

# **2016 9th International Conference on Developments in eSystems Engineering (DeSE 2016)**

**Liverpool, United Kingdom  
31 August – 2 September 2016**



IEEE Catalog Number: CFP1656I-POD  
ISBN: 978-1-5090-5488-6

**Copyright © 2016 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:	CFP1656I-POD
ISBN (Print-On-Demand):	978-1-5090-5488-6
ISBN (Online):	978-1-5090-5487-9

**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

# **2016 9th International Conference on Developments in eSystems Engineering**

## **DeSE 2016**

### **Table of Contents**

<b>Foreword.....</b>	x
<b>Conference Committees.....</b>	xi
<b>Steering Committee .....</b>	xii
<b>Acknowledgements.....</b>	xiii
<b>Keynotes.....</b>	xv

---

### **e-Health & e-Medicine**

How to Fail When Introducing Electronic Technologies into Organisations .....	3
<i>Ken Eason</i>	
Factors Affecting the Move to an eSystems Approach to Remote Care Delivery .....	7
<i>Adam Hoare</i>	
Automatic Feature Learning Method for Detection of Retinal Landmarks .....	13
<i>Baidaa Al-Bander, Waleed Al-Nuaimy, Majid A. Al-Taee, Ali Al-Ataby,     and Yalin Zheng</i>	
Identification and Extraction of New Feature for Zebrafish Discrimination .....	19
<i>Qussay Al-Jubouri, Waleed Al-Nuaimy, Majid Al-Taee, Bayan Al-Saadah,     Hilal Al-Libawy, and Iain Young</i>	
Visual Augmentation Glasses for People with Impaired Vision .....	24
<i>Ali Al-Ataby, Ola Younis, Waleed Al-Nuaimy, Majid Al-Taee, Zain Sharaf,     and Baidaa Al-Bander</i>	
Analysis of Embryonic Malformations in Zebrafish Larvae .....	29
<i>Bayan Al-Saadah, Waleed Al-Nuaimy, Majid Al-Taee, Ali Al-Ataby, Iain Young,     and Qussay Al-Jubouri</i>	
Breast Cancer Detection Using K-Nearest Neighbor Machine Learning Algorithm .....	35
<i>Moh'd Rasoul Al-Hadidi, Abdulsalam Alarabeyyat, and Mohannad Alhanahnah</i>	

Fatigue Detection Method Based on Smartphone Text Entry Performance Metrics .....	40
<i>Hilal Al-Libawy, Ali Al-Ataby, Waleed Al-Nuaimy, Majid A. Al-Taee, and Qussay Al-Jubouri</i>	
Towards Developing Online Compliance Index for Self-Monitoring of Blood Glucose in Diabetes Management .....	45
<i>Ahmad Al-Taee, Anas Al-Taee, Zahra Muhsin, Majid Al-Taee, and Waleed Al-Nuaimy</i>	
The Effects of Premature Birth on Children Education .....	51
<i>Wafaa Mahdi Salih, Abir Jaafar Hussain, Mohammed Khalaf, Janet Lunn, Dhiya Al-Jumeily, Paul Fergus, Timothy Ealeifo, and Hanaa Mahdi Salih</i>	
Development of a Holistic Health Economic Evaluation Tool Leveraging Patient Self-Report .....	56
<i>Faye Prior and Tom Dawson</i>	
Barriers in New Health and Social Care Technology Implementation in the United Kingdom, a Case Study .....	62
<i>Adie Blanchard, Faye Prior, Jack Barton, and Tom Dawson</i>	
Diabetes Digital Coach: Developing an Infrastructure for e-Health Self-Management Tools .....	68
<i>Anthony Winterlich, Iain Stevenson, Andrew Waldren, and Tom Dawson</i>	
Integrated and Scalable Architecture for Providing Cost-Effective Remote Health Monitoring .....	74
<i>Mohamed Al Hemairy, Mohamed Adel Serhani, Saad Amin, and Mahmoud Al Ahmed</i>	
Design of a 0D Image-Based Coronary Blood Flow Model .....	81
<i>Alena Uus and Panos Liatsis</i>	

## **e-Security & e-Forensics**

Mapping Security Requirements of Mobile Health Systems into Software Development Lifecycle .....	87
<i>Majid A. Al-Taee, Waleed Al-Nuaimy, Zahra J. Muhsin, Ali Al-Ataby, and Ahmad M. Al-Taee</i>	
A Compact S-Box Module for 128/192/256-bit Symmetric Cryptography Hardware .....	94
<i>Otávio de Souza Martins Gomes and Robson Luiz Moreno</i>	
Cyber Security Risk Evaluation Research Based on Entropy Weight Method .....	98
<i>T. Hamid, D. Al-Jumeily, A. Hussain, and J. Mustafina</i>	
Adding a Third Dimension to BPMN as a Means of Representing Cyber Security Requirements .....	105
<i>Curtis L. Maines, Bo Zhou, Stephen Tang, and Qi Shi</i>	

A Study into Detecting Anomalous Behaviours within HealthCare Infrastructures .....	111
<i>Aaron Boddy, William Hurst, Michael Mackay, and Abdennour El Rhalibi</i>	
Seamless LTE-WiFi Architecture for Offloading the Overloaded LTE with Efficient UE Authentication .....	118
<i>Ali Saeed Dayem Alfoudi, Gyu Myoung Lee, and Mohammed Dighriri</i>	
Statistical Keystroke Dynamics System on Mobile Devices for Experimental Data Collection and User Authentication .....	123
<i>Noor Mahmood Al-Obaidi and Mudhafar M. Al-Jarrah</i>	
Multimedia File Signature Analysis for Smartphone Forensics .....	130
<i>D. Hamdi, F. Iqbal, T. Baker, and B. Shah</i>	
DuoHide: A Secure System for Hiding Multimedia Files in Dual Cover Images .....	138
<i>Marwa Tariq Al-Bayati and Mudhafar M. Al-Jarrah</i>	
Build Trust in the Cloud Computing - Isolation in Container Based Virtualisation .....	143
<i>Ibrahim Alobaidan, Michael Mackay, and Posco Tso</i>	

## **e-Learning & Creative Technologies**

Serious Gaming for Pharmacy Education: Development of a Serious Games for Teaching Pharmacist Communication and Drug Administration in a Virtual Hospital Setting .....	151
<i>René Tjell Lambertsen, Stephen Tang, Jonathan Davies, and Charles Morecroft</i>	
Scenario Generation with Cellular Automaton for Game-Based Crisis Simulation System .....	157
<i>Pisit Praiwattana and Abdennour El Rhalibi</i>	
Simulation of Area of Interest Management for Massively Multiplayer Online Games Using OPNET .....	163
<i>Sarmad A. Abdulazeez, Abdennour El Rhalibi, and Dhiya Al-Jumeily</i>	
Generating a Novel Scene-Graph Structure for a Modern GIS Rendering Framework .....	169
<i>David Tully, Abdennour El Rhalibi, Christopher Carter, and Sud Sudirman</i>	
Adaptive Cell Classifier for Remote E-Lab Experiments Based on Adaptive Neuro-Fuzzy Inference System .....	175
<i>Verena M. Samuel, Omar M. Shehata, and Elsayed I. Morgan</i>	
HEVC Based Multi-view Video Codec Using Frame Interleaving Technique .....	181
<i>Bruhanth Mallik and Akbar Sheikh Akbari</i>	
E-Learning: Implications for Higher Education Assessment Strategy .....	186
<i>Dilshad Sarwar and Amin Hosseinian-Far</i>	

Best Practice Guidelines for Technology Enhanced E-Learning .....	191
<i>Muthu Ramachandran</i>	
UAVs Deployment in Disaster Scenarios Based on Global and Local Search Optimization Algorithms .....	197
<i>D. G. Reina, S. L. Toral, and H. Tawfik</i>	
An Integrated Machine Learning Approach for Extrinsic Plagiarism Detection .....	203
<i>Muna AlSallal, Rahat Iqbal, Saad Amin, Anne James, and Vasile Palade</i>	
An Intelligent IT System for Readiness of Equipment Capabilities in Flood Risk .....	209
<i>Mohammad Hijji, Rahat Iqbal, Saad Amin, and Wayne Harrop</i>	

## **e-Systems Engineering**

Regularization Based Modified SART Iterative Method for CT Image Reconstruction .....	217
<i>K. V. Arya, Yadunath Pathak, and Shailendra Tiwari</i>	
Features of Reputed Users in eWOM Using Evolutionary Computation .....	223
<i>M. R. Martinez-Torres, S. Toral, M. Olmedilla, and F. J. Arenas-Marquez</i>	
Towards a Canonical Particle Swarm Optimized Direct Least Squares	
Prioritization Method for Ratio Pairwise Comparison: An Application of Mutual Fund Selection .....	228
<i>Kevin Kam Fung Yuen</i>	
A Survey on Urban Traffic Optimisation for Sustainable and Resilient Transportation Network .....	233
<i>Koh Song Sang, Bo Zhou, Po Yang, and Zaili Yang</i>	
Data Traffic Model in Machine to Machine Communications over 5G Network Slicing .....	239
<i>Mohammed Dighriri, Ali Saeed Dayem Alfoudi, Gyu Myoung Lee, and Thar Baker</i>	
Evolutionary Path Planning of an Autonomous Surface Vehicle for Water Quality Monitoring .....	245
<i>M. Arzamendia, D. Gregor, D. G. Reina, S. L. Toral, and R. Gregor</i>	
Complex Event Processing in e-Services .....	251
<i>Alber Fleischmann, Werner Schmidt, and Christian Stary</i>	
The Development of an Images Detection System Based on Extracting the Colour Gradient Co-occurrence Matrix Features .....	260
<i>Ahd Aljarf, Saad Amin, John Filippas, and James Shuttleworth</i>	
Correlation Based Extreme Learning Machine .....	268
<i>Sanyam Shukla, R. N. Yadav, and Lokesh Naktode</i>	
Statistical Analysis Methods for Interdependency Communication in Distributed Systems .....	273
<i>Sahar Badri, Paul Fergus, and William Hurst</i>	

An Adaptive Grouping Technique in a Coevolutionary Model for Retail <i>Munir Naveed</i>	279
Colour Constancy Using K-Means Clustering Algorithm ..... <i>Md. Akmol Hussain, Akbar Sheikh Akbari, and Ahmad Ghaffari</i>	283
Max-RGB Based Colour Constancy Using the Sub-blocks of the Image ..... <i>Md. Akmol Hussain and Akbar Sheikh Akbari</i>	289
A Computational Study into the Influence of Cold Film on Can Combustor	
Annulus Flow ..... <i>A. H. Amal and Dhirgham Alkhafaji</i>	295
A Computational Investigation of a Turbulent Flow over a Backward Facing Step with OpenFOAM ..... <i>Hayder Al-Jelawy, Stefan Kaczmarczyk, Dhirgham AlKhafaji, Seyed Mirhadizadeh, Rob Lewis, and Matt Cross</i>	301
A Robust Feature Selection Algorithm ..... <i>B. Chandra</i>	308

## **Special Session: Smart Sensors and their Applications**

Low-Frequency Capacitive Sensing for Environmental Monitoring of Water	
Pollution with Residual Antibiotics ..... <i>M. Soprani, O. Korostynska, A. Mason, A. Amirthalingam, J. Cullen, M. Muradov, A. Al-Shamma'a, V. Sberveglieri, E. N. Carmona, and G. Sberveglieri</i>	317
X-Ray Fluorescent Method of Heavy Metals Detection in Soils of Mining and Chemical Enterprises ..... <i>Volodymyr Pohrebennyk, Elvira Dzhumelia, Olga Korostynska, Alex Mason, and Mariush Cygnar</i>	323
Detection of Heparin Level in Blood Using Electromagnetic Wave Spectroscopy ..... <i>Keyur H. Joshi, Majida Al-Manasra, Alex Mason, Olga Korostynska, Andrew K. Powell, Montserrat Ortoneda-Pedrola, and Ahmed Al-Shamma'a</i>	329
Operative Control Parameters of Water Environment ..... <i>Volodymyr Pohrebennyk, Olga Korostynska, Alex Mason, and Mariush Cygnar</i>	335
<b>Author Index</b> .....	341