the Arab world. The research is a documentary research with a case study analysis to understand the principles of smart cities with emphasis on the IoT Architecture. Case studies will be a world example of smart cities that followed IoT architecture platform.



## Speeches' Abstracts

### Asma Fatani, Afnan Kanawi, Hedaih S. Alshami, Ahmed Bensenouci and Mohamed-Amine Bensenouci Dual pH Level Monitoring and Control using IoT Application

**Abstract:** Potential of Hydrogen (pH) level is one of the main characteristics of any chemical solution. It plays a significant role in chemistry, pharmacy, medicine, agriculture, fish farming, and industries. Lately, Internet of Things (IoT) appears as a new era of research and applications. IoT is designed to connect both digital and physical objects using communication technology. The main objective of this paper is to build a tool that allows real-time control of the pH level of a specific solution or product using the Internet of Things (IoT) concept. Specifically, this tool is made of an Arduino that is connected to both a designed mobile app and a physical device using the internet. This app allows the user to choose either automatic (auto) or manual (manual) control modes. In the former, the system will behave as a feedback control scheme where the user will be requested to specify the desired pH value and the specific period needed to keep the experiment running. In the later (manual), the user should set the amounts of acidic and alkaline solutions in each pumping process.

### Kamel Ammour Factory Automation and Irrigation Control Systems in an IoT Environment

**Abstract:** The present paper investigates the possibility to control working and stopping of machines (composing a factory, an irrigation process and so on) controlled by a website via the internet from any place in the world. The idea is to send commands from a website to a factory (irrigation process) computer program control via a shared database in IoT environment. The attempt has shown very successful results both in a factory tar productivity for converting a panel board control to a computer program control and in a model irrigation system control from a website via a shared database.

### Aziza Hussein and Charles Rajesh Kumar VLSI design of energy efficient computational-centric smart objects for IoT

**Abstract:** Traditional standalone embedded system and its computational elements firmly connect with physical entities such as Input-Output devices and sensor networks in IoT applications such as medical monitoring, smart grids, smart cities, environmental monitoring systems which are gaining attraction among institutions and industries. A huge quantity of sensors are added to the IoT, and the processing of a large amount of data coming from Input-Output devices and sensor networks increases the energy consumption. To have more efficiency, the mobility of IoT based system requires low energy consumption. Smart devices perform the data offloading to external devices with increased communication effort, and this effort contribute to the overall power consumption of the smart devices. This power hungry nature of the communication infrastructure and computational resources using cloud computing is not very much suitable to design the future computational system. This nature changed the trend to shift the smartness of the things more adjacent to the things themselves and network edge (FoG) instead of towards the cloud. This shift can improve the computing capacity of the smart objects and limit energy consumption. This paper aims at exploring emerging approaches, ideas, and contributions to address the challenges in the design of energy efficient computational centric smart objects for IoT. A proposed energy-efficient Network on Chip (NoC) architecture for embedded high-performance computing is provided.



# EMBEDDING INTELLIGENCE











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《《Layout》》



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-  2 Registration Area
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-  5 Lecture Room First Floor
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-  7 Training Room
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-  10 Lunch Area

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