

# **2019 International Conference on Promising Electronic Technologies (ICPET 2019)**

**Gaza City, Palestine  
23 – 24 October 2019**



**IEEE Catalog Number: CFP19M90-POD  
ISBN: 978-1-7281-2338-7**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19M90-POD
ISBN (Print-On-Demand):	978-1-7281-2338-7
ISBN (Online):	978-1-7281-2337-0

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2019 International Conference on Promising Electronic Technologies (ICPET) ICPET 2019

## Table of Contents

Message from the General and Program Chairs	ix
Committee	x
Keynote	xiii

### Keynote Talk I

Design Patterns to Build Large Resilient and Predictable Systems	1
<i>Raimund Kirner (University of Hertfordshire)</i>	

### Capacity Building in Engineering

Work in Progress – Establishing a Master Program in Cyber Physical Systems: Basic Findings and Future Perspectives	4
<i>Isam Ishaq (Al-Quds University, Palestine), Rashid Jayousi (Al-Quds University, Palestine), Salaheddin Odeh (Al-Quds University, Palestine), Ezzaldeen Edwan (Palestine Technical College – Deir El-Balah, Palestine), Asmaa Shaheen (Palestine Technical College – Deir El-Balah, Palestine), Mohamed Elnaggar (Palestine Technical College – Deir El-Balah, Palestine), Ahmed Elagha (Palestine Technical College – Deir El-Balah, Palestine), Samy Salamah (Palestine Technical College – Deir El-Balah, Palestine), Christian Weber (University of Siegen, Germany), Hasan Abu Rasheed (University of Siegen, Germany), Raimund Kirner (University of Hertfordshire, UK), Martina Doolan (University of Hertfordshire, UK), Hamidreza Ahmadian (University of Siegen, Germany), Roman Obermaisser (University of Siegen, Germany), Dhiah el Diehn I. Abou-Tair (German Jordanian University, Jordan), Ala Khalifeh (German Jordanian University, Jordan), Sahel Alouneh (German Jordanian University, Jordan), Zaid Alhalhouli (Tafila Technical University, Jordan), Khalid Alemerien (Tafila Technical University, Jordan), Faiez Gargouri (University of Sfax, Tunisia), Bassem Bouaziz (University of Sfax, Tunisia), Nadia Aloui (University of Carthage, Tunisia), and Mohammad Saleh (KTH Royal Institute of Technology, Sweden)</i>	
Rehabilitation Engineering Needs Assessment and Curriculum Development for Palestinian Territories	10
<i>Taleb B. F. Alrayyes (The Islamic University of Gaza, Palestine), Sadiq Abdelall (The Islamic University of Gaza, Palestine), Ahmed Issa (Al Azhar University – Gaza, Palestine), Mohammad O. A. Aqel (Al Azhar University – Gaza, Palestine), and Salah R. Alagha (American University in Cairo, Egypt)</i>	

## Rehabilitation Engineering

Review of Recent Research Trends in Assistive Technologies for Rehabilitation .16.....	
<i>Mohammad O. A. Aqel (Al Azhar University – Gaza, Palestine), Ahmed Issa (Al Azhar University – Gaza, Palestine), Abeer A. Elsharif (Al Azhar University – Gaza, Palestine), Suad Ghaben (Al Azhar University – Gaza, Palestine), Y. S. M. Alajerami (Al Azhar University – Gaza, Palestine), Hassan Khalaf (El-Wafa Medical Rehabilitation and Specialized Surgery Hospital, Palestine), Taleb Alrayyes (The Islamic University of Gaza, Palestine), Daniel Bratanov (University of Ruse “Angel Kanchev”, Bulgaria), Mojca Debeljak (University Rehabilitation Institute, Slovenia), and Dermot Brabazon (Dublin City University, Ireland)</i>	
Build and Control of a Continuous Passive Motion Device using Mobile Application and Arduino .22.....	
<i>Ahmed Issa (Al Azhar University – Gaza, Palestine), Mohammad O. A. Aqel (Al Azhar University – Gaza, Palestine), Suad Ghaben (Al Azhar University – Gaza, Palestine), Areej Abu Asad (Al Azhar University – Gaza, Palestine), Kawther Eldahdooh (Al Azhar University – Gaza, Palestine), Salwa Alastal (Al Azhar University – Gaza, Palestine), and Daniel Bratanov (University of Ruse “Angel Kanchev”, Bulgaria)</i>	
Development of Vibro-Tactile Braille Display and Keyboard .28.....	
<i>Mohammad O.A. Aqel (Al-Azhar University-Gaza, Palestine), Ahmed Issa (Al-Azhar University-Gaza, Palestine), Ahmad Harb (Al-Azhar University-Gaza, Palestine), and Jihad Shehada (Al-Azhar University-Gaza, Palestine)</i>	

## IoT and Smart Systems

Building a Smart Domestic Water Management Controller .34.....	
<i>Mohamed Abdelati (The Islamic University of Gaza, Gaza, Palestine) and Georg Frey (Saarland University, Saarbrücken, Germany)</i>	
IoT-Enabled Adaptive Smart Water Distribution Management System .40.....	
<i>Haya Sammaneh (An-Najah National University) and Muhannad Al-Jabi (An-Najah National University)</i>	
Automated NFC-Based System for Management and Tracking of Assets in Sharing Economy .45.....	
<i>Ezzaldeen Edwan (Palestine Technical College - Deir El-Balah, Palestine), Fatma Shaheen (Palestine Technical College - Deir El-Balah, Palestine), Asmaa Shaheen (Palestine Technical College - Deir El-Balah, Palestine), and Asmaa Sarsour (Palestine Technical College - Deir El-Balah, Palestine)</i>	
Mobile Application for Bumps Detection and Warning Utilizing Smartphone Sensors .50.....	
<i>Ezzaldeen Edwan (Palestine Technical College - Deir El-Balah), Nader Sarsour (Palestine Technical College - Deir El-Balah), and Manar Alatrash (Palestine Technical College - Deir El-Balah)</i>	
Modeling and Controlling Smart Traffic Light System Using a Rule Based System .55.....	
<i>Islam Mohammad Albatish (Al-Azhar University, Gaza, Palestine) and Samy S. Abu-Naser (Al-Azhar University, Gaza, Palestine)</i>	

## Communication Systems

- Design and Analysis of Compact MIMO Antenna for UWB Applications .61.....  
*Watan Zafer (Al-Quds University), Mohammad Kouali (Al-Quds University), and Atallah Balalem (PTUK University)*
- Complexity Analysis of FBMC/OQAM Transceiver using SRRC Polyphase Filter .67.....  
*Imad A. Shaheen (University College of Science and Technology Gaza – Palestine) and Abdelhalim Zekry (Ain Shams University Cairo-Egypt)*
- Design and Implementation of FBMC/OQAM Transceiver for 5G Wireless Communication System .73.....  
*Imad A. Shaheen (University College of Science and Technology Gaza – Palestine) and Abdelhalim Zekry (Ain Shams University Cairo-Egypt)*
- CS-ACELP Speech Coding Simulink Modeling, Verification, and Optimized DSP Implementation on DSK 6713...  
80  
*Heba Ahmed Elsayed (Ain Shams University), Abdelrhman.M. Abotaleb (Cairo University), Eman Mohammed Mahmoud (Modern Academy of Engineering and Technology), and Abdelhalim Zekry (Ain Shams University)*

## Artificial Intelligence

- Machine Learning Techniques to Detect Maliciousness of Portable Executable Files .86.....  
*Akram M. Radwan (University College of Applied Sciences (UCAS))*
- On using AI-Based Human Identification in Improving Surveillance System Efficiency .91.....  
*Eman Alajrami (University of Palestine), Hani Tabash (University of Palestine), Yassir Singer (University of Palestine), and M.-T. El Astal (CTRC, P-ICTRA Gaza, State of Palestine)*
- Graph-Based Fuzzy Logic for Extractive Text Summarization (GFLES) .96.....  
*Mahmoud R. Alfarra (University College of Science and Technology), Abdalfattah M. Alfarra (University College of Science and Technology), and Jamal M. Alattar (University College of Science and Technology)*
- Diagnosis Methods of Skin Lesions in Dermoscopic Images: A Survey .102.....  
*Ihab Zaqout (Al-Azhar University, Palestine)*

## Robotics and Electronic Systems

- Design a non-Invasive Pulse Oximeter Device Based on PIC Microcontroller .107.....  
*Abdelrahman Y. H. Elagha (University College of Science and Technology), Ahmad A. H. EL-Farra (University College of Science and Technology), and Mohanad H. KH. Shehada (University College of Science and Technology)*
- Negative Resistance Feedback Oscillator Design for Internet Over TV (IOTV) Application .113.....  
*Falah Mohammed (An Najah National University), Allam Mousa (An Najah National University), Ahmed Masri (An Najah National University), and Y. A. S. Dama (An Najah National University)*

Design and Build of a Tele-Operated and Robot-Assisted Multi-Material 3D Printer System .118.....  
*Ahmed Issa (Al Azhar University – Gaza, Palestine), Mohammed Elshorafa  
(Al Azhar University – Gaza, Palestine), Mohammad O. A. Aqel (Al Azhar  
University – Gaza, Palestine), Nashat Naim (Al Azhar University –  
Gaza, Palestine), and Dermot Brabazon (Dublin City University,  
Ireland)*

5-DOF Robot Manipulator Modelling, Development and Automation using LabVIEW, Vision Assistant and  
Arduino .124.....  
*Ahmed Issa (Al Azhar University – Gaza, Palestine), Mohammad O. A.  
Aqel (Al Azhar University – Gaza, Palestine), Basel Zakout (Al Azhar  
University – Gaza, Palestine), Abdallah Abu Daqqa (Al Azhar University  
– Gaza, Palestine), Mohammed Amassi (Al Azhar University – Gaza,  
Palestine), and Nashat Naim (Al Azhar University – Gaza, Palestine)*

## **Encryption and Data Communication Protocols**

Encryption Based On Multilevel Security for Relational Database EBMSR .130.....  
*Ahmed Y. Mahmoud (Al-Azhar University-Gaza, Palestine) and Mohammed  
Naji Abu Alqumboz (Al-Azhar University-Gaza, Palestine)*

RAD: Reinforcement Authentication DYMO Protocol for MANET .136.....  
*Rushdi A. Hamamreh (Al-Quds University), Mohammad Ayyad (Al-Quds  
University), and Mohammad Jamoos (Al-Quds University)*

IoT Secure Communication using ANN Classification Algorithms .142.....  
*Tamer S. Fatayer (Al-Aqsa University) and Mohammed N. Azara (Aqsa  
University)*

**Author Index 147**.....