2023 IEEE AFRICON

Nairobi, Kenya
20-22 September 2023

Pages 1-517

IEEE Catalog Number: CFP23AFR-POD
ISBN: 979-8-3503-3622-1

Copyright © 2023 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:	CFP23AFR-POD
ISBN (Print-On-Demand):	979-8-3503-3622-1
ISBN (Online):	979-8-3503-3621-4
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

IEEE AFRICON 2023
Table of Contents

title	authors	page
Architecting for Digital Transformation in Alternative Dispute Resolution	Laurie Butgereit	1
Use of Machine Learning for Realtime Water Quality Prediction	Samson Otieno Ooko, Elaine Kansiime Pamela and Grace Kwagalakwe	7
Hybrid Predator-Prey Model For Licensed Assisted Access Communication	Tatenda Gotora, Neco Ventura, Mqhele Dlodlo and Sindiso Mpenyu Nleya	13
Implementation of an Adaptive Five-Factor Authentication Scheme for Online Banking Services in South Africa	Glen Lehlohonolo Moepi and Topside Mathonsi	18
Coarse Tree Algorithm-Based Detection of Unstructured Cyber-Attacks in Oil and Gas Process Control Networks	Ugochukwu Onyekachi Obonna, Felix Kelechi Opara, Christian C. Mbaocha, Jude-Kennedy C. Obichere, Cosmas Ifeanyi Nwakanma, Love Allen Chijioke Ahakonye and Dong-Seong Kim	24
Assessment of mechanical and dielectric behaviour of sintered E-CR glass reinforced polyimide composite insulator core for mechanical load-bearing and high voltage insulation applications	V.E. Ogbonna, A.P.I. Popoola and O.M. Popoola	30
Mathematical Model for Study Characteristics of Ultra-High Frequency Selective Electromagnetic Shields Based on Circular Helical Elements	Olga Boiprav, Vadim Bogush, Sana Abdaljlil and Amer Zerek	33
Terrestrial Radio Propagation Research Datasets Repository	Kayode Sakariyah Adewole, Hawau Olagunju, Nasir Faruk, Agbotiname Lucky Imoize, Emmanuel Alozie, Olugbenga A. Sowande, Abubakar Abdulkarim, Aliyu D. Usman, Yusuf Olayinka Imam-Fulani, Abdulkarim A. Oloyede, Salisu Garba, Bashir Abdullahi Baba, Abdulwaheed Musa, Yinusa A. Adediran and Lawan S. Taura	N/A
Optimal Switching Sequence using an Improved Metaheuristic Technique in a Distribution Network System with Fixed DG Units	Shaibu Ali Juma, Thomson Mtonga, Edwell Tafara Mharakurwa and Kumbirayi Nyachionjeka	42
Multi-objective placement and sizing of WtE-based CHP-DG considering customer types, seasons and load growth	Moshood Alao, Olawale Popoola and Temitope Ayodele	48
Smart Meter Data Analytics using Decision Trees and Nearest-Neighbours	Jomanda Crystal Parath and Akshay Kumar Saha	54
Genetic Algorithm for Microwave Computer-Aided Design: The State of the Art	Abadahigwa Bimana and Saurabh Sinha	60
Allocation of UPFC using hybrid index-genetic-simulated annealing technique to improve static security of power systems	Engidaw Hailu, George Nyakoe and Christopher Muriithi	66
CuO Nanoparticles for p-Type TFTs in Complementary Flexible Electronics	Ulrich Hilleringmann and Julia Reker	72
Analysis of Electricity Power Generation and Load Profiles in Solar PV Microgrids in Rural Villages of East Africa: Case of Mpale Village in Tanzania	Ibrahim Mwammenywa and Ulrich Hilleringmann	78
A monitoring and rescuing system using Next Generation Mobile, Internet of Things and Artificial Intelligence for Freshwater Lakes in Africa	Haileyesus Amssaya, Fisseha Mekuria and Dithoto Modungwa	84
A Dual Cavity Pleated Structures Soft Pneumatic Actuator for Soft Robotic Applications	Shakiru Olajide Kassim, Visnevskis Krisjanis, Vahid Vaziri and Sumeet S. Aphale	90
Prediction of Renewable Electricity Output of Middle East and North Africa Countries Using Artificial Neural Networks	Hamda Abdi Atteyeh, Ahmet Kubilay Atalay, Dimis Daoud Ahmed and Mohamed Abdallah Ahmed	96
Perspectives on Tier Classification of Underwater Computing Platforms	Ayodele Periola, Akintunde Alonge and Ogudo Kingsley	102
Convolutional Neural Network Architecture Training Parameters Impact on Multi-Frequency Propagation Channel Model in the VHF and UHF Bands	Adebowale Quadri, Udensi Ferguson, Adubi Tunde, Faruk Nasir, Garba Salisu, Abdullahi Bashir, Imam-Fulani Olayinka, Sowande Olugbenga, Onidare Samuel, Abdulkarim Oloyede and Olawoyin	108
Electrical Energy sources management in Benin using dynamic programming	Ulrich Thierry Prodjinotho, Patrice Koffi Chetangny, Macaire Agbomahena, Victor Zogbochi, Laurent Medewou, Jacques Aredjodoun, Gérald Barbier, Didier Chamagne and Hypolite J.H Hounou	112
Artificial Intelligence for Improved Maternal Healthcare: A Systematic Literature Review	Musa Chemisto, Tar Jl Gutu, Kassim Kalinaki, Darlius Bosco Mwebesa, Percival Egau, Fred Kirya, Ivan Tim Oloya and Rashid Kisitu	117
ECN-Based Congestion Control Algorithm for High-Performing Data Centers	Ezekia Gilliard, Kashif Sharif, Arif Raza, Md Monjurul Karim and Ezekia Gilliard	123
Two-Way Relaying for Single-Active Orbital Angular Momentum Index Modulation.	Oluwabukunmi Williams Oso, Narushan Pillay and Hongjun Xu	129
Improving Frequency Regulation for Future Low Inertia Power Grids with Increased Penetration of Variable Generation: A Review	Brian Wamukoya	135
Towards the design of a distributed fiber optical sensor for mining applications	Wilfred K. Nyarangi, Enoch K. Rotich Kipnoo, Fred W. Masinde, Ronald K. Rop, Tim B. Gibbon and Henry C. Cherutoi	141
DFIG Grid Side Converter-Based Low-Frequency Electromechanical Oscillation Damping Controller	Germano Mugambi and Lijun Cai	145
Low cost IoT based cloud solution for intelligent Black Soldier Fly rearing.	Frank Ssemakula, Mary Patience Namugwanya, Bradley Alfred Mpeera Tumwine and Shawal Mbalire	151
Demonstration of 10 Gbps over G.655 Non-Zero Dispersion Shifted fiber for Smart Grid Meter Reading	Hillary Aradi, Enoch Rotich, David Waswa, Fred Masinde, James Jena and Timothy Gibbon	157
An UAV-based approach with thermal camera to buried Improvised Explosive Detection	Issaka Daouega, T. Fréderic Ouedraogo and Sadouanouan Malo	162

Internet of Things Based Quality and Environmental Monitoring System for Cassava Value chain	Gabriel Karerangabo, Egas Armando, Gatera Omar and Emmy Mugisha	165
Annual Energy Production Maximisation Effects on Turbine Thrust Coefficient and Turbulence Intensity	Mfon Charles, David Oyedokun and Mqhele Dlodlo	171
Machine Learning based Rain Gauge using Acoustic Data	Aaron Emmanuel, Blessed Guda, Nebiyou Hailemariam, Michael Meshach and Isaiah Barnabas	177
Artificial intelligence based chatbot model providing expert advice to potato farmers in Kenya	Meshack Korir, Waweru Mwangi and Michael Kimwele	181
Monitoring of Solar Photovoltaic Plant Power Transformers using Sweep Frequency Response Analysis	Fredrick Mukundi Mwaniki, Ahmed Ali Sayyid, Andres Escudero, Brian Nyangaresi and Silvester Mukaisi	187
Business Models for 5G-IoT Private Networks	Laurence Banda, Mjumo Mzyece and Fisseha Mekuria	193
Evidence from Lesotho secondary schools on students' intention to engage in artificial intelligence learning	Musa Adekunle Ayanwale	199
A survey on Internet of Things for precision agriculture	Michael Ochiel, Innocent Kitauka, Thacianne Tuyambaze and Ramadhani Sinde	205
Cassava Starch Measurement in the Field - Evolution of a Low Cost Test Instrument with Wireless Connectivity	Ali Issa, Clive Poole and Izzat Darwazeh	211
Exploring the Influence of Pre-Processing techniques on Obtaining Labeled Data from Twitter	Japheth Kiplang'At Mursi, Prabhakar Rontala Subramaniam and Irene Govender	214
Resource Optimisation in Cognitive-based Internet-of-Things with Edge Computing	Babatunde Awoyemi, Mduduzi Hlophe and Sunil Maharaj	220
An Internet of Things based system for Road Surface Condition Assessment using Machine Learning	Michael Ochiel, Japheth Abashe, Janeth Riwa, Shubi Kaijage and Judith Leo	226
Performance Analysis of One Tier and Two Tier Fuzzy Systems for Cluster Head Election in Wireless Sensor Networks	Catherine Onyango, Kibet Lang'At and Dominic Konditi	231
A Decision Support Tool Based on WSN and ML Models for Adaptation and Management of Groundwater Resources in Sub-Saharan Africa	Omar Haji Kombo, Santhi Kumaran and Emmanuel Ndashimye	237
Design and Simulation of a Low-cost Biomedical Ultrasound Transducer in Low- and Middle- Income Countries	Terry Berman, Suvendi Rimer and Khmaies Ouahada	242
Assessing the voltage stability of power system in the presence of increasing Solar PV penetration	Richard Olarewaju, Ayodeji Ogunjuyigbe, Temitope Ayodele, Thapelo Mosetlhe and Adedayo Yusuff	248
The use of open-source boards for data collection and machine learning in remote deployments	Gabriel Kiarie, Jason Kabi, Lorna Mugambi and Ciira Wa Maina	256
Multi-objective Optimization of 2G-HTS Coil for Magnetic Energy Storage System Using NSGA-II Algorithm	Gontrand Steve Sedjro Bagan, Maurel Richy Aza-Gnandji, Alexander Gelievich Kalimov and Melhyas Kple	262
WAVELENGTH REUSE IN PASSIVE OPTICAL NETWORK FOR POLARIZATION BASED ENVIRONMENTAL SENSING	Henry Cherutoi, James Jena, David Waswa and Tim Gibbon	268
IoT SECURITY IN CLOUD: A Review on Fog Layer Security	Japheth Kimeu, Mary Mtoi, Janeth Riwa and Ramadhani Sinde	273
Optimal OLTC Control Using ML Algorithms for Synchronous Generator Integration with Off-Grid Renewable Energy in Kenya	Harold Chisano Oyando, Kahoro Wachira and Henry Pwani Likare	279
An Image-set of Coffee Berries for CNN Classification	Boniface Ngocho, Elijah Mwangi, George Kamucha and Gwanggil Jeon	285
Power-delay Trade-off in Vehicle-to-Edge Networks Using Constrained Reinforcement Learning	Mduduzi Comfort Hlophe, Babatunde Seun Awoyemi and Bodhaswar T Maharaj	291
Spin transport across a nonmagnet ferrimagnet interface	Hillary Kirwa Choge, Godfrey Barasa and John Onyango Agumba	297
An optimal submodule capacitor sizing method for modular multilevel converters for HVDC applications	Ayubu Mbogela and Michael Gitau	303
Enhanced Message Authentication Code for Controller Area Network	Bhavesh Raju Mudhivarthi, Prabhat Thakur, Hashim Uledi Iddi and Ghanshyam Singh	308
Transient stability analysis of a line with service potential substations: A case study of Juja-Rabai line.	Joel Kitheka, Peter Musau, Abraham Nyete and Nicodemus Abungu	314
Performance of Machine Learning Models for Pandemic Detection Using COVID-19 Dataset	Sunday A. Ajagbe, Adekanmi Adegun, Pragasen Mudali and Matthew Adigun	320
K-means Initialisation for the Modelling of PLC Noise in Indoor Environment	Florence Chelangat and Thomas Afullo	326
Simple Exponential Smoothing for Forecasting the Numbers of Pole-Mounted Transformer Failures	Nhlanhla Mbuli and Jan-Harm Pretorius	332
Astronomy–Focused Engineering Learning Paradigm for Different Resource Contexts	Ayodele Periola, Akintunde Alonge and Ogudo Kingsley	337
Efficient Camera Trap Image Annotation Using YOLOv5	Yuri Njathi, Lians Wanjiku, Lorna Mugambi, Jason N. Kabi, Gabriel Kiarie and Ciira Wa Maina	342
Anomaly Detection on Time series Sensor Data Using Deep LSTM-Autoencoder	Stephen Githinji and Ciira Wa Maina	348
Spectrum Sharing in Kenya: Progress, Opportunities, Challenges and Way Forward	Leonard Mabele, Kennedy Ronoh, Julius Butime and Joseph Sevilla	354
Early Gestational Diabetes Mellitus Diagnosis Using Classification Algorithms: An Ensemble Approach	Oluwafemi O. S. Abe, Olumide O. Obe, Olutayo K. Boyinbode and Biodun N. Olagbuji	360
Forecasting models for monthly energy consumption using machine learning in Burkina Faso	Constantin Zongo, Frederic Tounwendyam Ouedraogo and Sadouanouan Malo	366
Application of ML Algorithm in Cloud-to-edge Computing: Analysis and Limitations	Emmanuel Adeniyi, Sunday A. Ajagbe, Olukayode Oki, Aminat O. Adebayo and Oyebola Olasupo	399
Evaluating the capability of 3G, 4G, and 5G networks in delivering a virtual clinic solution	Abby Blocker, Ajibola Oladokun, Ishaaq Datay, Joyce Mwangama and Bessie Malila	405

Intelligent Reflecting Surfaces in VL-NOMA: A Network Signal Enhancement Perspective	Chidi Emmanuel Ngene, Prabhat Thakur and Ghanshyam Singh	411
An Ngram-Based Approach to Determine Trends and Patterns in the Social Networks	Constance Ngila Ngila, Waweru Mwangi and Michael Kimwele	417
Transmission Line Modeling and State Space Formulation Under Capacitor Coupled Substation Power Tapping Conditions	Sinqobile Wiseman Nene, Bolanle Tolulope Abe and Agha Francis Nnachi	420
Design of an Asynchronous BCI based on a Facial Expression Paradigm for the Remote Control of Robotic Systems	Pierre Sedi, Michel Matalatala, Vital Kuti Lusala and Ernest Nlandu Kamavuako	426
Solar-Powered Shunt Active Power Filter Using an Advanced Inverter Topology ZSI: A Review	Elyas Smaida, Michael Juma Saulo, Kouzou Abdellah, George Nyakoe and Mary Ahuna	432
Location and Density Optimisation of a Two-Tier NOMA-Based 5G HetNet	Oliver Kaahwa, Edwin Mugume and Hanifa Nabuuma	438
DESIGN AND SIMULATION OF SINGLE MODE RIB WAVEGUIDE BASED ON THIN FILM LITHIUM NIOBATE ON INSULATOR	Alex Cheptang, Faith Leting, Dismas Choge and David Waswa	444
Feasibility Study of Improving Blockchain-Based Self-Sovereign Identity Security using Artificial Intelligence And Lightweight Cryptography	Joel Herve Mboussam Emati, Hedgar Plessy Mboussam and Vianney Kengne Tchendji	447
An Internet of Things-based Smart Water Meter with Machine Learning-aided Water Quality Assessment	Marvin Jagen, Joel Ariiho, Edwin Mugume and Dorothy Okello	450
Frequency Stability of a Smart Grid with Solar Power Integration Using Statcom	Ruth Kasera and Peter Musau	456
Hybrid Speckle De-Noising Filters for Ultrasound Images	Kwazikwenkosi Sikhakhane, Suvendi Rimer, Mpho Gololo, Khmaies Ouahada and Adnan Abu-Mahfouz	462
Performance Analysis of Joint Transmission CoMP schemes for ABS assisted cellular networks	Sheila Mugala, Jonathan Serugunda, Li Zhang, Dorothy Okello and Jihai Zhong	468
Design of Dual-band Substrate Integrated Waveguide Dielectric Resonator Antenna in D-band	Emmanuel Chemweno, Pradeep Kumar and Thomas Afullo	474
Voltage Profile Improvement in Unbalanced Distribution Grids by Sequential Quadratic Programming	Mohammed Bamatraf, Oguzhan Ceylan, Ioana Pisica and Aydogan Ozdemir	479
Condition Monitoring and Fault Diagnosis of Induction Motor Faults using Deep Learning : A Review	Lydiah Sikinyi, Christopher Maina and Livingstone Ngoo	485
Tertiary Education Integrity in a ChatGPT Conscious World: Preliminary Kenyan Observations	Kinyua Wachira, Lydiah Njoki Wachira, Elijah Mwangi, Heywood Ouma Absaloms and Gwanggil Jeon	491
Microchip Rectangular patch Antenna with Diamond Inset for IoT Applications	Ezra Kanana, Erick Ochieng and Mary Ahuna	497
Adoption of Digital Technologies for Heritage Conservation: the Case of Al-Busaidy Heritage Site, Mombasa County, Kenya	Brian Boit, Joel Oyuga and Joseph Kedogo	503
Solar Photovoltaic Module Recycling	Sally Musonye and Allan Leshao	509
Using a Digital Twin for Greenhouse Tunnel Temperature Management and Prediction	Keegan Hull, Mj Booysen, Mosima Mabitsela and Ethel Phiri	512
Hybrid Large Intelligent Surfaces	Yashil Morar, Narushan Pillay and Hongjun Xu	518
The Role of Higher Education Institutions in Enabling the Fourth Industrial Revolution: A Bibliometric Analysis	Sithandiwe Twetwa-Dube, Smitha Vijayalekshmi, Divya Vinothkumar and Sibukele Gumbo	524
The latest developments in Software Defined Networking: Adoption rate and challenges	Ntshuxeko Makondo, Hlabishi Kobo and Ehleketani Topside Mathonsi	527
Mapping of studies on ethical responsibilities of software engineers	Senyeki Marebane, Robert Hans and Potego Kgaphola	533
Maximum Likelihood Estimation of the Gamma and Gamma Mixture Distribution	Bashan Naidoo and Hongjun Xu	539
Sustainable Internet4All in South African Rural and Township Communities	Nosipho Mthethwa, Nakampe Sebopetse, Mla Vilakazi, Luzango Mfupe, Mofolo Mofolo and Fisseha Mekuria	545
Assessment and analysis of the various electrical system configurations used to power BTS sites in Benin	Tchike Mignimahou Sylvain, Chetangny Patrice Koffi and Zogbochi Victor	551
Evaluation of Intrusion Detection System for the Distributed Denial of Service Attack on Internet of Things in Fog Computing Environment	Miyelani Silence Madiba and Mthulisi Velempini	557
Concurrent Voltage and Frequency Regulation Via Distributed Droop-Based Control Method in an Autonomous Microgrid	Shu Godwill Ndeh, Ngwashi Divine Khan, Lawrence Kiprono Letting, Tanyi Emmanuel and Musong Louis Katche	563
Fractional differenced Modelling to Bursty Impulsive Noise in Low-Voltage PLC Networks: Long-term memory process	Steven O. Awino and Thomas J. O. Afullo	569
SSK-Sequence Modulation: A Study of Secrecy Rate and Receiver Computational Complexity	Abdulrahman Faris, Peter Akuon and Vitalis Oduol	574
Developing an Automatic Speech-to-Speech Translator Mobile Application using AWS	Benjamin Naidoo and Farzad Ghayoor	579
Optimization of a diesel system – stockpiling for supplying a remote BTS station	Patrice Koffi Chetangny, Victor Zogbochi, Mèhundo Walix Leslie De, Sylvain Tchike, Hypolite Jordao Hounnou, Jacques Aredjodoun, Sossou Houndedako, Gérald Barbier and Didier Chamagne	584
Current Biases and Future Research Avenues for Archive Image Colourisation	Kinyua Wachira, Elijah Mwangi, Heywood Ouma Absaloms and Gwanggil Jeon	589
Face Coded Modulation: Better Input-BackOff Power for non-Linear Amplifier Operation	Peter Akuon	592
New Insights on Application of Return Loss Measurement for Starch Content Estimation in Cassava	Temitope Odedeyi and Izzat Darwazeh	596
Design of a Methodological Framework for Community Based Digital Literacy: A Kenyan Case Study	Cynthia Oguna and Rebecca Strachan	599
Low-complexity Block-Based Decoding Algorithms for Short Block Channels	Mody Sy and Raymond Knopp	605

Optimal reactive power dispatch considering the penetration level of renewable generation	Wayne Masamvu, Oliver Dzobo and Yanxia Sun	610
The Efficiency of Convolution on Gemmini Deep Learning Hardware Accelerator	Dennis Gookyi, Michael Wilson, Roger Ahiadormey, Derek Asiedu, Paul Danquah and Raymond Gyaang	616
Performance Analysis of Variable Phase-Pole Induction Machine for Electric Traction Application: Finite Element Method	Mesfin Tilahune, Luca Peretti and Mengesha Mamo	621
Effective Mitigation Strategies for Social Engineering Attacks in Mobile Money Services: A Case Study in Kenya	Arisema Mezgebe Mihretu, Joseph Mdumuka, Maxmillian Shetto, Ofentse Phuti Rice, Patrick Iradukunda, Tunga Tessema Chamisso, Victor Mwangi and Yves Byiringiro	627
Fractional MQAM: Analysis of Ergodic Capacity and Flexible PAPR under AWGN Channels	Peter Akuon	630
Edge-based Technology for the Design of Bridges Alerting System: A Practical Case	Stefano Rinaldi, Alessandro Depari, Paolo Ferrari, Alessandra Flammini and Emiliano Sisinni	635
Modeling of Ethiopia-Kenya HVDC for Power System Stability Study	Teshome Hambissa, Mehrdad Ghandhari and Getachew Biru	641
ONSHORE WIND FARM OPTIMIZATION AND CONTROL	Mandisi Gwabavu, Ramesh Bansal, Raj Naidoo and Siphokazi Pemba	647
Culturally-Sensitive Human-Robot Interaction: A Case Study with the Pepper Humanoid Robot	Pamely Zantou and David Vernon	653
Analytics of Electricity Distribution Transformers Metering Data in Nigeria	Abubakar Sani Hassan, Sambu Kanteh Sakiliba and Abubakar Garba	659
Design of Ultra-Low Power Comparator in 65 nm CMOS Technology with Rail-to-Rail Input Range	Lukas Nagy, Michal Sovcik and Viera Stopjakova	662
Detecting Phishing Attacks Using Feature Importance-based Machine Learning Approach	Belyse Rugangazi and George Okeyo	666
BER Performance Analysis of Antenna Sequence Modulation (ASM) under arbitrarily correlated Rician fading Channel	Joseph Obadha, Peter Akuon and Vitalis Oduol	672
Performance Analysis of Filtered Orthogonal Frequency Division Multiplexed LDPC Codes for Satellite Communication in the Ka-Band	Bonginkosi Gumede, Emmanuel Mukubwa, Nelendran Pillay and Innocent E Davidson	678
Design and Implementation of A Smart Traffic Light System for Efficient Traffic Regulation	Emmanuel Munguakonkwa Migabo	684
Analysis of the impact of improper termination and grounding of substation cables	Jabu Mahlangu, Agha Nnachi, Aloys Akumu and Bolanle Abe	690
Modern Control Center Operational Situational Awareness Considering Electromechanical Oscillations	Rajan Ratnakumar, Johnoy Richards and Kumar Venayagamoorthy	695
Robot cleaner localization using RFID and vision system.	Farida Helaly, Sarah Bassiouny and Yasmine Zaghloul	701
Arc - Flash Calculations using IEEE Std 1584-2018 and Mitigation Measures – Case Study	Julius Ndirangu, Eliud Limo and Peter Kimemia	706
Climate Smart Agricultural Prediction for Rural Small-scale Farmers using Internet of Things	Ayanda Zulu, Olukayode Oki and Matthew Adigun	709
Towards Stress Testing A UPF Node On A 5G Standalone Testbed	Lusani Mamushiane, Albert A. Lysko, Thoriso Makhosa, Joyce Mwangama, Hlabishi Kobo, Alec Mbanga and Rofhiwa Tshimange	715
Random Access Scheme for Machine Type Communication Network Using Reinforcement Learning Approach	Paul Orim, Neco Ventura and Joyce Mwangama	722
IoT Educational Management and Consultancy System for Egyptian Public Schools	Omar Ashraf Saleh, Salma Maher, Dina Mohamed Sherif, Nada Sharaf and Yasmine Zaghloul	728
Machine Learning Techniques for Evaluating Disdrometer-Derived Raindrop Measurements over Radio Links	Tsietsi Ramatladi and Akintunde Alonge	734
ONIGBOLO's 25 MWp PV2 Solar Power plant connection impact on the stability of Benin transmission grid	Patrice Koffi Chetangny, Kévin Elisée Sonon, Mehundo Walix Leslie De, Victor Zogbochi, Jacques Aredjodoun, Sossou Houndedako, Gérald Barbier and Didier Chamagne	740
Data Analytics for Volunteer-Based Educational Application	Omar Sherif, Yasmine Zaghloul and Nada Sharaf	746
A Control Strategy for a Grid Connected PV and Battery Energy Storage System	Maxwell Ngala and Christopher Maina	752
The Analytical Modelling and Estimation of the Signal to Noise Ratio for the GNSS Receivers	Bhekinkosi Madonsela, Emmanuel Mukubwa and Innocent Davidson	756
A Load Management Solution For Peak Periods in South Africa	Lunika Justice, Sibulele Mtakati and Kimon Silwal	763
PSO price penalty factor choices for solving dynamic economic emission dispatch problem.	Oliver Dzobo	768
Potential Privacy Violation on Manual Contact Tracing: A Rwanda Case Study	Erick Semindu, Nadia Lorraine Niyonsaba, Eric Ishimwe, Anny Carella Irumva, Gladys Inabeza, Elie Niringiyimana, Patrick Mazimpaka and Trevor Henry Chiboora	773
AC Power Flow-based Transmission Constrained Generation Expansion Planning with Intermittent RES	Julius Kilonzi Charles, Peter Musau Moses Musyoki and Jackson Mwangi Mbuthia	777
A Block Mining Based Machine Learning Scheme For Data Integrity In Blockchain Based IoT Solutions.	Joel Herve Mboussam Emati and Hedgar Plessy Mboussam	783
A Data Management Model for Malaria Control: a Case of Rwanda	Happiness Rose Mary, Mukamakuza Pierrette Carine and Tuyishimire Emmanuel	789
Unlocking the Potential of Blockchain in Sub-Saharan Africa: Opportunities and Challenges	Christopher G. Harris	795
A Green AI Model Selection Strategy for Computer-Aided Mpox (formerly Monkeypox) Detection	Chinedu Ezenkwu, Bliss Utibe-Stephen, Iniabasi Affiah and Betabasi Daniel	801
Bandit algorithms applied in online advertisement to optimize click-through rates	Elie Ngomseu Mambou and Isaac Woungang	807
Application of Networked Microgrids for Distribution System Restoration after Natural Disasters	Mahtab Ghobadi, Meghdad Tourandaz Kenari, Mohammad Sadegh Sepasian and Aydogan Ozdemir	812

Evolving Cauchy Possibilistic Clustering for Data Stream Modeling and Classification	Igor Skrjanc	818
Effect of the variation of atmospheric refractive index on signal transmission for digital Terrestrial Television in Jos, Nigeria	Jangfa Zhimwang, Enoh Ogherohwo, Akintunde Alonge, Agbalagba Ezekiel and Shaka Samuel	824
A Machine Learning Approach to Resource Management in Cloud Computing Environments	Samuel Manam, Klaus Moessner and Philip Asuquo	828
Skill Sets for Microgrids Sustainability – The Case of East Africa	Paul Bogere, Henrik Bode and Katrin Temmen	834
Design Principles for Pedagogical Improvisation	Suresh Shanmugasundaram and Divya Preya Chidambaram	837
Demand-Side-Management for Optimal dispatch of an Isolated Solar Microgrid	Godiana Hagile Philipo, Josephine Nakato Kakande and Stefan Krauter	843
Duty Ratio Optimization for a Multi-Level Poly-phase Cascaded H-Bridge Grid-Interactive Inverter Using Model Predictive Current Control Based on Explicit Integration Algorithm	Edmund Kwafo Adjei-Saforo, Emmanuel Asuming Frimpong, Francis Boafo Effah, Misbawu Adam, Ebrahimpanah Shahrous and Su Hongsheng	849
Agent-Based Modeling and Simulation for Transmission Dynamics and Surveillance of Dengue: Conceptual and Design Model	Luba Pascoe, Devotha Godfrey Nyambo, Karen Bradshaw and Thomas Clemen	855
An Experimental Investigation into High Bandwidth Wireless Communication Standards for the Underground Mine Stope	Brenton Chetty, Sherrin Isaac and Tom Walingo	861
Effect of Outer Length on the Electromagnetic Halbach Array	Tamuno-Omie Gogo and Dibin Zhu	867
Development Of A Multi-input Multi-output DCDC Buck-Buck Converter For Sustainable Energy	Mthobisi Ntuli, Agha Francis Nnachi and Coneth Richards	872
Interference challenges on 5G networks: A Review	Ahmed Ali, Terdoo Akiishi and Esenogho Ebenezer Esenogho Ebenezer	878
Ai-based palm print recognition system for high-security applications	Ahmed Ali, Abraham Martey and Ebenezer Esenogho	884
Vision Based Automatic Translation for South African Sign Language (SASL)	Mokgadi Setshekgamollo, Mohohlo Tsoeu and Robyn Verrinder	890
Enhancing Circular USTLD using Signal Space Diversity	Tahmid Quazi and Sulaiman Saleem Patel	896
A Convolutional Neural Network Framework for Predicting Student Drop Out in Universities	Valentine Kendagor, Geoffrey Chemwa and Wilson Cheruiyot	901
Proof of Equation: A Novel Consensus Algorithm for Dynamic Spectrum Access	Thiwanka Silva, Madhushika Bamunuge, Dilusha Dissanayake, Chatura Seneviratne, Tharindu Gamage and Madhusanka Liyanage	907
Navigating the Kikuletwa River Levels with Deep Learning: An LSTM-based Approach to Forecasting	Lawrence Mdegela, Erik Mannens, Yorick De Bock and Edith Luhanga	913
Leveraging the Internet of Things and Cloud Computing: A Crowdsourcing Web Application for Reporting Hazard Incidents	Reginald Ogu, Gloria Chukwudebe, Alex Watila, Uche Mbanaso, Chinomso Okoronkwo and Nkwachukwu Chukwuchekwa	916
Solar Mini-grid Planning Considerations for Future Central Grid Integration: A Case for Rwanda	Miquilina Anagbah and Barry Rawn	921
Some Characteristics of Commercial Load during First Wave of COVID-19 in South Africa	Akintunde Alonge and Kgaogelo Mampa	924
Sinzing of hybrid photovoltaic/Diesel power plant for electrification of commune “Golfe 3” in Lomé, Togolese republic	Patrice Koffi Chetangny, Laurent Medewou, Hypolite Jordao Hounnou, Biramah Kekely Moïse Kwoasi, Jacques Aredjodoun and Sossou Houndedako	930
Perceptions of STEM vs. Non-STEM Teachers toward Teaching Artificial Intelligence	Musa Adekunle Ayanwale and Ismaila Temitayo Sanusi	933
Static Transmission Network Expansion Planning considering voltage limits.	Faith Eseri Inyanga, Irene N. Muisyo and Keren K. Kaberere	938
Affordable Wearable Devices with Low-latency Wireless Communication	Anton Kos, Anton Umek and Sašo Tomažič	944
Deploying Quantum Key Distribution into the Existing University Data Infrastructure	Ondrej Klicnik, Klara Turcanova, Petr Munster, Adrian Tomasov, Tomas Horvath and Jan Hajny	949
An Improved DC–AC Power Converter	Candidus U. Eya, Emenike. C Ejiogu, Genesis N Ajah, Gerald. C Diyoke, Oluchi. C. Ugbe and Nonso.I Chikani	952
A Strategy to Develop and Translate Custom 5G Network Slice Templates using Machine Learning Techniques	Humphrey Owuor, Joyce Mwangama and Bessie Malila	958
Solar Power Solution for Telecommunications Industry	Charles Onyango and Benson Ojwang	964
Modeling and Analysis of Residential DC Microgrid Energy Management Using System of Systems Architecture	Fannie Masango, Jaco Jordaan and Agha Francis Nnachi	968
Energy Management Systems in Microgrids	Komla Folly and Prathna Seewnath	974
Preliminary Study on the Development of an Isolated Microgrid for University Environment	Komla Folly and Sibabalo Noludwe	979
A digital and additive manufacturing approach for the fabrication of custom orthoses	Lucy W. Kariuki, Bernard W. Ikua, Samuel K. Karanja and Stephen P. Ng'Ang'A	985
Disambiguation of Visual Representations	Oscar Ondeng, Peter Akuon and Heywood Ouma	989
Software Tools for Power Consumption Monitoring for Open 5G and Beyond Research: Brief Review	Rozeena Ebrahim, Fhatuwani Luvhengo, Mla Vilakazi, Lusani Mamushiane and Albert A. Lysko	995
Power Consumption Measurement Tool for Research on Open 5G and Beyond	Rozeena Ebrahim, Mla Vilakazi, Chris R. Burger and Albert A. Lysko	1001
Small Modular Reactors for South Africa Base Load Energy sustainability	Mawande Kutyana, Agha Francis Nnachi, Athini Pantshwa, Bolanle Abe and Aloys Oriedi Akumu	1006
Deep Reinforcement Learning Approach to Slice Admission Control for resilient 5G Wireless Network with Multidimensional State Space	Mourice Otieno Ojijo, Neco Ventura and Daisy Ondwari	1012
LTE-M for IoT Healthcare - Regression or Adaptation?	Venkata Virajit Garbhapu and Sundararaman Gopalan	1018
Large Language Models (LLMs): Representation Matters, Low-resource Languages and Multi-Modal Architecture	Ganesh Mani and Galane Basha Namomsa	1021
Gender, Workforce and Artificial Intelligence	Isioma Masi and Chioma Onoshakpor	1027

Study of total selectivity between the Benin's distribution and transmission networks	Patrice Koffi Chetangny, Victor Zogbochi, Hypolite Jordao Hounnou, Jacques Aredjodoun, Mahoudjro Esli Koussouali, Sossou Houndedako, Didier Chamagne, Gérald Barbier and Mèhundo Walix Leslie De	1030
Ground truths to support remote-sensing inference of irrigation benefits and effects: Examining the relationship between rainfall and vegetation towards differentiating irrigated from non-irrigated croplands in Rwanda	Fidelis Bologo, Barry Rawn and Tunmise Raji	1036

Additional Paper

STEM-Bots: Computing Resources for Everyone	Enric Cervera, Angel P. del Pobil	1042