2017 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT)

11-13 October, 2017

The University of Jordan
Amman, Jordan

http://www.aeect.net

Program Contents

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Message from the General Chair

On behalf of the Conference Organizing Committee, it gives me a great pleasure to welcome you to the 2017 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT). I am honored to be the General Chair of the organizing team of such an important and interesting event, which is taking place in the University of Jordan, Amman, Jordan, during Oct 11-13, 2017. This conference is the fourth of a series of biannual conferences organized by the IEEE – Jordan Section with leading Jordanian universities.

The theme of this conference is "Technology for Solving National Problems." This theme is a symbolic reflection of the importance of electrical engineering and computing technologies in solving many problems that face Jordan and other countries. This international conference provides a unique forum to discuss practical approaches and state of the art findings in using these technologies to solve national problems related to energy, communications, computing, management, health, business, and other areas.

AEECT 2017 has received papers in its seven tracks that cover the various aspects of the electrical engineering and computing technologies. Each of these papers was sent to three expert reviewers or more. Out of the 93 received papers, only 47 papers are included in the conference proceedings and are presented in the nine technical sessions of this conference. The papers that are successfully presented are also submitted for publication to the IEEE Xplore digital library and indexed in Scopus.

We are proud to have in this conference program four distinguished keynote speakers who deliver interesting speeches tiled: The Fourth Industrial Revolution, Multi-Cloud Global Application Delivery for Internet of Things and Smart Cities, Will the Lights Stay On?, and Cognitive Vigilance Enhancement using Challenge Integration in Surveillance Tasks. Moreover, the conference includes a panel discussion on Innovation, Entrepreneurship, and Research Synergy in Jordan: Opportunities and Challenges.

We would like to thank the University of Jordan and Al-Zaytoonah University of Jordan for organizing, sponsoring, and supporting this conference, as well as IEEE Computer Press for publishing the conference proceedings. Moreover, we would like to thank the main conference supporters and sponsors: the Scientific Research Support Fund, Atypon Systems Inc, Specialized Technical Services, Dell EMC, Philadelphia University, University of Petra, Estarta Solutions Inc, Systems & Electronic Development FZCO (SEDCO), Jordan Bromine Company, Jordan Engineers Association, Shams Maan Power Generation, and Jordan Tourism Board.

Last but not least, we would like to express our deepest appreciation to the members of the organizing committee for their valuable efforts in making AEECT 2017 a successful event, as well as our advisory committee, scientific committee, expert reviewers, and student volunteers.

We are looking forward to an exciting, vibrant assembly in our venue and we welcome the AEECT 2017 participants in the University of Jordan in Amman.

Prof. Gheith Abandah
AEECT 2017, General Chair
IEEE – Jordan Section, Chair
The University of Jordan, Computer Engineering
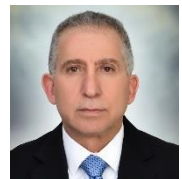
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AEECT 2017 Program Outline

Legend		
🟩 Large Auditorium	🟧 Middle Auditorium	🟦 Small Auditorium

Time	Large Auditorium	Middle Auditorium	Small Auditorium
Day 1: Wednesday - October 11, 2017			
08:30-18:00	Registration		
10:00-10:30	Opening Ceremony		
10:30-11:00	Coffee Break		
11:00-12:00	**Panel Discussion:** Innovation, Entrepreneurship, and Research Synergy in Jordan: Opportunities and Challenges (Bilingual A/E)	**IEEE Jordan Student Branches Meetup**	
12:00-13:00	**Keynote Speech 1:** Prof. Rolf Biesenbach, Bochum University of Applied Sciences, Germany		
13:00-14:30	Lunch in the University Restaurant		
14:30-15:30	**Keynote Speech 2:** Prof. Hasan Al-Nashash, American University of Sharjah	**IEEE Jordan Young Professionals Meetup**	
15:30-16:00	Coffee Break		
16:00-18:00	**IT1: Smart Applications**	**Control and Mechatronics**	**C1: Antenna Design**
Day 2: Thursday – October 12, 2017			
09:30-18:20	Registration		
09:30-10:30	**Keynote Speech 3:** Prof. Raj Jain, Washington University in St. Louis		
10:30-11:00	Coffee Break		
11:00-13:00	**IT2: Algorithms & AI**	**Computer Eng. & Networks**	**C2: Wireless Comm.**
13:00-14:30	Lunch in the University Restaurant		
14:30-15:30	**Keynote Speech 4:** Prof. Ghanim Putrus, Northumbria University Newcastle, UK		
15:30-16:00	Coffee Break		
16:00-18:20	**IT3: Machine Learning**	**Biomedical Engineering**	**Power & Energy Systems**
20:00-22:00	Gala Dinner in Le Royal Amman		
Day 3: Friday – October 13, 2017			
10:00-17:00	Trip to The Dead Sea		

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Day 1: Wednesday

October 11, 2017
8:30 – 18:00

Indicates a Presenting Author

Time	Item	Place
08:30-18:00	**Registration**	*Registration Area*
10:00-10:30	**Opening Ceremony**	*Large Auditorium*
10:30-11:00	**Coffee Break**	*Break Area*
11:00-12:00	**Panel Discussion** *Innovation, Entrepreneurship, and Research Synergy in Jordan: Opportunities and Challenges (Language: Arabic and English)*	*Large Auditorium*
11:00-12:00	**IEEE Jordan Student Branches Meetup**	*Middle Auditorium*
12:00-13:00	**Keynote Speech 1** **Prof. Rolf Biesenbach** Bochum University of Applied Sciences, Germany *Smart Factory: The 4th Industrial Revolution* Session Chair: Lutfi Al-Sharif, The University of Jordan	*Large Auditorium*
13:00-14:30	**Lunch**	*The University Restaurant*
14:30-15:30	**Keynote Speech 2** **Prof. Hasan Al-Nashash** American University of Sharjah, Cognitive Vigilance *Enhancement using Challenge Integration in Surveillance Tasks* Session Chair: Gheith Abandah, The University of Jordan	*Large Auditorium*
14:30-15:30	**IEEE Jordan Young Professionals Meetup**	*Middle Auditorium*
15:30-16:00	**Coffee Break**	*Break Area*

16:00-18:00	**IT1: Smart Applications**	*Large Auditorium*

Session Chair: Ali Maqousi, Petra University, Jordan

Paper 1 *Investigation of Mobile App Behaviors from the Aspect of Real World Mobile Backend System*
> Jen-Hao Kuo and He-Ming Ruan* (National Taiwan University); Chun-Yi Chan (Shanghai Droi Technology, Taiwan); Chin-Laung Lei (National Taiwan University)

Paper 2 *Indoor Wi-Fi Tracking System*
> Bassam Jamil* (Hashemite University, Jordan); Ibtehal Ahmad Amro (Jordan)

Paper 3 *Improving Email Spam Detection Using Content Based Feature Engineering Approach*
> Wadi' Hijawi* (Jordan Information Security and Digital Forensics Research Group); Hossam Faris, Ja'far Alqatawna, Ala' Al-Zoubi, and Ibrahim Aljarah (The University of Jordan)

Paper 4 *Abusing Android Permissions: A Security Perspective*
> Iman Almomani* and Mamdouh Alenezi (Prince Sultan University, Saudi Arabia)

Paper 5 *Mobile Intra-Campus Student Social Network (MiCSSN)*
> Ibrahim Al-Oqily*, Emad E. Abdallah, and Alaa Abdallah (Hashemite University, Jordan)

16:00-18:00	**Control and Mechatronics**	*Middle Auditorium*

Session Chair: Tarek A. Tutunji, Philadelphia University, Jordan

Paper 1 *Maximum Allowable Delay Bound Estimation Using Lambert W Function*
> Asma Alfergani, Ashraf Khalil, Zakaryia Rajab, and Mohammad Zuheir* (University of Benghazi, Libya); Sheroz Khan (Inetrnational Islamic University Malaysia)

Paper 2 *System Identification for a Liquid Flow Process*
> Walaa Araydah*, Tarek A. Tutunji, and Ibrahim Naimi (Philadelphia University, Jordan)

Paper 3 *Estimating the Elevator Traffic System Arrival Rate Using Exponentially Weighted Moving Average (EWMA)*
> Ahmad Hammoudeh and Lutfi Al-Sharif* (The University of Jordan)

| 16:00-18:00 | **C1: Antenna Design**
Session Chair: Mohamed K Abdelazeez, The University of Jordan | *Small Auditorium* |

Paper 1 *A 4-Element Sub-Array with 4-Polarization Modes*
Yanal S Faouri* (The University of Jordan); Rifaqat Hussain and Mohammad S. Sharawi (King Fahd University of Petroleum and Minerals, Saudi Arabia)

Paper 2 *Microstrip Antenna for Radiation Pattern Reconfigurability*
Shumo'a Hamdan* and Yanal S Faouri (The University of Jordan)

Paper 3 *UWB Antenna Based on Ground Modifications*
Noor Awad, Mohamed K Abdelazeez, and Ahmad Al. Sharif* (The University of Jordan)

Paper 4 *UWB Antenna with Corner Modified Patch*
Ahmad Al. Sharif*, Sari Amle, Noor Awad, and Mohamed K Abdelazeez (The University of Jordan)

Paper 5 *Design of Linear Antenna Arrays Using Antlion and Grasshopper Optimization Algorithms*
Anas Atef Amaireh* and Asem Alzoubi (Yarmouk University, Jordan); Nihad I Dib (Jordan University of Science and Technology)

Paper 6 *Structural and Optical Properties of Silicon NanoDots Grown on Silicon Substrate*
Fatima Idrees* (University of Bisha, Saudi Arabia); Hala Eldaw Idris (Sakakah, Aljouf, Saudi Arabia)

Day 2: Thursday

October 12, 2017
9:30 – 18:20

Time	Item	Place
09:30-18:20	**Registration**	*Registration Area*
09:30-10:30	**Keynote Speech 3** **Prof. Raj Jain** Washington University in St. Louis *Multi-Cloud Global Application Delivery for Internet of Things and Smart Cities* Session Chair: Iyad Jafar, The University of Jordan	*Large Auditorium*
10:30-11:00	**Coffee Break**	*Break Area*
11:00-13:00	**IT2: Algorithms & AI** Session Chair: Muder Almaani, Al-Hussein Bin Talal University, Jordan **Paper 1** *Landmark Detection from Sidescan Sonar Images* Mohammed S Al-Rawi* (Universidade de Aveiro, Portugal); Adrian Galdran (Tecnalia Research and Innovation, Spain); Fredrik Elmgren (DeepVision AB, Sweden); Joaquim Bastos (Instituto de Telecomunicações, Portugal); Jonathan Rodriguez (Universidade de Aveiro, Portugal); Marc Pinto (ECA Group, France) **Paper 2** *Preventing Identity Theft Using Biometrics Based Authentication System* Syed Rizvi, Lamjed Zahrouni*, Dayton Blackwood, and Joseph Gualdoni (Pennsylvania State University, USA); Muder Almiani (Al-Hussein Bin Talal University, Jordan) **Paper 3** *Smart Controlling for Traffic Light Time* Ala'a Abu Zaid*, Yazan Suhweil, and Musa Al Yaman (The University of Jordan) **Paper 4** *Secure Model for Distributed Data Structures on Distributed Hash Tables* Raed Al-Aaridhi* and Ahmet Yüksektepe (University of Duesseldorf, Germany); Kalman Graffi (Heinrich Heine University Düsseldorf, Germany)	*Large Auditorium*

Paper 5 *Embedded System Implementation for Material Recognition Using Deep Learning*

> Khaled Younis*, Waed Ayyad, and Abdallah Al-Ajlony (The University of Jordan)

Paper 6 *A New Visual Tool to Improve the Effectiveness of Teaching and Learning CPU Scheduling Algorithms*

> Yosef Hasan Jbara* (Buraydah Colleges, Saudi Arabia)

11:00-13:00

Computer Eng. & Networks
Session Chair: Abdel-Karim Al-Tamimi, Yarmouk University, Jordan

Middle Auditorium

Paper 1 *Design and Simulation of Enhanced 64-bit Vedic Multiplier*

> Syed Zohaib Hassan Naqvi* (University of Enginnering and Technology, Pakistan)

Paper 2 *A Measurement Study of Internet Services in Jordan: A Case Study*

> Mohammad Masoud*, Yousef Jaradat, Ismael Ahmad Jannoud, and Esraa Bashayreh (Al-Zaytoonah University of Jordan)

Paper 3 *Configurable-Accuracy Approximate Adder Design with Light-Weight Fast Convergence Error Recovery Circuit*

> Khaled Al-Maaitah*, Issa Qiqieh, Ahmed AbdelAal, and Alex Yakovlev (Newcastle University, United Kingdom (Great Britain))

Paper 4 *Access Point Localization Using Autonomous Mobile Robot*

> Fahed H Awad, Ammar Omar, Muhammad Naserllah*, Alaa Abu-Hantash, and Abrar Al-Taj (Jordan University of Science and Technology)

11:00-13:00

C2: Wireless Communications
Session Chair: Ala' Khalifeh, German Jordanian University, Jordan

Small Auditorium

Paper 1 *A Cross-Layer SCTP Design for Speed -Based Handover Decision in V2I Communication*

> Hala Eldaw Idris* (Sakakah, Aljouf, Saudi Arabia); Fatima Idrees (Unversity of Bisha, Saudi Arabia)

Paper 2 *Empirical Path Loss Models for Low Power Wireless Sensor Nodes Deployed on the Ground in Different Terrains*

> Tajudeen Olasupo (Florida Institute of Technology, USA); Abdulaziz S. Alsayyari* (Shaqra University, Saudi Arabia); Carlos Otero, Kehinde O Olasupo, and Ivica N. Kostanic (Florida Institute of Technology, USA)

Paper 3 *Developing a Secondary Mobile Network in the Palestinian GSM Band Using Cognitive Radio*
>Ahmed Abdou (Al-Quds University, Palestine); Osama Najajri (Palestine Polytechnic University); Ali Jamoos* (Al-Quds University, Palestine)

Paper 4 *Energy Harvesting with Cooperative Networks and Adaptive Transmission*
>Admoon Andrawes*, Rosdiadee Nordin, and Mahamod Ismail (Universiti Kebangsaan Malaysia)

13:00-14:30	**Lunch**	*The University Restaurant*

14:30-15:30	**Keynote Speech 4** **Prof. Ghanim Putrus** Northumbria University Newcastle, UK *Will the Lights Stay On?* Session Chair: Eyad A. Feilat, The University of Jordan	*Large Auditorium*

15:30-16:00	**Coffee Break**	*Break Area*

16:00-18:20	**IT3: Machine Learning** Session Chair: Ibrahim Al-Oqily, Al Yamamah University, Saudi Arabia	*Large Auditorium*

Paper 1 *Simultaneous Clustering of Multiple Heterogeneous Gene Expression Datasets*
>Basel Abu-Jamous* and Steven Kelly (University of Oxford, United Kingdom (Great Britain))

Paper 2 *Use Filtering Techniques to Improve the Accuracy of Association Rules*
>Zainab Darwish* (The University of Jordan); Mousa Tawfiq Al-Akhras and Mohamed Habib (Saudi Electronic University, Saudi Arabia)

Paper 3 *A Spectral Clustering Approach to Determine the Relationship Between Technology Use and Academic Performance*
>Nazir S. Hawi* and Maya Samaha (Notre Dame University-Louaize, Lebanon)

Paper 4 *Investigating Hybrid Approaches for Arabic Text Diacritization with Recurrent Neural Networks*
>Saba Alqudah*, Gheith A. Abandah, and Alaa Arabiyat (The University of Jordan)

Paper 5 *Arabic Sentiment Analysis of YouTube Comments*
>Abdel-Karim Al-Tamimi (Yarmouk University, Jordan); Ali Shatnawi and Esraa Bani-Issa* (Jordan University of Science and Technology)

Paper 6 *The Effect of Diacritization on Arabic Speech Recognition*
> Fawaz Al-Anzi and Dia AbuZeina* (Kuwait University)

| 16:00-18:20 | **Biomedical Engineering**
Session Chair: Awad Al-zaben, Yarmouk University, Jordan | *Middle Auditorium* |

Paper 1 *Feature Extraction of Heart Sounds Using Velocity and Acceleration of MFCCs Based on Support Vector Machines*
> Mohamed Moustafa Azmy* (Alexandria University, Egypt)

Paper 2 *Heart Sounds Recognition Using Multifractal Detrended Fluctuation Analysis and Support Vector Machine*
> Mohamed Moustafa Azmy* and Reem Mohamady (Alexandria University, Egypt)

Paper 3 *A New Algorithm for Short Term Prediction of Persistent Atrial Fibrillation*
> Hisham ElMoaqet* (University of Michigan - Ann Arbor, USA); Zakaria Almuwaqqat (Emory University, USA); Mutaz Ryalat and Natheer Almtireen (German Jordanian University, Jordan)

Paper 4 *Traffic Light Detection for Colorblind Individuals*
> Jamal Al-Nabulsi* (Hashemite University, Jordan); Abdelwadood Mesleh (Jordan); Adnan Yunis (Al-Ahliyya Amman University, Jordan)

Paper 5 *The Melanoma Skin Cancer Detection and Classification Using Support Vector Machine*
> Hiam Alquran*, Isam Abu Qasmieh, Ali Mohammad Alqudah Sajidah Alhammouri, Israa Alawneh, Ammar Abu-Ghazaleh, and Firas Hasayen (Yarmouk University, Jordan)

Paper 6 *A Distributed Model for Automated Diagnosis of Whole-Slide H&E Stained Prostate Tissue Images*
> Safaa Al-Haj Saleh* (The Hashemite University, Jordan); Omar Al-Kadi (The University of Jordan)

Paper 7 *Predicting Quality of Life for Lung Transplant Recipients: A Hybrid Genetic Algorithms-based Methodology*
> Lina Al-Ebbini* (Yarmouk University, Jordan); Asil Oztekin (University of Massachusetts Lowell, USA); Zulal Sevkli (Fatih University, Turkey); Dursun Delen (Oklahoma State University, USA)

16:00-18:20	**Power & Energy Systems** Session Chair: Ghanim Putrus, Northumbria University, UK	*Small Auditorium*

Paper 1 *Control of Master-Slave Microgrid Based on CAN Bus*

> Ashraf Khalil, Asma Alfergani, Zakaryia Rajab, and Mohammad Zuheir* (University of Benghazi, Libya); Sheroz Khan, Ezzidin Hassan Aboadla, and Khairil Azhar Aznan (International Islamic University Malaysia); Majdee Tohtayong (Princess of Naradhiwas University, Thailand)

Paper 2 *Faults Detection and Diagnosis of Transmission Lines Using Wavelet Transformed Based Technique*

> Bilal Masood and Umar Saleem* (Superior University, Pakistan); Muhammad Nadeem Anjum (National Transmission and Dispatch Company, Pakistan); Usman Arshad (Superior University, Pakistan)

Paper 3 *Performance Evaluation of Stand Alone WECS Three Phase Diode Clamped Inverter Based on Level Shifted Carriers PWM Techniques*

> Anas Baayou*, Anas Sultan, Ahmed Hammoda, and Adel Ibrahim Mussa Mohamed (University of Benghazi, Libya)

Paper 4 *Analysis of Virtual Output Impedance and Gird Interaction of Photovoltaics System*

> Khaled Alawasa* (Mutah University, Jordan)

Paper 5 *The Potential of the Rooftop Grid-Connected PV Systems in Benghazi*

> Hana Shamatah* and Salima Azouz (Tatweer Research, Libya); Ashraf Khalil and Zakaryia Rajab (University of Benghazi, Libya)

Paper 6 *Optimal Cost-Based Model for Sizing Grid-Connected PV and Battery Energy System*

> Yara Khawaja*, Damian Giaouris, Haris Patsios, and Mohamed Dahidah (Newcastle University, United Kingdom (Great Britain))

20:00-22:00	**Gala Dinner**	*Le Royal Amman*

Day 3: Friday

October 13, 2017
10:00 – 17:00

Time	Item	Place
09:30-10:00	**Registration**	*Registration Area*
10:00-17:00	**Trip to The Dead Sea**	*The Dead Sea*

If weather permits, you can swim in the Dead Sea or in the swimming pools.
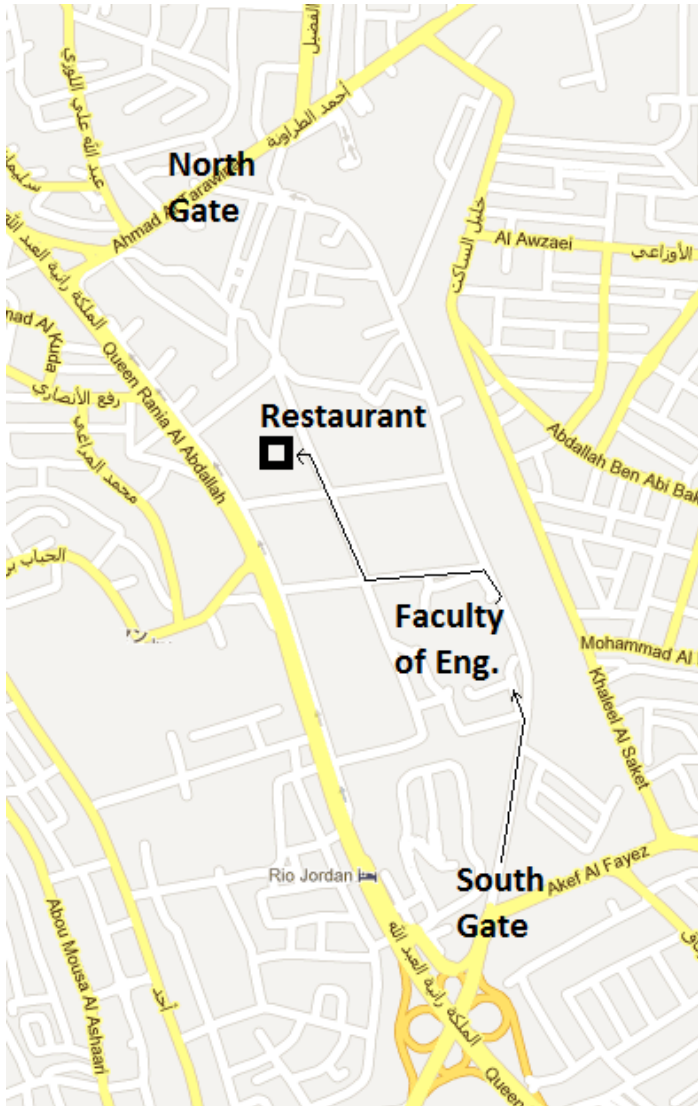
If you plan to swim, bring your swimwear. The hotel provides one towel per person.

Area Map
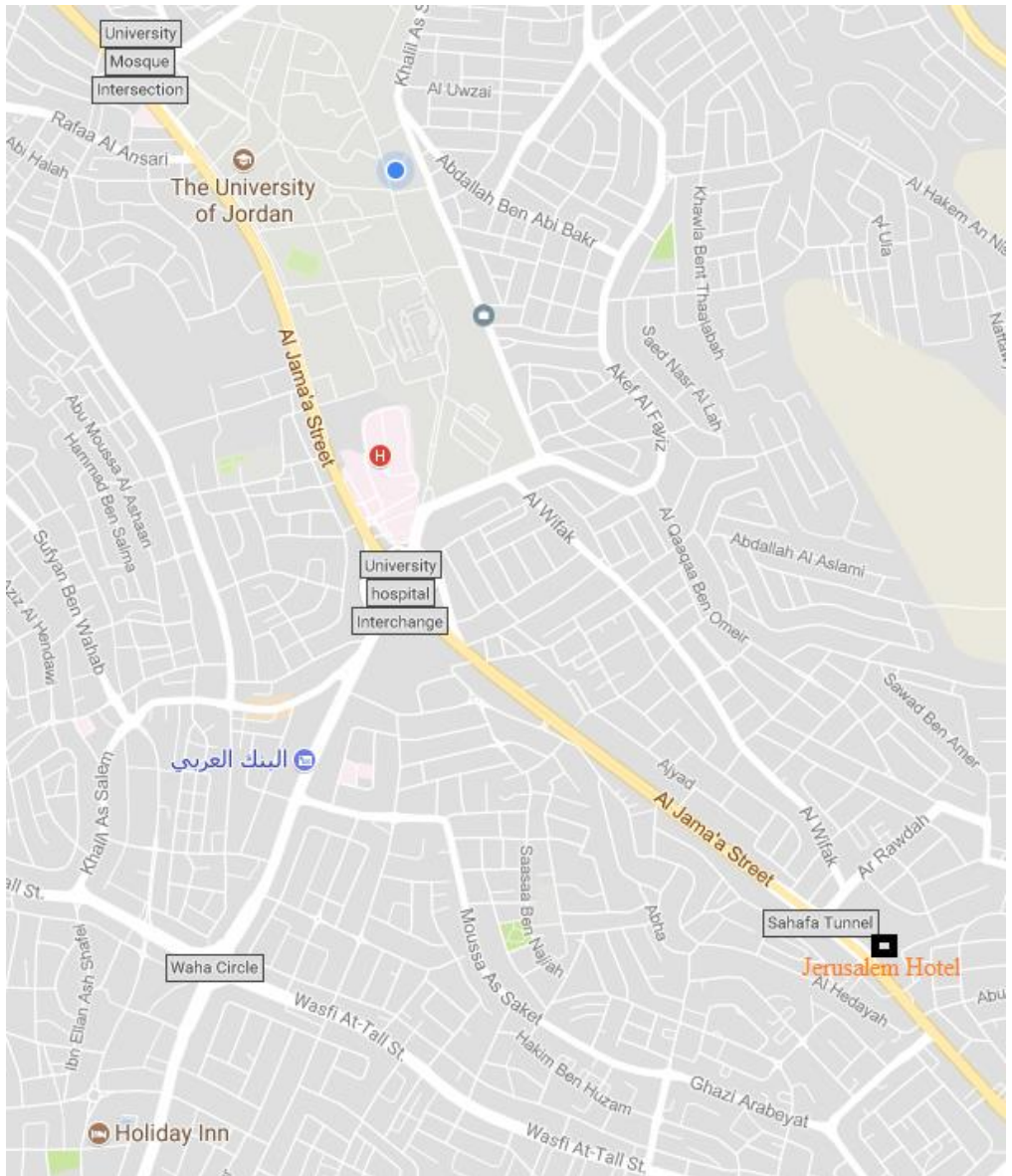
- This map shows the University of Jordan (North), the Holiday Inn (South West), and the Jerusalem Hotel (South-East). The University of Jordan's South Gate is north of the University Hospital Interchange.

The University of Jordan Map

- The School of Engineering (SoE) is about 700 m north of the South Gate. SoE is on the left side of the Main University Street. There is an old jet fighter at the entrance of SoE parking lot. The venue entrance is at the northern edge of the parking lot.
- The restaurant is about 800 m north of SoE. On the Main University Street, travel north, take the first left, travel west and at the cross road, take right, the university restaurant is 400 m from this cross road on the left side of the Central University Road.

School of Engineering Map
Auditoriums Area

WC

Registration Desk

Entrance Hall

A

B

C
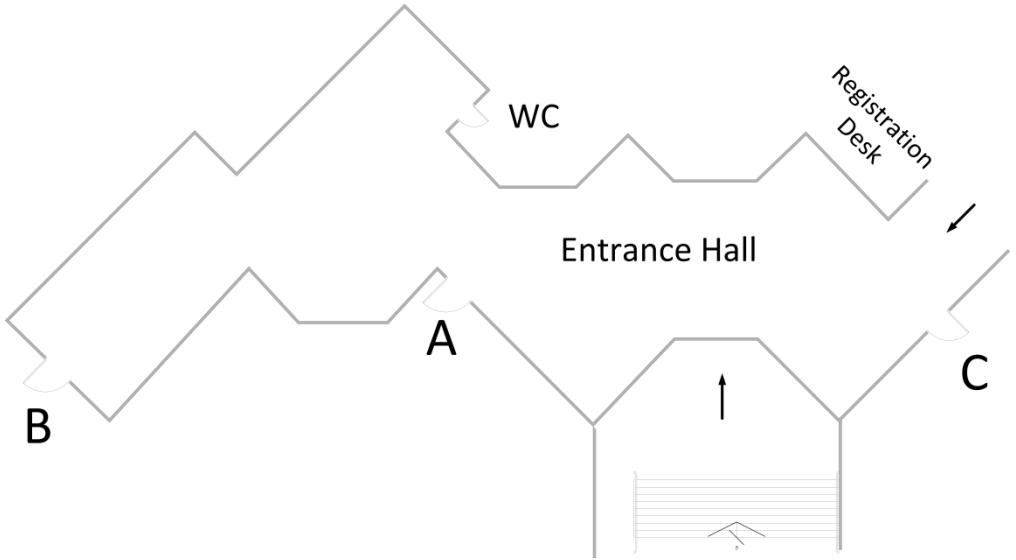
Index:

A	**The Large Auditorium** (Saeed Al-Mofi Auditorium)	**مدرج سعيد المفتي**
B	**The Medium Auditorium**	**المدرج الأوسط**
C	**The Small Auditorium**	**المدرج الصغير**

- When you enter the SoE auditoriums area from the main School entrance, the Large and Medium Auditoriums are on the left and the Registration Desk and the Small Auditorium are on the right.
- The Entrance Hall has wireless internet access. Refer to the Registration Desk for the username and password.

Bus Timetable for Registered AEECT 2017 Participants

Day 1: Wed 11/10/2017	Day 2: Thu 12/10/2017	Day 3: Fri 13/10/2017
Morning	**Morning**	**Morning**
08:30 *The Univ. of Jordan	08:30 The Univ. of Jordan	09:20 The Univ. of Jordan
08:45 Holiday Inn Hotel	08:45 Holiday Inn Hotel	09:40 Jerusalem Hotel
09:15 Jerusalem Hotel	09:15 Jerusalem Hotel	10:00 The Univ. of Jordan
09:30 The Univ. of Jordan	09:30 The Univ. of Jordan	10:20 Holiday Inn Hotel
		11:15 The Dead Sea
Evening	**Evening**	
18:00 The Univ. of Jordan	18:20 The Univ. of Jordan	**Evening**
18:20 Holiday Inn Hotel	18:40 Holiday Inn Hotel	15:30 The Dead Sea
18:50 Jerusalem Hotel	19:10 Jerusalem Hotel	16:25 Holiday Inn Hotel
19:15 The Univ. of Jordan		16:45 Jerusalem Hotel
	Gala Dinner	17:00 The Univ. of Jordan
	19:30 Holiday Inn Hotel	
	19:30 Jerusalem Hotel	
	20:00 Le Royal Hotel	
	22:00 Le Royal Hotel	
	22:20 Jerusalem Hotel	
	22:40 Holiday Inn Hotel	

* In the University of Jordan, the bus stop in the parking lot of the School of Engineering and Technology. *These are the expected departure and arrival times. Some delays may occur due to unfavorable traffic conditions.*

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