

# **2019 2nd International Conference on New Trends in Computing Sciences (ICTCS 2019)**

**Amman, Jordan  
9 – 11 October 2019**



IEEE Catalog Number: CFP19HAB-POD  
ISBN: 978-1-7281-2883-2

**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:	CFP19HAB-POD
ISBN (Print-On-Demand):	978-1-7281-2883-2
ISBN (Online):	978-1-7281-2882-5

**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)

## Table of Contents

### Track 1: Computer and Network Security

Optimized Multi-Layer Hierarchical Network Intrusion Detection System with Genetic Algorithms .....	1
<i>Pranesh Santikellur, Tahreem Haque, Malek Al-Zewairi, and Rajat Subhra Chakraborty</i>	
Leader Election and Blockchain Algorithm in Cloud Environment for E-Health .....	8
<i>Basem Assiri</i>	
Automotive Cybersecurity: Foundations for Next-Generation Vehicles .....	14
<i>Michele Scalas and Giorgio Giacinto</i>	
NTRU-Like Secure and Effective Congruential Public-Key Cryptosystem using Big Numbers .....	20
<i>Anas Ibrahim, Alexander Chefranov, and Nagham Hamad</i>	
Review: Phishing Detection Approaches .....	27
<i>AlMaha Abu Zuraiq and Mouhammd Alkasassbeh</i>	
Detecting Slow Port Scan using Fuzzy Rule Interpolation .....	33
<i>Mohammad Almseidin, Mouhammd Al-kasassbeh, and Szilveszter Kovacs</i>	
An Approach for Web Applications Test Data Generation Based on Analyzing Client Side User Input Fields .....	39
<i>Samer Hanna and Hayat Jaber</i>	
Achieving Data Integrity and Confidentiality using Image Steganography and Hashing Techniques .....	45
<i>Ahmed Hambouz, Yousef Shaheen, Abdelrahman Manna, Mustafa Al-Fayoumi, and Sara Tedmori</i>	
Detecting Network Anomalies using Machine Learning and SNMP-MIB Dataset with IP Group .....	51
<i>Abdelrahman Manna and Mouhamad Alkasassbeh</i>	
Enhancing Data Protection Provided by VPN Connections over Open WiFi Networks .....	56
<i>Ashraf Karaymeh, Mohammad Ababneh, Malik Qasaimeh, and Mustafa Al-Fayoumi</i>	
A Proactive Design to Detect Denial of Service Attacks using SNMP-MIB ICMP Variables.....	62
<i>Yousef Khaled Shaheen and Mohammad Al Kasassbeh</i>	
An Energy Aware Fuzzy Trust Based Clustering with Group Key Management in MANET Multicasting.....	68
<i>Gomathi Krishnasamy</i>	
Framework for Blockchain Deployment: The Case of Educational Systems .....	74
<i>Saif Kazakze, Eyad Ayoubi, Baraa K. Muslmani, Malik Qasaimeh, and Mustafa Al-Fayoumi</i>	

## **Track 2: Virtual and Electronic Learning**

The JOVITAL Project: Capacity Building for Virtual Innovative Teaching and Learning in Jordan.....	83
<i>Katherine Wimpenny, Arinola Adefila, Alun DeWinter, Valerij Dermol, Nada Trunk Širca, and Aleš Trunk</i>	
The Relation between Individual Student Behaviours in Video Presentation and Their Modalities using VARK and PAEI Results.....	87
<i>Ahmed Fekry, Georgios Dafoulas, and Manal Ismail</i>	
An overview of Digital Forensics Education .....	94
<i>Georgios A. Dafoulas and David Neilson</i>	
Enhancing International Virtual Collaborative Learning with Social Learning Analytics.....	101
<i>Alexander Clauss, Florian Lenk, and Eric Schoop</i>	
Evaluation of Students' Acceptance of the Leap Motion Hand Gesture Application in Teaching Biochemistry.....	107
<i>Nazlena Mohamad Ali and Mohd Shukuri Mohamad Ali</i>	
Designing and Implementing an e-Course using Adobe Captivate and Google Classroom: A Case Study.....	113
<i>Shahd Alia and Thair Hamtini</i>	
The Importance of Institutional Support in Maintaining Academic Rigor in E-Learning Assessment.....	119
<i>Darin El-Nakla, Beverley McNally, and Samir El-Nakla</i>	
Deep Learning Assisted Smart Glasses as Educational Aid for Visually Challenged Students .....	124
<i>Hawra AlSaid, Lina AlKhatib, Aqeela AlOraidh, Shoaa AlHaidar, and Abul Bashar</i>	

## **Track 3: Data Science and Big Data**

DeepDR: An Image Guideddiabetic Retinopathy Detection Technique using Attention-Based Deep Learning Scheme .....	130
<i>Noman Islam, Umair Saeed, Rubina Naz, Jaweria Tanveer, Kamlesh Kumar, and Aftab Ahmed Shaikh</i>	
Mitigating the Effect of Data Sparsity: A Case Study on Collaborative Filtering Recommender System .....	136
<i>Bushra Alhijawi, Ghazi Al-Naymat, Nadim Obeid, and Arafat Awajan</i>	
Visualizing Program Quality – A Topological Taxonomy of Features .....	142
<i>Islam Al Omari, Razan Al Omoush, Haneen Innab, and A. Elhassan</i>	
Improved Swarm Intelligence Optimization using Crossover and Mutation for Medical Classification .....	152
<i>Mais Yasen and Nailah Al-Madi</i>	

Novel Approach towards Arabic Question Similarity Detection .....	158
<i>Mohammad Daoud</i>	
Using K-Means Clustering and Data Visualization for Monetizing Logistics Data .....	164
<i>Hamzah Qabbaah, George Sammour, and Koen Vanhoof</i>	
Content Based Image Retrieval Approach using Deep Learning.....	170
<i>Heba Abdel-Nabi, Ghazi Al-Naymat, and Arafat Awajan</i>	
Data Analytics and Business Intelligence Framework for Stock Market Trading .....	178
<i>Batool AlArmouty and Salam Fraihat</i>	

#### **Track 4: Internet of Things**

Reducing Ambulances Arrival Time to Patients .....	183
<i>Mohammad Eshtayah, Jalal Morrar, Ameer Baghdadi, and Amjad Hawash</i>	
Framework Architecture for Securing IoT using Blockchain, Smart Contract and Software Defined Network Technologies .....	189
<i>Hasan Al-Sakran, Yaser Alharbi, and Irina Serguevskaia</i>	
Security Issues in Wireless Sensor Network Broadcast Authentication .....	195
<i>Asad Raza, Ali Abu Romman, and Muhammad Faheem Qureshi</i>	
Towards an Integration Concept of Smart Cities .....	202
<i>Naoum Jamous and Stefan Willi Hart</i>	
Compression Techniques Used in IoT: A Comparitive Study .....	208
<i>Salam Hamdan, Arafat Awajan, and Sufyan Almajali</i>	

#### **Track 5: Natural Language Processing**

Using Part of Speech Tagging for Improving Word2vec Model .....	213
<i>Dima Suleiman and Arafat A. Awajan</i>	
Applying Ontology in Computational Creativity Approach for Generating a Story .....	220
<i>Lana Issa and Shaikhah Jusoh</i>	
Arabic Document Indexing for Improved Text Retrieval .....	226
<i>Yaser A. M. Al-Lahham</i>	
Evaluation of Question Classification.....	231
<i>Mariam Biltawi, Arafat Awajan, and Sara Tedmori</i>	
Arabic Text Classification of News Articles using Classical Supervised Classifiers .....	238
<i>Leen Al Qadi, Hozayfa El Rifai, Safa Obaid, and Ashraf Elnagar</i>	
Graph-Based Arabic Key-Phrases Extraction .....	244
<i>Dana Halabi and Arafat Awajan</i>	
Arabic Text Keywords Extraction using Word2vec .....	251
<i>Dima Suleiman, Arafat A. Awajan, and Wael Al Etaiwi</i>	

A Deep Learning Approach for Arabic Text Classification.....	258
<i>Katrina Sundus, Fatima Al-Haj, and Bassam Hammo</i>	
Arabic Text Semantic Graph Representation .....	265
<i>Wael Mahmoud Al Etaiwi and Arafat Awajan</i>	
Sentiment Analysis for Arabic Language using Attention-Based Simple Recurrent Unit.....	271
<i>Saja Al-Dabet and Sara Tedmori</i>	
<b>Track 6: Intelligent Systems</b>	
A Novel Medical Image Fusion Algorithm for Detail-Preserving Edge and Feature Extraction .....	277
<i>Fayadh Alenezi</i>	
Classification of Short-Time Single-Lead ECG Recordings using Deep Residual CNN.....	283
<i>Areej Kharshid, Haikel S. Alhichri, Ridha Ouni, and Yakoub bazi</i>	
Identification and Tagging of Malicious Vehicles through License Plate Recognition.....	289
<i>Ahmad Mostafa, Walid Hussein, and Samir El-Seoud</i>	
Cascaded Layered Recurrent Neural Network for Indoor Localization in Wireless Sensor Networks.....	296
<i>Hamza Turabieh and Alaa Sheta</i>	
Learning with Dynamic Architectures for Artificial Neural Networks - Adaptive Batch Size Approach .....	302
<i>Reham Saeed, Rawan Ghnemat, Ghassen Benbrahim, and Ammar Elhassan</i>	
Hybrid Machine Learning Classifiers to Predict Student Performance .....	306
<i>Hamza Turabieh</i>	
Automated Grading for Handwritten Answer Sheets using Convolutional Neural Networks .....	312
<i>Eman Shaikh, Iman Mohiuddin, Ayisha Manzoor, Ghazanfar Latif, and Nazeeruddin Mohammad</i>	
Wrapper-Based Feature Selection for Imbalanced Data using Binary Queuing Search Algorithm .....	318
<i>Thaer Thaher, Majdi Mafarja, Baker Abdalhaq, and Hamouda Chantar</i>	
Self-Organizing Maps for Agile Requirements Prioritization .....	324
<i>Amjad Hudaib and Fatima Alhaj</i>	
A Parallel Face Detection Method using Genetic & CRO Algorithms on Multi-Core Platform .....	329
<i>Mohammad Khanafsa, Ola Surakhi, and Sami Sarhan</i>	
Heart Disease Detection using Machine Learning Majority Voting Ensemble Method.....	335
<i>Rahma Atallah and Amjed Al-Mousa</i>	

Resolving Conflict of Interests in Recommending Reviewers for Academic Publications using Link Prediction Techniques .....	341
<i>Sa'ad A. Al-Zboon, Saja Khaled Tawalbeh, Heba Al-Jarrah, Muntaha Al-Asa'd, Mahmoud Hammad, and Mohammad AL-Smadi</i>	
Reconstructing Colored Strip-Shredded Documents Based on the Hungarians Algorithm .....	347
<i>Fatima Alhaj, Ahmad Sharieh, and Azzam Sleit</i>	
Implementation and Comparative Analysis of Semi-Automated Surveillance Algorithms in Real Time using Fast-NCC .....	
<i>Omer Khan, Nayab Saeed, Raheel Muzzammel, Umair Tahir, and Omar Azeem</i>	
Adaptive Control of Nonaffine Nonlinear Systems by Neural State Feedback .....	360
<i>M. Bahita and K. Belarbi</i>	

### **Track 7: Miscellaneous**

Would It be Profitable Enough to Re-Adapt Algorithmic Thinking for Parallelism Paradigm.....	366
<i>Aimad Eddine Debbi, Abdelhak Farhat Hamida, and Haddi Bakhti</i>	
Affordable and Portable Realtime Saudi License Plate Recognition using SoC .....	372
<i>Loay Alzubaidi, Ghazanfar Latif, and Jaafar Alghazo</i>	
Two Information Systems in Air Transport It is a Short Journey from Success to Failure.....	377
<i>Victor P. Lane, Derar Eleyan, and James Snaith</i>	
Task Scheduling Based on Modified Grey Wolf Optimizer in Cloud Computing Environment .....	382
<i>Abdullah Alzaqebah, Rizik Al-Sayyed, and Raja Masadeh</i>	
Causal Path Planning Graph Based on Semantic Pre-Link Computation for Web Service Composition .....	388
<i>Moses Olaifa and Tranos Zuva</i>	
Accelerating Stochastic Gradient Descent using Adaptive Mini-Batch Size.....	393
<i>Muayyad Saleh Alsadi, Rawan Ghnemat, and Arafat Awajan</i>	