2017 IEEE AFRICON

Cape Town, South Africa
18 – 20 September 2017

Pages 1-810

IEEE Catalog Number: CFP17AFR-POD
ISBN: 978-1-5386-2776-1

Copyright © 2017 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:	CFP17AFR-POD
ISBN (Print-On-Demand):	978-1-5386-2776-1
ISBN (Online):	978-1-5386-2775-4
ISSN:	2153-0025

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 Contents

Special Sessions **1**

2 IEEE Special Sessions

IEEE Women in Engineering N/A

7 The 2nd Developing Countries Robotics Forum

Artificial Intelligence, Optimization and High Performance Computing **8**

9 High Impedance Fault Detection Technique based on Discrete Wavelet Transform and Support Vector Machine In Power Distribution Networks.
Katleho Moloi, Jaco Jordaan, Yskandar Hamam

15 Short time traffic flow identification and prediction at road junctions, using Recurrent Multilayer Perceptron
Bemnet Wondimagegnehu, Getachew Alemu

21 Insulator Condition using Local Binary Patterns Combined with Support Vector Machines
Usiholo Iruansi, Jules-Raymond Tapamo, Innocent Davidson

26 Human Age Estimation Using Multi-Frequency Biologically Inspired Features (MF-BIF)
Raphael Angulu, Jules-Raymond Tapamo, Aderemi O. Adewumi

32 Motion-based Moving Object Detection and Tracking using Automatic K-means
Arghavan Keivani, Jules-Raymond Tapamo, Farzad Ghayoor

38 Regulating Group Cognitive Conflicts using Intelligent Agents in Collaborative M-Learning
Stephen Njenga, Robert Oboko, Elijah Omwenga, Elizaphan Muuro

44 Application of Non-Dominated Sorting Genetic Algorithm (NSGA-II;) in Siting and Sizing of Wind Farms and Facts Devices for Optimal Power Flow in a System
Mohammad R Aghaebrahimi, Reza Kazemi Golkhandan, Sajjad Ahmadnia

51 A Certification Authority For The Kenyan Research Community
Ronald Osure, Peter Muia, Meoli Kashorda

55 Extending Moodle Grouping Functionality Using Artificial Intelligent techniques
Elizaphan Maina, Robert Oboko, Peter Wagacha

59 Bringing Sequential Feature Explanations to Life
Tshepiso Mokoena, Ofentswe Lebogo, Asive Dlaba, Vukosi Marivate

65 Finding optimal bass guitar fingerings
Toky Hajatiana Raboanary, Fanaja Harianja Randriamahenintsoa, Heriniaina Andry Raboanary, Tantely Mahefatiana Raboanary, Julien Amédée Raboanary

72 A Descriptive Analytics Tool for Improving Project Human Resource Management: The importance of Discerning a Project Team Member's Sentiments
Robert Hans, Ernest Mnkandla

Biomedical Engineering, Nanotechnology - Engineering Applications and Health **77**

78 Structural entropy based fuzzy partitioning metod for finding polyps on colocsopic images
Szilvia Nagy, Ferenc Lilik, Laszlo T. Koczy

83 A low-cost potentiostat for point-of-need diagnostics
Petrone H. Bezuidenhout, Suzanne Smith, Kevin J. Land, Trudi-Heleen Joubert

88 Human Feet Tracking in Arranging the Navigation of a Robotic Rollator
Tsholofelo D. Modise, Nico Steyn, Yskandar Hamam

94 A novel expert system for the prediction of accurate multiple sequence alignment and phylogenetic tree construction algorithms
Fanaja Harianja Randriamahenintsoa, Toky Hajatiana Raboanary, Heriniaina Andry Raboanary, Julien Amédée Raboanary

100 A Matlab/Simulink Framework for real time Implementation of Endogenous Brain Computer Interfaces
Yves Matanga, Karim Djouani, Anish Kurien

Communication and Signal Processing **106**

107 Solar power enabled Analog-only Small cell Unit with Millimeter-Wave Wireless Backhaul for Mobile Communication System
Simone Maier, Heinz Schlesinger, Günter Kaltbeitzel, Stefan Wörner, Andreas Pascht, Thierry E. Klein

110 Gain of Spatial Diversity with Conjoint signals
Peter Akuon, Hongjun Xu

115 Performance Analysis of Block Error Rate for SIM-FSO System With Spatial Diversity Over Gamma-Gamma Fading and Pointing Error Channel
Kehinde Odeyemi, Pius Owolawi, Viranjay Srivastava

121 Bit-level Pipelining for Highly Parallel Turbo-Code Decoders: A Critical Assessment
Stefan Weithoffer, Kira Kraft, Norbert Wehn

127 Variable Forgetting Factor - Modified RLS based-Iterative Channel Estimation for OFDM-IDMA Systems
Olutayo Oyeyemi Oyerinde

133 4D Light-Field Models for View Interpolation
Micheale Hadera Tekulu, Kartic Subr

139 Cognitive radio DAB MAC protocol performance using a CR specific simulator and software defined radio
Coert Loubser, Theo Swart

145 Cancellation of Colocated Allied Jamming Signals in Communication Receivers
Jason Bonarius, Johann de Swardt

149 Parametric Linear Time Delay Models and Stability Analysis for Action-Perception Behavior of Human Subjects
Wendwosen Bellete Bedada

155 Firefly Algorithm based Power Control in Wireless TV White Space Network
Kennedy Ronoh, George Kamucha, William Okelo-Odongo, Thomas Olwal, Tonny Omwansa

161 Adaptive Spectrum Aggregation for Opportunistic Resource Management in Multichannel Networks
Chabalala S. Chabalala, Fambirai Takawira

167 A Low Complexity Encoder Construction for Systematic Quasi-Cyclic LDPC Codes
Yuval Genga, Olayinka Ogundile, Olutayo Oyerinde, Jaco Versfeld

171 Improving the Decoding Performance of the PTA Algorithm for RS Codes Through the Extension of the Parity Check Matrix.
Yuval Genga, Olutayo Oyerinde, Jaco Versfeld

175 Performance of ML-Based Carrier Frequency Offset Estimation in CO-OFDM Systems
Muyiwa Balogun, Olutayo Oyerinde, Fambirai Takawira

181 Routing Multiple Description Video Over NLOS Small Cell backhaul
Bessie Malila, Olabisi Falowo, Neco Ventura

187 Comparison and Analysis of Massive MIMO Linear Precoding Schemes in the Downlink
Emmanuel Mukubwa, Oludare Sokoya, Dimov Ilcev

192 Energy Efficient User Association Scheme in Cellular Machine to Machine Communications
Michael E. Tarerefa, Olabisi E. Falowo, Neco Ventura

198 The Performance of Feature-Based Classification of Digital Modulations under varying SNR and Fading Channel Conditions
Leilanie Uys, Marcel Gouws, Jurgens Strydom, Albert Helberg

204 delay Minimization In Spectrum Sensing In Cognitive Radio Networks
Joseph Tlouyamma, Mthulisi Velempini, Sabelo Dlamini

209 An Ordinal Direction Driven Gradient-Based RGBW CFA Demosaicking Technique using a Bayerisation Process and Polyomino Theory
Kinyua Wachira, Elijah Mwangi, Gwanggil Jeon

215 An Exponential Based Packet Scheduling Scheme for Real Time Traffic in Satellite LTE Networks
Gbolahan Aiyetoro, Fambirai Takawira

221 Comparative Study of TOA Based Emitter Deinterleaving and Tracking Algorithms
Kaveer Manickchand, Jurgen Strydom, Amit Mishra

227 Effects of Lower Sampling Interval on Rainfall Queue Characteristics over Radio Links in South Africa
G.N Mazibuko, T.J Afullo, A.A Alonge

232 Narrowband Signal Detection in OFDM Systems Using Spectral Shaping Techniques
Martin Trollip, Khmaies Ouahada, Toshiaki Imoto

238 Entropy Estimation and Entropy-based Encoding of Written Amharic Language for Efficient Transmission in Telecom Networks
Tsegamlak Debella, Dereje Woldegebreal

245 Digital Dividend and its Opportunities for Long Term Evolution Mobile Network:The Case of Ethiopia
Amare Kassaw Yimer, Zemene Matewos, Dereje Hailemariam Woldegebreal

251 Bimodal Biometrics for Efficient Human Recognition Using Wavelet, Principal Component Analysis and Artificial Neural Network
Bisrat Derebssa Dufera, Ashenafi Zebene Woldaregay

256 Incentive/Reward Based Relay Selection for Device to Device Communication
Uyoata Uyoata, Mqhele Dlodlo

262 Effect of OFDM Signal Structure and Subcarrier Modulation on the Reduction of the Signal Peak Power
Stephen Kiambi, Elijah Mwangi, George Kamucha

267 Distributed spectrum sensing for cognitive radio systems using graph theory.
Mduduzi Hlophe, Sunil Maharaj, Soumaya Hamouda

273 MANET Cognitive Radio realtime Testbed for Dynamic Spectrum Access
Piotr Gajewski, Jerzy Lopatka

279 Quasi-Birth-and-Death Model for Queuing based Cooperative Cognitive Networks
Khansa Deb, Soumaya Hamouda, Babatunde Awoyemi, B.T Maharaj

285 Mobile Data Traffic Forecasting in UMTS Networks Based on SARIMA Model: The Case of Addis Ababa, Ethiopia
Samuel Medhn Frdu, Bethelhem Seifu Shawel, Amel Salem Omer, Dereje Hailemariam Woledegbreal

291 An Optical Robotic Communication Scheme: The Effect of Linearly Polarised Modes in Bionic Signal Propagation
Chiemela Onunka, Glen Bright

297 Performance Monitoring of Cognitive Radio Mobile ad hoc Network with Dynamic Spectrum Access
Jerzy Lopatka, Piotr Gajewski, Krzysztof Malon, Jaroslaw Krygier

303 Investigation of the Effects on Embedded Watermarks under Image Manipulations
Nilesh Moti, Theo Swart

309 A Robust Video Watermarking Approach based on a hybrid SVD/DWT Technique
Vincent Adul, Elijah Mwangi

314 Choosing an Integrated Radio-frequency Module for a Wildlife Monitoring Wireless Sensor Network
Jonathan Wotherspoon, Riaan Wolhuter, Thomas Niesler

320 Enhanced Congestion Management In Enhanced Congestion Management In OBS Networks
Masimba Gomba, Bakhe Nleya

325 Model Analysis of Dynamic Priority Segmented Burstification and Deflection Routing
Hudson Sibanda, Bakhe Nleya

332 A Generalized Analysis of Attenuation-Precipitation Time Lapse Events on Earth-Satellite Microwave Links
Babajide Afolayan, Thomas Afullo, Akintunde Alonge

336 A Study of Spatial Media-Based Modulation using RF Mirrors
Babatunde S. Adejumobi, Narushan Pillay, Stanley H. Mneney

342 Modeling Freezing Height Level for Satellite Link Communication: Durban, South Africa
Elijah O. Olurotimi, Dare Sokoya, Joseph S. Ojo, Pius Owolawi

348 An Access Optimization Approach for FFH-OCDMA System's Fiber Bragg Gratings Encoder
Samuel Nlend, Theo Swart, Bhekisipho Twala

354 Investigating a Visible Light Communication Channel with an LED Transmitter and a Smartphone Receiver
Thulani Fuzile, Reolyn Heymann

359 Power allocation and user selection in multi-cell massive MIMO systems.
Paddington Chiguvare, Fambirai Takawira

365 Efficient RAT-Selection for Group Calls using Intuitionistic Fuzzy TOPSIS in Heterogenoeus Wireless Networks
Udita Paul, Olabisi Falowo

371 Call Admission Control for Rain-Impacted Multimedia Satellite Networks
Olugbenga Emmanuel Imole, Tom Walingo

377 On the Performance of the BLMS Adaptive Filter based on Distributed Arithmetic
Tokunbo Ogunfunmi, Avinash Changavi

384 Machine Learning using Neural Networks in Digital Signal Processing for RF Transceivers
Patrick Jueschke, Georg Fischer

391 Aesthetic Surgery Induced Transformation Face Insensitive Features: The Medical and Theoretical Standpoint
Chollette Olisah, Mmaduabuchi Okpala, Adeyemi R. Ikuesan

Control and Automation **397**

398 Lights-Out Process Control – Analysis and Framework
Laurentz Olivier, Ian Craig

404 A Survey on the Degree of Automation in the Mineral Processing Industry
Laurentz Olivier, Ian Craig

410 Diesel Engine Optimisation, with Emissions Constraints, on a Prescribed Driving Route
Gareth Pease, David Limebeer, Peter Fussey

416 A Low Cost Testbed and Test-Design Methodology for Nanosatellite Sub-/Systems
Yaseen Zaidi, Robert van Zyl

424 Enhanced Modified Smith Predictor For Higher Order Stable Processes
K.V.Lakshmi Narayana, Wendwosen Bellete Bedada, Kena Likassa Nefabas

430 Towards Explicit PID Control Tuning using Machine Learning
Andrew Zulu

434 Gain selection criterion for the swing-up control of the Acrobot using collocated partial feedback linearisation
Ricardo Galhardo De Almeida, Otis Nyandoro

440 Performance Analysis of Fractional-Order PID Controller for a Parabolic Distributed Solar Collector
Shahrazed Elmetennani, Ibrahima Ndoye, Khaled Nabil Salama, Taous-Meriem Laleg

446 Overview of Power Aware -RWA in Optical Backbone Supported Networks
Richard Chidzonga, Bakhe Nleya

450 An Overview on Innovative Mechatronic Actuators Based on Smart Materials
Gianluca Rizzello, Leonardo Riccardi, David Naso, Biagio Turchiano, Stefan Seelecke

456 A PD Regulator to Minimize Noise Effect Using a Minimal Variance Method for Soft Landing Control of an Electromagnetic Valve Actuator
Paolo Mercorelli, Theo Van Niekerk, Oleg Sergiyenko

461 Autonomous Control Strategy Creation for Building Energy Management
Gerhard Zucker, Stefan Kollmann

467 Design of Direct Adaptive Controller for a Half-Car Suspension System
Jimoh O. Pedro, Nyiko Baloyi

473 Wireless sensor/actuator device configuration by NFC with secure key exchange
Bernd Klauer, Jan Haase, Dominik Meyer, Marcel Eckert

e-Health, ICT4D **479**

480 Mobile Training in Micro Business: Design Science Research for Frugal Innovation.
William Gomera, George Oreku, Mikko Apiola, Jarkko Suhonen

486 ICT for Informal Workers in Sub-Saharan Africa: Systematic Review and Analysis
Nasibu Mramba, Joel Rumanyika, Mikko Apiola, Jarkko Suhonen

492 A Comparison of Three Architectures Supporting Mobile Text-Based Mathematics Tutoring
Laurie Butgereit

497 Mobile Technology for Women Entrepreneurs in Iringa, Tanzania: User requirements and Architectural Design
Alsen Florian Kapinga, Calkin Suero Montero, Esther Rosinner Mbise

504 The Evaluation of e-Government Implementation: A case study of the Lesotho Company Registry System
Lebohang Rammea, Sara Grobbelaar

512 Intelligent Mobile Application for Ebola Virus Disease Prognosis
Solomon Sunday Oyelere, Danjuma K. Joro, Sunday A. Olaleye, Elisha O. Sunday

518 A Predictive Model for Optimizing Acceptance and Use of mHealth Interventions in Low-Resource Settings: A Case of Mamacare Prototype
Stephen N. Mburu

524 Physical Activity Recognizer based on Multimodal Sensors in Smartphone for u-lifecare Services
Muhammad Fahim, Asad Masood Khattak, Saiqa Aleem, Haseena Al Katheeri

530 Adoption of mhealth and usability challenges in mhealth applications in Kenya
Paul Okanda, Eric Kariuki

536 Factor Subset Selection for Predicting Sustainability of a Telecentre Using Case-based Reasoning
Boyce Sigweni, Mmoloki Mangwala, Daniel Ayoung

542 Network Performance Analysis of the Television White Space (TVWS) Connectivity for Telemedicine: A Case for Botswana
Kagiso Ndlovu, Zablon Mbero, Carrie Kovarik, Arif Patel

Electromagnetics, Antennas and Optics **548**

549 A Comparison between Mathematical Tools for Analyzing FSO Systems over Gamma-Gamma Atmospheric Channel
Kehinde Odeyemi, Pius Owolawi, Viranjay Srivastava

555 W-band Capacitively Loaded Slow-Wave Transmission Line Phase Shifter in 130nm CMOS
Johannes Jacobus Petrus Venter, Tinus Stander

559 Tunable Bandstop Resonator based on Dual Behavior Resonator Principle
Benjamin Potelon, Cedric Quendo, Eric Rius, Jean-Francois Favennec

563 Comparing Baseband and Intermediate Frequency FMCW Radar Receivers
Bernard Meyer, Johann de Swardt, Paul van der Merwe

569 An Efficient Design Workflow of a Compact Ridged Waveguide Filter
Theunis Beukman

574 Power control of a domestic microwave oven
J.P. van der Merwe, J.B. De Swardt

579 Rainfall Rate Prediction based on Artificial Neural Networks For Rain Fade Mitigation over Earth-Satellite link
Mary N Ahuna, Thomas J Afullo, Akintunde A Alonge

585 Implementation of a GNU Radio and Python FMCW Radar Toolkit
Themba Mathumo, Theo Swart, Richard Focke

591 Jammer Signal Effectiveness Against a Conical-Scan Missile Seeker
Tsholofelo M. Malatji, Warren P. du Plessis

597 Influence of AC Interference on the Cathodic Protection Potentials of Pipelines: Towards a Comprehensive Picture
Thabane H. Shabangu, Purva Shrivastava, Bolanle T. Abe, Kazeem B. Adedeji, Peter Olubambi

603 Prediction of Electromagnetic Wave Attenuation in Dust Storms Using Mie Scattering
Abdulwaheed Musa, Babu Paul

609 Stable dual wavelength erbium doped fibre laser
Clarence Mthukwane, Michael Grobler

614 Resonant Characteristics of the transmission line compensated with the Static Synchronous Series Compensator
Mahlomola Masenkane, Rudiren Pillay Carpanen

620 Implementation of active Q-switching based on a modulated fiber Fabry–Perot filter in Linear Cavity Erbium doped fiber laser
kaboko Jean-Jacques Monga, Johan Meyer, Rodolfo Martinez Manuel

625 Higher-Order Characteristic Basis Functions for Antenna Array Analysis with the MoM in 2D
Keshav Sewraj, Matthys M. Botha

630 The Design of an Integrated Diplexer-Power Divider Based on Dual-Band Impedance Transformers and a Five-Port Power-Divider
Ayman Al-Zayed, Mohammed Kourah

Electronic Devices and Circuits **633**

634 Deposition of ZnO nanoparticles for thin-film transistors by doctor blade process
Julia Reker, Thorsten Meyers, Fábio Vidor, Ulrich Hilleringmann

639 Integration of Electronics and Photonics on Monolithic Silicon to Improve the Performance of Conventional Electronics
Hagos Gebreyesus, Getachew Alemu

644 Self-aligned ZnO nanoparticle-based TFTs for flexible electronics
Fábio F. Vidor, Thorsten Meyers, Julia Reker, Gilson I. Wirth, Ulrich Hilleringmann

649 Low-Power Bulk-Driven Rail-to-Rail Comparator in 130 nm CMOS Technology
Lukas Nagy, Daniel Arbet, Martn Kovac, Viera Stopjakova

653 Optimising Energetic Porous Silicon Performance
Monuko du Plessis

657 Inkjet-Printed Conductive Features For Rapid Integration Of Electronic Circuits In Centrifugal Microfluidics.
Jené Kruger, Petroné Bezuidenhout, Trudi-Heleen Joubert

664 CMOS in-pixel optical pulse frequency modulator
Nicolaas Nel, Trudi-Heleen Joubert, Monuko Du Plessis

671 High-resolution capacitance-frequency converter for biosensor applications
Ikraam Ghoor, Petroné Bezuidenhout, Trudi Joubert

Engineering Management and Education **675**

676 Re-inventing Postgraduate Level Teaching and Learning in Nanoelectronics
Mladen Bozanic, Saurabh Chaturvedi, Saurabh Sinha

682 Selection process for Commercial-off-the-Shelf products used as defence equipment
Sonia Mathopo, Annlize Marnewick

688 A Raspberry-Pi Centred Quasi-Flipped Learning Model to Trigger Creative-Thinking in Electrical Engineering Students
Kinyua Wachira, Heywood Ouma Absaloms

694 Reflecting on the balance between theory and practical grades of engineering students – A case study
Arthur James Swart, Lienie Olwagen, Cameron Greyling, Nicolaas Luwes

701 Integration of a robotics programme into a South African secondary school curriculum: A case study
Michael Ettershank, Hannelie Nel, Sune Von Solms

707 Value Co-Creation in Entrepreneurial Ecosystems: Learnings from a Norwegian perspective
Chipo Ngongoni, Sara Grobbelaar

714 Internship Program to Improve Learners' Skills at Technical High Schools in South Africa
Michelin Della Tamin, Johan Meyer

720 Benefits of a Properly Managed Engineering Work Integrated Learning Internship: a case study
Michelin Della Tamin, Johan Meyer

725 Electricity load management potential based on the behaviour of consumers in the South African residential sector
Morne Begemann, George Thopil, Michal Chudy

731 Influence of Social Personalization on Performance in Group Learning
Betty Mayeku, Dieter Hogrefe, Franklin Wabwoba

736 Offline-Enabled Web-based E-Learning for Improved User Experience in Africa
Jan Renz, Ahmed Shams, Christoph Meinel

743 Application Of Matlab For The Planar Displacement Analysis Of Palm Kernel Shell Reinforced Brake Lining
Romeo S Fono-Tamo, Jen Tien-Chien

748 Design and Implementation of an RFID Based Smart Attendance Register
Ignace Toudjeu, Prosper Sotenga

752 The Ribbon Microphone A Teaching Aid for Low Frequency Electromagnetic Education
Marius van Wyk, Petrie Meyer

758 e-Readiness in South African Higher Education: A Delphi study
Kasandra Pillay, Louwrence Erasmus

764 A review of risk management techniques and challenges in harbour and port expansions
Nomaswazi Mathuthu, Hannelie Nel, Annlize Marnewick

770 STEM Project Based Learning: Towards improving secondary school performance in mathematics and science
Sune von Solms, Hannelie Nel

776 An analysis on the marketing of engineering services for the cement manufacturing industry in Sub-Saharan Africa
Johan A.M. Meyer, Louwrence Erasmus

782 Assessing the Effect of Bidding Strategy of an Electric Vehicle Parking Operator (EVPO) in the Day-Ahead and Real-Time markets on the Power System Reliability
Mohammad R Aghaebrahimi, Hossein Taherian

788 Exploring Students and Teachers Activities, Experiences and Impact of Opón Ìmò Mobile Learning Device on Teaching and Learning
Ismaila Sanusi, Solomon Oyelere, Sunday Olaleye, Jarkko Suhonen, Adekunle Otunla

794 Development of a Speech-enabled Basic Arithmetic m-Learning Application for Foundation Phase Learners
Tumisho Billson Mokgonyane, Tshephisho Joseph Sefara, Phuti John Manamela, Madimetja Jonas Manamela, Thipe Isaiah Modipa

800 Impact Assessment to measure the success of implementation of rural community engagement projects. A Case Study
Rene Naidoo, Johan Meyer

806 Development of an Industry-Tailored Telecommunications Engineering Study Program Approaches, Experiences and Insights from Ethiopia
Dereje H. Woldegebreal, Beneyam B. Haile, Edward Mutafungwa, Jyri Hämäläinen

811 A Collaborative Approach for Local Training on Contemporary Mobile Technologies in Eritrea
Edward Mutafungwa, Jyri Hämäläinen, Samuel Tewelde, Rediet Kifle, Teklay Tesfazghi, Andrés Moreno, Marcus Duveskog, Ilkka Jormanainen

817 Conflict Management in Projects
Ajibola Yusuf, Jan Harm C Pretorius

824 Comparison of Informal Settlement Electrification: A Case Study at Seaview, Eastern Cape, South Africa
Thulisa Tshabeni, Peter Freere

Mobile and Cloud Computing, Software Engineering and Information Systems **830**

831 Volume of Signaling Traffic Reaching Cellular Networks from Mobile Phones
Isaac Nyabisa Oteyo, Engineer Bainomugisha

837 Parametric Modeling of Operational Success Factors in E-commerce and M-commerce
Lakshmi Narasimhan, Suryakanthi Tangirala, Srini Ramaswamy

843 Disruptive Technologies and IT decision making in an agile business environment
Rajan Padayachee, Alta Van Der Merwe, Machdel Matthee

849 Classification and Evaluation of Privacy Preserving Data Mining: A Review
Aobakwe Senosi, George Sibiya

856 ICT for Renewable Energy Integration into Smart Buildings: IoT and Big Data Approach
Mohamed Riduan Abid, Rachid Lghoul, Driss Benhaddou

862 An Evaluation Of The Effectiveness Of Cognitive Radio Ad Hoc Networks Routing Protocols
Lerato Ramahlapane Moila, Mthulisi Velempini

867 Privacy Enhancing National Identification Card System
Eric Kuada, Isaac Wiafe, Daniel Addo, Emmanuel Djaba

873 Optimization of Virtual Resources Allocation in Cloud Computing Environment
Samson B. Akintoye, Antoine Bagula

881 Towards a Mobile Education Tool for Higher Education Teachers: A User Requirements Definition
Godfrey Isaac Mwandosya, Calkin Suero Montero

888 Open Data Industry Connections
David Hislop

894 An IMS Subscriber Location Function for OpenBaton - a standards based MANO Environment
Mosiuoa Tsietsi, Tapiwa Chindeka, Alfredo Terzoli

900 Developing A Customer Connectivity Model For Electrical Utilities
Avarn Kooblal, Yarish Brijmohan

905 Challenges when bringing IoT into Industrial Automation
Tomas Lennvall, Mikael Gidlund, Johan ÅKerberg

911 Contextualizing User Centered Design with Agile Methods in Ethiopia
Degif Teka, Yvonne Dittrich, Mesfin Kifle

917 Opportunistic Rescue Network for Disaster Management
Eric Kuada, Boateng Bannerman

923 Cmcd: A Data Warehouse Modeling Framework Based On Goals And Business Process Models
Houda Chakiri, Mohammed El Mohajir, Nasser Assem

929 Users Experience of Mobile Money in Nigeria
Sunday Olaleye, Ismaila Sanusi, Solomon Oyelere

935 Avoiding Consistency and Update Latency Problem in Lazy Master-Master Replication Using a Coordinator Architecture
Kifle Kifle, Ayalew Habtie, Tirukelem Mekuria, Aklile Fantahun

938 An insight into Africa's country-level latencies
Josiah Chavula, Amreesh Phokeer, Agustin Formoso, Nick Feamster

945 Energy Efficient Object Detection on the Mobile GP-GPU
Fitsum Assamnew Andargie, Jonathan Rose, Todd Austin, Valeria Bertacco

951 A Big Data Architecture For Learning Analytics In Higher Education
Fezile Matsebula, Ernest Mnkandla

957 Effect of Technical Issues and Soft Issues Towards Team Peformance and Project Success
Emmanuel Mtsweni

963 Logistic regression analysis of information and communication technology projects: a focus on computer networking projects
Tavengwa Masamha, Ernest Mnkandhla, Absalom Jaison

968 Towards the Development of a Culture Aware Reference Architecture for Mobile Technology A Tools and Methodology Perspective.
Galamoyo Male, Colin Pattinson, Ebrahim Shaghouei

974 Study of the US Road Network based on Social Network Analysis
Elie Ngomseu Mambou, Samuel Nlend, Harold Liu

979 Implementing a Medical Record System with Biometrics Authentication in E-Health
Ambrose Azeta, Da-Omiete Iboroma, Victor Azeta, Emmanuel Igbekele, Deborah Fatinikun, Ebuka Ekpunobi

984 Moving from Web-of-Things to Voice-of-Intelligent-Things in e-Campus
Ambrose Azeta, Emmanuel Igbekele, Victor Azeta

Power and Energy - Renewable Energy, Smart City and Smart Grid **990**

991 Voltage Profile Enhancement in Low Voltage 11/0.4kV Electric Power Distribution Network Using Dynamic Voltage Restorer under Three Phase Balance Load
Taiwo Patrick Ogunboyo, Remy Tiako, Innocent E Davidson

997 Impact of demand profiles on grid-interactive photovoltaic systems in Bloemfontein: A case study
Kanzumba Kusakana

1003 Hybrid Power Systems for GSM and 4G Base Stations in South Africa
Emmanuel Balogun, Pius Owolawi, Viranjay Srivastava

1009 Mass Production of Magnesium Silicide as a TEG Material
Marcel Schönhoff, Ulrich Hilleringmann, Johannes de Boor

1014 Visualising the effect of different tilt angles on the switch-on time of small PV modules using a simplified measuring approach
Arthur James Swart

1020 Modelling Time-Series Solar Hot Water Load Profile Prediction Using Radial Basis Function Neural Network
Mpumelelo Mlonzi, Olawale. M. Popoola, Josiah. L. Munda

1026 Crowbar-less ride through of asymmetrical grid faults with DFIG based WECS
Andreas Uphues, Kilian Nötzold, Ralf Wegener, Stefan Soter

1032 Effect on energy supply contribution by incorporating rooftop photovoltaic systems within the City of Johannesburg
Archford Bobo, Jan-Harm Pretorius, Johan Enslin

1038 Hybrid energy system for low-income households
O.M. Babatunde, J.L. Munda, Y. Hamam

1043 Transformer Condition Assessment for Maintenance Ranking: a Comparison of three Standards and Different Weighting Techniques
Irungu Kimani, Akumu Oriedi, Munda Lange

1049 A survey for service selection approaches in dynamic environments with big data
Lindelwe Manqele, Louis Coetzee, Mqhele Dlodlo, George Sibiya

1055 On Ground Potential Rise Presented by Small and Large Earth Electrodes Under Lightning Conditions
Pieter H Pretorius

1061 Soil Resistivity: field tests and estimation of zero-sequence currents
Quentin Louw, Pitshou Bokoro

1065 Peak Demand Control System using Load Prioritisation for Domestic Households
Olawale Popoola, Josiah Munda, Moreblessing Chipango

1072 MPPT of a Standalone Wind Energy Conversion System using Magnetostrictive Amorphous Wire Speed Sensor and Fuzzy Logic
Julius Ndirangu, John Nderu, Christopher Muriithi, Asaph Muhia

1078 A Study on Mitigation Techniques for Reduction and Elimination of Solar PV Output Fluctuations
Jeanne-Gisele Bamukunde, Sunetra Chowdhury

1084 An Alternative Method for Voltage Stability Assessment in Power System
Isaiah Gbadegesin Adebayo, Abdul-Ganiyu Adisa Jimoh, Adedayo Ademola Yusuff

1089 Assessment of Small Signal Stability of Power Systems with Wind Energy Conversion Unit
Thapelo Mosetlhe, Adedayo Yusuff, Yskandar Hamam

1095 Implications of renewable energy intermittency for power system supply planning
Charles Gaunt

1101 A Study of Technical and Regulatory Issues for Integration of Distributed Generation to Medium Voltage Networks
Avinash Ramdhin, Sunetra Chowdhury

1107 Islanding Power Systems to Minimize Impact of System Disturbances in Southern African Power Pool
Sydney Kadikula Zimba, Itai Nyamutswa, Alison Chikova

1113 Correcting the Induced Errors when using De Soto's Parameters in the PV Single Diode Model
Pieter Johannes Johnson Botha, Arnold Johan Rix

1119 PEM Fuel Cells: Failure, Mitigation and Dormancy Recovery Understanding the factors affecting the efficient control of PEMFC
Dennis du Plooy, Johan Meyer

1125 Solar PV Powered Mobile Cellular Base Station: Models and Use cases in South Africa
Banjo Aderemi, SP Daniel Chowdhury, Thomas Olwal, Adanan Abu-Mahfouz

1131 Effects of Fulgurites on the Earthing System
Rembuluwani Phillip Tshubwana, Miidzo Hove, Thokozani Shongwe

1137 Profit Based Unit Commitment Using Evolutionary Particle Swarm Optimization
Adline Bikeri, Christopher Maina, Peter Kihato

1143 Community-Developer Business Model Promoting Social Energy Enterprises (Case study of Mutunguru 7.8MW Community Driven Small Hydro Power Project)
Mwaura F. Njogu, Patrick Kimathi, Izael Da Silva

1149 Modelling and simulation of the South African designed Sun Chaser II solar vehicle
Christiaan Oosthuizen, Barend van Wyk, Yskandar Hamam

1155 Comparison of Hot Water Draw Models Integrated Within a Statistical Physically-Based Model for Electrical Demand of Domestic Water Heater
Giscard Mutsindu Binini, Josiah Lange Munda, Ognian Dimitrov Dintchev

1161 Inner Control Loops Approach to Control the Islanded Photovoltaic Microgrid
Guy Wanlongo Ndiwulu, Emmanuel De Jaeger, Angelo Kuti Lusala

1167 Architectural Framework of On-Board Integrator: An Interface for Grid Connected EV
Santoshkumar Hampannavar, Kena Likassa, Endalew Ayenew, Sandeep N, Udaykumar Yaragatti

1173 Network Strengthening Using Storage Support: A Case for Increasing Remote Generation
Brian De Beer, Arnold Rix

1179 Constrained optimisation of photovoltaic (PV) module layouts
Tafadzwa Gurupira, Arnold J. Rix

1185 Development of High Resolution Magnetic Field Measurements for Switching Arc Diagnosis of Low-Voltage Switchgear
Christian Reil, Hans-Peter Schmidt

1189 Quality Assessment of Harmonic Measurement Data from a Utility-Scale PV Plant
Jonathan Overett, Hendrik Vermeulen

1195 A simple methodology for estimating battery lifetimes in Solar Home System design
Nishant Narayan, Thekla Papakosta, Victor Vega-Garita, Jelena Popovic-Gerber, Pavol Bauer, Miroslav Zeman

1202 Optimizing the 5 KW Small HydroPower Supply in Mada-Gudi Community, Nassarawa State, Nigeria
Abubakar Suleiman, Folashade Folaranmi, Sa'ima Abdullahi, Jafaru Mahmud, David Dania, Mohammed Haruna

1208 Off-load Tap-change Transformer Impact under High Distributed PV Generation
Zama Goqo, Sanjeeth Sewchurran, David Dorrell

1214 Approaches for Solving Modern Power System Problems – A Review
Akintunde S. Alayande, Adisa A. Jimoh, Adedayo A. Yusuff

1220 Introduction to the South African Renewable Energy Grid Code Version 2.9 Requirements (Part I - Introduction)
Sanjeeth Sewchurran, Innocent Davidson

1225 Introduction to the South African Renewable Energy Grid Code Version 2.9 Requirements (Part II - Grid Code Technical Requirements)
Sanjeeth Sewchurran, Innocent Davidson

1231 Introduction to the South African Renewable Energy Grid Code Version 2.9 (Part III - Discussions and Conclusions)
Sanjeeth Sewchurran, Innocent Davidson

1236 Options for Alternative Electrical Power Supplies of ICCP in remote areas of Gauteng Province of South Africa, Part 1: Technical considerations
Lex Barend Pienaar, Adedayo Yusuff, Adisa Jimoh

1242 Performance Investigation of DFIG topologies with Different Design Parameters
OreOluwa Olubamiwa, Nkosinathi Gule

1248 A Metropolitan Municipality Power Quality Assessment as per IEEE 1459-2010
Seraphin Kasemuana, Arnold De Beer, Jh Pretorius

1255 Voltage Stability Index Based On Standard deviation-Mean Ratio for Identification of Weak Nodes
Adedayo Yusuff

1260 Home Energy Management Systems: A Qualitative Analysis and Overview
Stef Coetzee, Toit Mouton, Thinus Booysen

1266 Energy Solution of Zambia from Micro Hybrid Biomass – Solar Photovoltaic Power Plants
Likonge Makai, SP Daniel Chowdhury

1272 Evaluation of Advanced Biomass Technologies for Rural Energy Supply
Henry Wasajja, SP Daniel Chowdhury

1277 Optimal economic load dispatch in smart grids considering uncertainty
Oliver Dzobo, Ahmed Shehata, Chukwuma Leonard Azimoh

1283 An Empirical Model of Fire-Induced Airgap Voltage Breakdown Characteristics Under HVDC Conditions
Zola Ntshangase, Andrew Swanson, Nelson Ijumba, Anthony Britten

1290 Transient Analysis of a Start-up Synchronous Reluctance Motor with Symmetrical Distributed Rotor Cage Bars
Vitalis Aguba, Mbika Muteba, Dan Valentin Nicolae

1296 Optimal Placement Model of Multi-Type FACTS Devices in Power System Networks on a Limited Budget
Nhlanhla Malatji, Bhekisipho Twala, Nhlanhla Mbuli

1301 Analysis of DFIG Machine with Rotor-Wound Faults
Ahmad A. Salah, Youguang Guo, David G. Dorrell

1307 Assessment of Energy Management Opportunities in a DC Traction Network
A. Bani, K. Awodele

1313 Closed Loop Control Strategy of Back to Back PWM Converter Fed by PMSG Using Plecs Toolbox on Matlab/Simulink for Wind Energy Application
Molla Biweta Yimer

1319 Lightning Protection Of Hv Substations At Coastal Region And Enhanced Earthing System- Case Study
John Nderu, Livingstone Ngoo, Peterson Hinga

1325 Behaviors, Strategies, and Subconscious Visualizations of Eskom Grid Controllers Using an Insight Quotient (InQ) Approach
Panagiotis Lazanas

1331 Residential Load Variability and Diversity at Different Sampling Time and Aggregation Scales
Andreas I. Elombo, Thomas Morstyn, Dimitra Apostolopoulou, Malcolm D. McCulloch

1337 A Fault Classification and Localization Method In A Power Distribution Network
Xolani Magagula, Yskander Hamam, Adedayo Yusuff, Jaco Jordaan

Power Electronics and Devices **1344**

1345 FPGA Implementation of Open-Loop Controller for Five-Level Three Phase Modular Multilevel Converter
Rereloluwa Fatunmbi, Okezie Okoye, Olanrewaju Lasabi, Innocent Davidson

1351 General Transposed Series-Parallel Switched Capacitor Converter Topologies
Yuval Beck, Sigmond Singer

1357 Z-Source Active Rectifier for Wind Energy Applications
Cedrick Kala-Konga, Michael Gitau

1364 Non-Intrusive Efficiency Estimation of Induction Machines Using Parameter Identification Based on Steady State Stator Current Curve
Muhammad Aminu, Paul Barendse, Azeem Khan

1370 Development of an Internet Based Pre-paid Energy Meter
Nazmat Toyin Surajudeen-Bakinde, Sunday Olufenka Ayodele, Timilehin David Oloruntoba, Abdulrahaman Okino Otuoze, Nasir Faruk

1374 Condition assessment of SF6 circuit breakers using analysis of variance (ANOVA)
Pitshou Bokoro, Kajingolo Malandala

1378 The Optimal Design and Autonomous Testing of a Rotor-tied DFIG
OreOluwa Olubamiwa, Nkosinathi Gule

1384 Effect of Capacitive Auxiliary Winding on a Three-Phase Induction Motor Performance Behaviour
Mbika Muteba, Dan Valentin Nicolae

1390 A passively cooled 15 kW, 800 V DCDC converter with a peak efficiency of 99.7 %
Otto Kreutzer, Markus Billmann, Martin Maerz

1397 Electrical Machine Winding Faults Diagnosis using Periodogram
OdunAyo Imoru, Arun.M. Bhaskar, Adisa A. Jimoh, Yskandar Hamam

1402 Stabilizing Photovoltaic DC Rail Voltage Using An Active Filter
Edwin Ribisi, Peter Freere

Robotics and AI **1407**

1408 Robotic Hearing in Noise
Laura Jane Martinus, Johan Hanekom

1414 Low Cost Soft Endoscope Robotic Probe
Riaan Stopforth, Shaniel Davrajh, Kaspar Althoefer

1420 Gas Concentration and Equation Correlation Of the Figaro Sensors, used for Dangerous Environments
Riaan Stopforth, Shaniel Davrajh

1426 Automated adapting component transfer system using real-time robot control within a KUKA RobotSensorInterface environment
Luke Rogers, Herman Vermaak

1432 Privacy-preserving quantum machine learning using differential privacy
Makhamisa Senekane, Mhlambululi Mafu, Molibeli Taele

1436 An Decentralised System Approach for Controlling AGVs with ROS
Robert Walenta, Twan Schellekens, Alexander Ferrein, Stefan Schiffer

1442 The Effective Use of the Exhaustive Search Block Matching Algorithm in Railway Line Tracking
Enock T. Chekure, Kevin A. Naude, Peter Freere

1447 Removing Accelerometer Redundancy in Non-Gyro Inertial Measurement Unit
Nick Minnaar, Willie Smit

1453 Designing a Cost-Effective Autonomous Vehicle Control System Kit (AVCS Kit)
Li Dang, Nishanth Sriramoju, Girma Tewolde, Jaerock Kwon, Xiaoyuan Zhang

1459 Reduced Resolution Lane Detection Algorithm
Li Dang, Girma Tewolde, Xiaoyuan Zhang, Jaerock Kwon

Sensing and Intelligent Systems - Remote Sensing **1465**

1466 A generative Bézier curve model for surf-zone tracking in coastal image sequence
Michael Burke

1472 Design Guidelines for Ultra-low Power Gateways in Environment Monitoring Wireless Sensor Networks
Maximus Byamukama, Kabonire Ruhinda, Janet Nakato Nannono, Björn Pehrson, Geoffrey Bakkabulindi, Roseline Akol, Mary Nsabagwa, Robert Olsson, Emmanuel Kondela

1479 Introduction of the automated hydrographic survey systems for creation of electronic nautical charts of internal waterways in Southern Africa
Vladimir Karetnikov, Elizaveta Ratner, Aleksandra Ageeva

1485 On the suitability of using the Residual Method for estimation of the Noise Covariance Matrix in Hyperspectral Images
Asad Mahmood, Amandine Robin, Michael Sears

1491 Self Referred Capillary Probe Fabry-Perot Refractometer
Ronald Moorcroft, Michael Grobler

1496 LoRa and LoRaWAN Testbeds: a Review
Jaco M. Marais, Reza Malekian, Adnan M. Abu-Mahfouz

1502 Burst Leakage–Pressure Dependency in Water Piping Networks: Its Impact on Leak Openings
Kazeem B. Adedeji, Yskandar Hamam, Bolanle T. Abe, Adnan M. Abu-Mahfouz

1508 Software Defined Wireless Sensor Networks Security Challenges
Tebogo Kgogo, Bassey Isong, Adnan Abu-Mahfouz

1514 Wireless Node Energy Monitor using common Development Platforms
Petrus Van Staden, Ben Kotze

1520 Tunable Aperture Controlled by Thermal Expansion of Copper Beams
Keewoong Haan, Kukjin Chun

1522 3D Rail Modelling and Measurement for Rail Profile Condition Assessment
Vonani Rikhotso, Nico Steyn, Yskandar Hamam

1528 Detecting the presence of pigeons on PV modules in a picosolar system
Pierre Hertzog, James Swart

1534 Improving Customs Infraction-Detection And Risk Management With Gps Data
Ernest Bhero, Alwyn Hoffman

1541 A wireless communication system for environmental monitoring in smart cities
Oliver Masudi, Tsotsope Ramotsoela, Gerhard Hancke

1547 Evaluating the effect of Occlusion in Face Recognition Systems
Muhtahir Oloyede, Gerhard Hancke, Kapileswar Nellore

1552 Pose estimation of a mobile robot using monocular vision and inertial sensors data
Mary Alatise, Gerhard P Hancke

1558 Graph based Hydraulic Modelling of Pressure in Water Distribution Networks
Luemba Mpiana, Yskandar Hamam, Adnan M Abu-Mahfouz

1564 LTE-CommSense System and its Feasibility Analysis
Santu Sardar, Amit Kumar Mishra, Mohammed Zafar Ali Khan

1569 Mobile Cloud Computing and Application Programming Interfaces - a Review.
Henri van der Westhuizen, Gerhard Hancke

1575 Solar Home Energy Management System
Johan Botma, Gerhard Hancke, Tsotsope Ramotsoela

1581 Smart Street Lights using Power Line Communication
Pierre du Toit, Carel Kruger, Gerhard Hancke, Tsotsope Ramotsoela

1587 Smartphone Controlled WSN for a Smart Home
Henri van der Westhuizen, Gerhard Hancke, Tsotsope Ramotsoela

1593 Real Time Speed Detection and Ticketing System
Prateek Kambadkone, Gerhard Hancke, Tsotsope Ramotsoela

1599 Performance Analysis of Correlated Multi-Channels in Cognitive Radio Sensor Network based Smart Grid
Emmanuel Ogbodo, David Dorrell, Adnan Abu-Mahfouz

Author Index