2019 International Multidisciplinary Information Technology and Engineering Conference (IMITEC 2019)

Vanderbijlpark, South Africa
21 – 22 November 2019

IEEE Catalog Number: CFP19MIU-POD
ISBN: 978-1-7281-0041-8

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: CFP19MIU-POD
ISBN (Print-On-Demand): 978-1-7281-0041-8
ISBN (Online): 978-1-7281-0040-1

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
Web: www.proceedings.com

TABLE OF CONTENT

Impact of Application Development in Managerial Skills, Knowledge and Enterprise Architecture amongst SMEs in Western Cape……..1
Moketla Peter Ntsoane, Osden Jokonya

Utilization of Artificial Neural Networks for Estimation of Slant-Path Rain Attenuation…….. 9
Lekhetho Joseph Mpoporo, Pius Adewale Owolawi, Adewumi Oluwatoyin Ayo

Performance analysis of binary search based RFID anti-collision algorithms…….16
Meryle Mvoulabolo, Tebello Mathaba and Marcel Odhiambo

Syntactic Generation of Memorable Passwords…….……..21
Abejide Ade-Ibijola, Blessing Ogbuokiri

Factors Influencing the Adoption of Agile Methodology within SMEs in Cape Town……29
Barrington Bruiners, Osden Jokonya

Fog Orchestrator as an Enabler for Security in Fog Computing: A Review……..…..37
Nhlakanipho C. Fakude, Paul Tarwireyi, Matthew O. Adigun, Adnan M. Abu-Mahfouz

K-Means Clustering of Ontologies Based on Graph Metrics……...…..43
Gideon Koech and Jean Fonou-Dombeu

Automatic Retinal Vascular Network Detection Using Multi-Thresholding Approach Based on Otsu…….50
Temitope Mapayi, Pius Adewale Owolawi

Ear Recognition for young children: What has been done?.....55
Sthembile Ntshangase and Dick Mathekga

Financial Distress Prediction: Principle Component Analysis and Artificial Neural Networks……61
Juliana Adeola Adisa, Samuel Olusegun Ojo, Pius Adewale Owolawi, Agnieta Beatrijs Pretorius

Evaluating the Energy Efficiency of IoT Routing Protocols…….67
Zibuyisile Magubane, Paul Tarwireyi, Matthew O. Adigun

Lecturer's Apprentice: A Chatbot for Assisting Novice Programmers…….……..74
Mohammed Ismail, Abejide Ade-Ibijola

Wi-Fi Enabled Speech Automated Guided Vehicle Using Android and NodeMCU……..82
Jack Madiba, Pius Adewale Owolawi, Temitope Mapayi

A Human Faced Shaped Ultra Wideband Microstrip Patch Antenna with Enhanced Bandwidth…….86
Dharmarajan A., Kumar P., Afullo JO. Thomas

Tutor Experiences with the Use of an Electronic Assessment Tool at the University of Johannesburg……91
Rehana Minty

Photoplethysmography: Light Emitter Diode Wavelength Derivation From the Absorption Spectra of Haemoglobin……..……97
Feukeu E.A., Winberg S.

A Review of Cultural Influence on Technical Acceptance…….……..…103
Fine Masimba, Martin Appiah, Tranos Zuva

Factors that influence the adoption of electronic patients records management systems in South Africa…… ……110
Irene Popela, Tranos Zuva, Martin Appiah

Part of Speech Tagging for Setswana African Language…….……...119
M.A. Dibitso, P.A. Owolawi, S.O. Ojo

Potential Adoption of Blockchain Technology to Enhance Transparency and Accountability in the Public Healthcare System in South Africa……..125
Patrick Ndayizigamiye, Shopee Dube

Decision support framework for the adoption of software development methodologies……..130
Lynette Simelane, Tranos Zuva

Classification of Fanaroff-Riley Radio Galaxies using Conventional Machine Learning Techniques……..……..136
Burger Becker, Trienko Grobler

Factors Inhibiting the Adoption of Applications Driven Business Solutions by SMMEs in the Western Cape……...…144
Khanya Mogane, Osden Jokonya

Information Systems and Network Technologies for Personal Data Cyber Security in Public Health…….…...150
Alexey Zalozhnev, Denis Andros, Vasiliy Ginz and Anatoly Loktionov

Trend Analysis: A Decision Tool in SA Healthcare…….155
Simon G. Abbott and Abejide Ade-Ibijola

A Flow-based IDS for SDN-enabled Tactical Networks……..162
Skhumbuzo Zwane, Paul Tarwireyi, Matthew Adigun

Experimental Approach to Quantifying Synthectic Corn Seed Measurement error Using a Ground Penetrating Radar…….168
Kenneth O.M.Mapoka, Stuart J. Birrell, David J. Eisenmann, Mehar Z. Tekester, Huaiqing Wu

The Effects of Normalisation Methods on Speech Emotion Recognition……...176
Tshephisho Joseph Sefara

A Model for incorporating an Automatic Speech Recognition System in a noisy educational environment……184
Philip Blunt, Bertram Haskins

Socio-Economic Contributions of Mobile Applications in Africa: Impact of Local Mobile Applications…….191
Chinedu Wilfred Okonkwo, Magda Huisman, Estelle Taylor

An ensemble classifier for handling recurring concept……...199
Tinofirei Museba, Fulufhelo Nelwamodo, Khmaies Ouhada

Detection of Malware Using Artificial Neural Networks…….……206
Olufikayo Olowoyo, Pius Adewale Owolawi

Impact of Agile misconceptions towards organizatioin technology competitiveness……212
Mothepane Maria Tshabalala

A distributed control system for software defined wireless sensor networks through containerization……220
Hlabishi Kobo, Adnan Abu-Mahfouz

Decolonizing ICT curricula in the era of the Fourth Industrial Revolution……..226
Anneke Harmse, Ahmed A. Wadee

A creative pedagogy for learner content interactions as work placement experience at Universities of Technology……..236
Rene Van Eck, Annelie Jordan, Ahmed A. Wadee

Impact of I/O workloads on ram performance for virtual systems……242
Khathutshelo Nicholas Thovheyi, Tranos Zuva

Dynamic Feature of the Reserve Margin Space for Broadcast Storm Mitigation in VANETs……248
Feukeu E.A., Winberg S.

Wireless Power Transfer for IoT Devices - A Review…… …..…254
Makhetha Molefi, Elisha Didam Markus, Adnan M. Abu-Mahfouz

FSO Rain Attenuation Prediction Using Non-Linear Least Square Regression…… …..262
Sandra Bazebo Matondo, Pius Adewale Owolawi

A Review of LoRaWAN Simulators: Design Requirements and Limitations…… ……...267
Jaco M. Marais, Adnan M. Abu-Mahfouz, Gerhard P. Hancke

A Survey of Network and Intelligent air polution Monitoring in South Africa…….273
Ntombikayise Koyana, Elisha Didam Markus, Adnan M. Abu-Mahfouz

A Comparison of Strategies for Missing Values in Data on Machine Learning Classification Algorithms……280
Tebogo Makaba, Eustace Dogo

Comparison of Measured and Estimated Rain Attenuation on Earth-Satellite Links in South Africa……..…287
Lekhetho Joseph Mpoporo, Pius Adewale Owolawi

Intellgent controller for a hybrid energy storage system…….292
Maarten van Jaarsveld, Rupert Gouws

A Metaphor-Based Approach for Introducing Programming Concepts……299
Colin Chibaya

A permissioned Blockchain Approach to the Authorization Process in Electronic Health Records…….307
Ryno Adlam, Betram Haskins

Comparison of segmentation methods for the detection of breast cancer using thermal images...315
Nicholas Lennox, Bertram Haskins

Towards the Internet of Things Patterns Dictionary……..323
Vusi Sithole, Linda Marshall

A Metric for Estimating the Difficulty of Programming Problems by Ranking the Constructs in their Solutions…….331
Elsa Kalemba, Abejide Ade-Ibijola

Secure Firmware Updates in the Internet of Things: A survey……..……340
Njabulo S. Mtetwa, Paul Tarwireyi, Adnan M. Abu-Mahfouz, Matthew O. Adigun

User and Micro-grid Energy Optimization in Cooperative MGs……..…347
Andrew Mutsvangwa, Bakhe Nleya, Masimva Gomba, Richard Chidzonga

A Metasynthesis of Solo Software Development Methodologies…….…..353
Sibonile Moyo and Ernest Mnkandla

Jumping Finite Automata for Tweet Comprehension…….……..361
Stephen Obare, Abejide Ade-Ibijola, Onyango Okeyo and Kennedy Ogada

Author Identification from Handwritten Characters using Siamese CNN…….……368
Nkosikhona Dlamini, Terence L can Zyl

Secure the Internet of Things Software Updates with Ethereum Blockchain……374
Njabulo Ntetwa, Paul Tarwireyi, Matthew Adigun

A Combination Part of Speech Tagger using Selected Voting Methods…….380
Annick Griebenouw, Gunther Drevin, Dirk Snyman

Earth Space Rain Attenuation Prediction Using Optimum Algorithm of Artificial Neural Networks……...386
Lekhetho Joseph Mpoporo, Pius Adewale Owolawi

Improving the Organization Technology competitiveness through Effective management of Conflict-Risk within Agile Teams……..392
Mothepane Maria Tshabalala, Lucas Thulani Khoza

Stock Market Behaviour Prediction using Stacked LSTM Networks……400
Samuel Ojo, Pius Adewale Owolawi, Maredi Mphahlele, Juliana Adeola Adisa

Potable Water Quality Monitoring: A Survey of Intelligent Techniques…….405
Neo Ntshako, Elisha Didam Markus, Muthoni Masinde, Adnan M. Abu-Mahfouz

Firmware updates Over the Air mechanisms for Low Power Wide Area Networks: A Review……..…..411
Mompoloki Pule, Adnan M. Abu-Mahfouz

SEVPERF Analysis of Retails Banking Service Performance: A South African Study……..…418
Mathias Mujinga

Device Authentication Schemes in IoT: A Review…….……424
Omphulusa Lucia, Bassey Isong, Naison Gasela, Adnan M. Abu-Mahfouz

A multilingual ASR of Sepedi-English Code-Switched Speech for Automatic Language Identification…….…….430
Koena Ronny Mabokela

A Message Passing Xset for Path Finding Robotic Devices…….……..…438
Colin Chibaya

Implementation Of Iterative Learning Control On A Pneumatic Control Valve……...…….447
James Rwafa and Farzad Ghayoor

An investigation into electronic vaccination cards for minors in Gauteng, South Africa…..…452
Wesley Moonsamy, Shawren Singh

Analysis of LoRa/LoRaWAN Challenges: A Review…….…….…..458
Lesego Ntseane, Bassey Isong

RPL-Based on Load Balancing Routing Objective Functions for IoTs ub Distributed Networks…….…463
Zibuyisile Magubane, Paul Tarwireyi, Adnan M. Abu-Mahfouz, Matthew O. Adigun

TalkSQL: A Tool for the Synthesis of SQL Queries from Verbal Specifications…….…..…N/A
George Obaido, Abejide Ade-Ibijola, Hima Vadapalli

A Hybrid RSA-DH cipher for Signed Encrypted Messages……..…479
Patience Mpofu, Colin Chibaya, Taurayi Rupere

Visual Simultaneous Localization and Mapping System in a Noisy Static Environment……..485
Jabulani k. Makhubela, Tranos Zuva, Olusanya Yinka Agunbiade

Author Index…….……..491