

# **2019 International Conference on Smart Applications, Communications and Networking (SmartNets 2019)**

**Sharm El Sheikh, Egypt  
17 – 19 December 2019**



**IEEE Catalog Number: CFP19P14-POD  
ISBN: 978-1-7281-4276-0**

**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:	CFP19P14-POD
ISBN (Print-On-Demand):	978-1-7281-4276-0
ISBN (Online):	978-1-7281-4275-3

**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

# TABLE OF CONTENTS

<b>APPLYING CONVOLUTIONAL NEURAL NETWORKS FOR IMAGE DETECTION</b> .....	1
<i>Abdel-Fatah Karam ; Mohamed Embaby ; Hazem El-Kady ; Samir Abdel-Hafeez ; George Nabil ; Ammar Mohammed</i>	
<b>TRAFFIC SIGN RECOGNITION USING NEURAL NETWORKS USEFUL FOR AUTONOMOUS VEHICLES</b> .....	9
<i>Jihene Rezgui ; Amal Hbaieb ; Lamia Chaari ; Julien Maryland</i>	
<b>SUSTAINABLE SECURITY FOR INTERNET OF THINGS</b> .....	15
<i>Michele De Donno ; Krzysztof Mateusz Malarski ; Xenofon Fafoutis ; Nicola Dragoni ; Martin Nordal Petersen ; Michael Stübert Berger ; Sarah Ruepp</i>	
<b>ARITHMETIC CODING FOR LENGTH-CONSTRAINED JOINT SOURCE COMPRESSION AND ERROR DETECTION</b> .....	19
<i>Amin Zribi</i>	
<b>PREDICTING CARDIAC ANOMALIES USING PROBABILISTIC MODELS ON HISTORICAL ELECTROCARDIOGRAM DATA</b> .....	25
<i>Asim Darwaish ; Medina Hadjem ; Farid Naït-Abdesselam ; Ashfaq Khokhar</i>	
<b>A NOVEL DATA CLEANSING APPROACH FOR SENSITIVE APPLICATIONS OF WIRELESS SENSOR NETWORKS</b> .....	31
<i>Chafiq Titouna ; Farid Naït-Abdesselam ; Ashfaq Khokhar</i>	
<b>SMART TRAFFIC LIGHT SCHEDULING ALGORITHMS</b> .....	37
<i>Jihene Rezgui ; Mamadou Barri ; Reiner Gayta</i>	
<b>A SMART AUTONOMOUS TOUR GUIDE FOR MUSEUMS</b> .....	44
<i>Abdullah A. Hassan ; Muhubo M. Abdilhakiim ; Samy El-Hennawey</i>	
<b>INCLUDING NONLINEAR SPM AND XPM EFFECTS ON THE OPTICAL MIMO SYSTEMS</b> .....	50
<i>Ichraf Chatti ; Faïçal Baklouti ; Faouzi Chekir ; Rabah Attia</i>	
<b>DESIGN NEW COLLISION RESISTANT HASH FUNCTION FOR BLOCKCHAIN IN V2V COMMUNICATION</b> .....	56
<i>Ammar Ibrahim El Sayed ; Mohamed Helmy Megahed ; Mohamed Hassan Abdel Azeem</i>	
<b>LORA GATEWAY PLACEMENT AT THE UNIVERSITY OF ZULULAND: A CASE STUDY</b> .....	64
<i>Smangaliso Mnguni ; Pragasen Mudali ; Nombuso Sibeko ; Matthew O. Adigun</i>	
<b>VEHICLES CLASSIFICATION AND BRAND RECOGNITION USING CONVOLUTION NETWORK AND NEURAL NETWORKS</b> .....	70
<i>Jihene Rezgui ; Simon Dazé ; Gaya Mehenni</i>	
<b>MANAGEMENT OF SMART WATER TREATMENT PLANT USING IOT CLOUD SERVICES</b> .....	76
<i>Hatem Yousry El Sayed ; Mohsen Al-Kady ; Yasser Siddik</i>	
<b>A VALIDATED MODEL FOR CITIZEN ENGAGEMENT AND SMARTNESS OF CITIES</b> .....	81
<i>Sukaïna Al-Nasrawi</i>	
<b>DEVELOPING SMART SUSTAINABLE CITIES: A VALIDATED TRANSFORMATION FRAMEWORK</b> .....	87
<i>Maysoun Ibrahim</i>	
<b>FROM IEEE 11073 SDC DEVICE SPECIALIZATIONS TO ASSISTIVE SYSTEMS: RULE-BASED DATA ANALYSIS FOR MINIMAL INVASIVE SURGERY</b> .....	92
<i>Martin Kasparick ; Björn Butzin ; Frank Golatowski ; Jonas Pabst ; Hans-Joachim Cappius ; Peter Westerhoff ; Björn Andersen ; Dirk Timmermann</i>	
<b>ENHANCING THE CAPTURE CAPABILITIES OF LORA RECEIVERS</b> .....	99
<i>Phoebe Edward ; Abdullah Muhammad ; Sondos Elzeiny ; Mohamed Ashour ; Tallal Elshabrawy ; Joerg Robert</i>	
<b>URBAN INTELLIGENT NAVIGATOR FOR DRONE USING CONVOLUTIONAL NEURAL NETWORK (CNN)</b> .....	105
<i>Ibrahim G. M. I. Moteir ; Kamarulafizam Ismail ; Fazila M. Zawawi ; Munder M. M. Azhar</i>	
<b>DOWNLINK JOINT PROCESSING FOR NON ORTHOGONAL MULTIPLE ACCESS</b> .....	109
<i>Islam Atef</i>	
<b>IMPLEMENTATION OF CRYPTANALYSIS BASED ON FPGA HARDWARE USING AES WITH SHA-1</b> .....	114
<i>Sara Al-Shara'A ; Raïd Khalid Ibraheem ; Oguz Bayat</i>	
<b>PERFORMANCE ANALYSIS OF OPENSTACK CONTROLLER</b> .....	121
<i>Priyatosh Mandal ; Rekha Jain ; Vaibhav Surwade</i>	

<b>A SECURE BLOCKCHAIN-BASED PRESCRIPTION DRUG SUPPLY IN HEALTH-CARE SYSTEMS.....</b>	<b>126</b>
<i>Bidi Ying ; Wen Sun ; Nada Radwan Mohsen ; Amiya Nayak</i>	
<b>EMPLOYEE READINESS TOWARDS ARTIFICIAL INTELLIGENCE IN SRI LANKAN BANKING CONTEXT.....</b>	<b>132</b>
<i>B. Mathipriya ; I. Minhaj ; L. D. C. P. Rodrigo ; P. Abiyackshmana ; K. A. D. C. P. Kahandawaarachchi</i>	
<b>BATTERYLESS WIRELESS WATER LEAK DETECTION SYSTEM.....</b>	<b>138</b>
<i>Oliver Witham ; Levi Nathan Johnston ; Ming Xiao ; Jiayun Feng ; Norman Zhou ; George Shaker</i>	
<b>THE EFFECTS OF DEMOGRAPHIC VARIABLES ON MASTER DATA QUALITY MANAGEMENT TO IMPROVE SERVICE DELIVERY .....</b>	<b>142</b>
<i>Tshegofatso Evidence Hutang ; Billy Mathias Kalema</i>	
<b>LIGHT IN TILES - IOT INNOVATIVE TRADITIONAL CERAMIC TILES.....</b>	<b>148</b>
<i>F. D. Moita ; Luis Roseiro ; Victor D. N. Santos ; Pedro Amaro ; N. M. Fonseca Ferreira ; João Neves</i>	
<b>BREAKING STRENGTH OF SMART INTERCONNECTED CERAMIC ELEMENTS.....</b>	<b>154</b>
<i>Luis Roseiro ; Pedro Seica ; João Neves ; Fernando Moita ; Fernando Simões</i>	
<b>TOWARDS A SMART FARMING FOR EARLY DETECTION OF FALL ARMYWORM PEST.....</b>	<b>158</b>
<i>Manhougbé Probus A. F. Kiki ; Sèmèvo Arnaud R. M. Ahouandjinou ; Kokou M. Assogba</i>	
<b>COMPARISON OF OPENSTACK ORCHESTRATION PROCEDURES .....</b>	<b>163</b>
<i>Priyatosh Mandal ; Rekha Jain</i>	
<b>GOOGLE TRACES ANALYSIS FOR DEEP MACHINE LEARNING CLOUD ELASTIC MODEL .....</b>	<b>167</b>
<i>Tariq Daradkeh ; Anjali Agarwal ; Nishith Goel ; Jim Kozlowski</i>	
<b>GOP ENCODING STRUCTURE IN H264/AVC FOR VIDEO TRANSMISSION OVER ULTRA WIDE BAND IEEE 802.15.3C.....</b>	<b>173</b>
<i>Asma Ben Abdallah ; Ali Dziri ; Amin Zribi ; Michel Terré ; Fethi Tlili</i>	
<b>COMPARING ENERGY EFFICIENCY OF SPECTRUM SHARING PARADIGMS.....</b>	<b>177</b>
<i>Aaqib Patel ; Mohammed Zafar Ali Khan</i>	
<b>DETECTION OF FALSE DATA INJECTION ATTACKS ON CPS USING CODED COSINE SIMILARITY TESTS .....</b>	<b>182</b>
<i>Yeshwant Manchuri ; Aaqib Patel ; Mohammed Zafar Ali Khan</i>	
<b>CYBER THREATS AND POLICIES FOR INDUSTRIAL CONTROL SYSTEMS .....</b>	<b>188</b>
<i>Mohamed Mesbah ; Marianne Azer</i>	
<b>EFFICIENT HARDWARE/SOFTWARE CO-DESIGN OF ELLIPTIC-CURVE CRYPTOGRAPHY FOR THE INTERNET OF THINGS.....</b>	<b>194</b>
<i>Ahmad Salman ; Samy El-Tawab</i>	
<b>PRIVACY-PRESERVING SMART PARKING SYSTEM USING BLOCKCHAIN AND PRIVATE INFORMATION RETRIEVAL .....</b>	<b>200</b>
<i>Wesam Al Amiri ; Mohamed Baza ; Karim Banawan ; Mohamed Mahmoud ; Waleed Alasmay ; Kemal Akkaya</i>	
<b>AN SD-WAN SOLUTION ASSURING BUSINESS QUALITY VOIP COMMUNICATION FOR HOME BASED EMPLOYEES.....</b>	<b>206</b>
<i>Damian Radcliffe ; Eoghan Furey ; Juanita Blue</i>	
<b>A NEURAL NETWORK-BASED VLC INDOOR POSITIONING SYSTEM FOR MOVING USERS .....</b>	<b>212</b>
<i>Wafaa Sayed ; Tawfik Ismail ; Khaled Elsayed</i>	
<b>EVALUATION OF DEEP LEARNING IN DETECTING UNKNOWN NETWORK ATTACKS .....</b>	<b>218</b>
<i>Ulya Sabeel ; Shahram Shah Heydari ; Harsh Mohanka ; Yasmine Bendhaou ; Khalid Elgazzar ; Khalil El-Khatib</i>	
<b>MODELING AND SCHEDULING WITH DAG USED FOR TASKS IN ME WITH OVP.....</b>	<b>224</b>
<i>Afef Salhi ; Fahmi Ghazzi ; Ahmed Fakhfakh</i>	
<b>PERFORMANCE ANALYSIS OF RANDOM ACCESS CHANNEL PERIODICITY IN THE NB-IOT SYSTEM.....</b>	<b>230</b>
<i>Maha Medhat ; Khaled El-Shafey ; Ali Rashed</i>	
<b>EGYPTIAN CASE STUDY-SALES FORECASTING MODEL FOR AUTOMOTIVE SECTION.....</b>	<b>236</b>
<i>Mahmoud Abdellatif ; Essam M Shaaban ; Karim A. Abu-Raya</i>	
<b>ADDRESSING COLD START CHALLENGES IN RECOMMENDER SYSTEMS: TOWARDS A NEW HYBRID APPROACH .....</b>	<b>242</b>
<i>Nouhaila Idrissi ; Ahmed Zellou ; Oumaima Hourrane ; Zohra Bakkoury ; El Habib Benlahmar</i>	
<b>SECURING DOCUMENT BY DIGITAL SIGNATURE THROUGH RSA AND ELLIPTIC CURVE CRYPTOSYSTEMS.....</b>	<b>248</b>
<i>Nelson Josias Gbètoho Saho ; Eugène C. Ezin</i>	
<b>WIRELESS SENSOR NETWORK AND DEEP LEARNING FOR PREDICTION GREENHOUSE ENVIRONMENTS .....</b>	<b>254</b>
<i>Asmaa Ali ; Hossam S. Hassanein</i>	
<b>Author Index</b>	