2022 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS 2022)

Toronto, Ontario, Canada
1-4 June 2022

Pages 1-496

IEEE Catalog Number: CFP22Y72-POD
ISBN: 978-1-6654-8685-9

Copyright © 2022 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: CFP22Y72-POD
ISBN (Print-On-Demand): 978-1-6654-8685-9
ISBN (Online): 978-1-6654-8684-2

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

Content:

SL NO.	PAPER NAME	AUTHORS WITH AFFILIATION	PAGE NO.
1	Integrating Mechanistic Information to Predict Drug-Drug Interactions and Associated Relevance for Decision Support	Adeeb Noor (King Abdulaziz University, Saudi Arabia)	1
2	Design and Implementation of a Very-Low-Power Wireless Network of Sensors in an Underground Utility Tunnel for Medium and High Voltage Transmission Lines	Adil Rachid (Polytechnic University of Catalonia, Spain); Antonio Miguel Lopez Martinez (Polytechnic University of Catalonia (UPC), Spain); Sebastian Moreno Garcia (& Infisat, Spain)	5
3	Design of 24 GHz ISM Band Microstrip Patch Antenna for 5G Communication	Debalina Mollik, Rima Islam, Afrin Binte Anwar and Prodip Kumar Saha Purnendu (American International University Bangladesh Address Including Country Name, Bangladesh)	12
4	Detection of Corona Virus Infection Using Convolutional Neural Network	Al Sameera (Birla Institute of Technology and Science Pilani, Dubai Campus, UAE, United Arab Emirates); Vilas H Gaidhane (Birla Institute of Technology and Science Pilani, Dubai Campus, UAE, India)	18
5	A Review of Cognitive Dynamic Systems and Cognitive IoT	Alessandro Giuliano, Waleed Hilal, Naseem Alsadi and Stephen Andrew Gadsden (McMaster University, Canada); John Yawney (Adastra Corporation, Canada)	24

6	IoT Devices Proximity Authentication in Ad Hoc Network Environment	Ali Abdullah S. AlQahtani (North Carolina A&T State University, USA); Hosam Alamleh (University of North Carolina Wilmington & Louisiana Tech University, USA); Baker Al Smadi (Grambling State University, USA)	**31**
7	Dynamic Modeling of a Micro Solar Electric Vehicle for Pakistan Using Simulink	Ali Husnain and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**36**
8	An Optimum Sizing for a Hybrid Storage System in Solar Water Pumping Using ICA	Amirhossein Jahanfar and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**45**
9	A Real-Time Parking Space Occupancy Detection Using Deep Learning Model	Raktim Raihan Prova, Title Shinha, Anamika Basak Pew and Rashedur M Rahman (North South University, Bangladesh)	**51**
10	Solar PV System for Self-Consumption	Ananna Khan, Abdul Kahar Siddiki and Rashedur M Rahman (North South University, Bangladesh)	**58**
11	Provision of Information and Detection Systems on Two-Wheeled Motorcycle Accidents	Andi Nur Faisal and Amil Ahmad Ilham (Hasanuddin University, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)	**66**

12	A Data-Centric Machine Learning Approach for Controlling Exploration in Estimation of Distribution Algorithms	Antonio Jose Bolufe-Rohler and Jordan Luke (University of Prince Edward Island, Canada)	**72**
13	Aggregated Modeling of Synchronous Generators Using Transfer Matrices	Arash Safavizadeh and Erfan Mostajeran (The University of British Columbia, Canada); Seyyedmilad Ebrahimi (University of British Columbia, Canada); Taleb Vahabzadeh (The University of British Columbia, Canada); Juri Jatskevich (University of British Columbia, Canada)	**81**
14	Systematic Analysis and Proposed AI-Based Technique for Attenuating Inductive and Capacitive Parasitics in Low and Very Low Frequency Antennas	Kate G Francisco, R-jay Relano, Mike Louie Enriquez, Ronnie Concepcion II, Jonah Jahara Baun, Adrian Genevie G. Janairo, Ryan Rhay P. Vicerra and Argel Bandala (De La Salle University, Philippines); Elmer P. Dadios (Philippines, Philippines); Jonathan Dungca (De La Salle University, Philippines)	**88**
15	IoT Enabled Smart Solar Panel Monitoring System Based on Boltuino Platform	Pallav Dutta, Ashim Mondal and Md Jishan Ali (Aliah University, India)	**95**
16	A Practical Approach to the Development of a Decision-Supporting System Based on Fuzzy Neural Network in Information and Telecommunication Systems	Avaz Ergashevich Kuvnakov (TUIT, Uzbekistan)	**102**

17	A Universal Method for Solving the Problem of Bending of Plates of Any Shape	Azamatjon Yusupov (Andijan Machine Building Institute, Uzbekistan)	**106**
18	Development of Stochastic Distribution Model of Contaminated Water Treatment Complex	Bakhadir Begilov (Nukus Branch of Tashkent University of Information Technologies Named After Muhammad-Al Khorezmi, Uzbekistan)	**111**
19	Predictive Maintenance and Condition Monitoring in Machine Tools: An IoT Approach	Brett Sicard and Naseem Alsadi (McMaster University, Canada); Petros Spachos (University of Guelph, Canada); Youssef Ziada (Ford Motor Company, Canada); Stephen Andrew Gadsden (McMaster University, Canada)	**117**
20	Research on Ambient Backscatter Communication Signal Detection Algorithm Based on Digital Terrestrial Multimedia Broadcast	Chen Ruan and Hongyi Wang (National University of Defense Technology, China); Zheng Liming (National University of Defence Technology, China); Jianfei Wu (National University of Defense Technology, China); Fengxian Ma (Tianjin Institute of Advanced Technology, China)	**126**
21	Dynamic Analysis of Demographic Sentiment	Joshua Weston, Brenden Bickert and Caleb Stasiuk (Thompson Rivers University, Canada); Fadi Alzhouri (Trent University, Canada); Dariush	**131**

		Ebrahimi (Thompson Rivers University, Canada)	
22	Use of Drones (UAVs) for Pollutant Identification in the Industrial Sector: A Technological Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Julio Huamanchahua and Fabiola Flores (Universidad San Ignacio de Loyola, Peru)	**139**
23	Nursery With Automation and Control Systems for the Production of White Chuño (Tunta)	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Alem Huayta Uribe, Jalber Macuri Vasquez and Hitan Cordova Sanchez (Universidad Continental, Peru)	**145**
24	Biological Signals for the Control of Robotic Devices in Rehabilitation: An Innovative Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Luis Alberto Huamán Lévano (Universidad Continental, Peru); Jose Asencios Chávez (Universidad Tecnológica del Perú, Peru); Nicole Caballero Canchanya (Universidad Nacional Mayor de San Marcos, Peru)	**150**
25	Human Cinematic Capture and Movement System Through Kinect: A Detailed and Innovative Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Jhon Rodrigo Ortiz Zacarias, Yerson Taza Aquino and Jhon Quispe Quispe (Universidad Continental, Peru)	**157**
26	Transtibial Electromechanical	Deyby Huamanchahua (Universidad de Ingeniería y	**164**

	Prosthesis Based on a Parallel Robot: A Innovate Review	Tecnología - UTEC, Peru); Diego Osores Aguilar and Victor André León Sales (Universidad Nacional Mayor de San Marcos, Peru); Yadhira Samhira Valenzuela Lino (Universidad Continental, Peru); Harold Huallanca Escalera (Universidad Peruana de Ciencias Aplicadas, Peru)	
27	Knee and Ankle Exoskeletons for Motor Rehabilitation: A Technology Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Elvis J. de la Torre Velarde (Universidad Peruana de Ciencias Aplicadas, Peru); Ana Quispe Piña (Universidad Tecnológica del Perú, Peru); Cesar Luciano Otarola Ruiz (Universidad de Ingeniería y Tecnología UTEC, Peru)	**171**
28	Hand Exoskeletons for Rehabilitation: A Systematic Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Sayda Huacre (Universidad Nacional Mayor de San Marcos, Peru); Pedro Toledo Garcia (Universidad de Ingeniería y Tecnología - UTEC, Peru); Jack Aguirre (Universidad Nacional de Trujillo - UNT, Peru)	**178**
29	Artificial Intelligence Applied in Human Medicine With the Implementation of Prostheses	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Ismael Alvarado Landeo, Erick Surichaqui Montalvo and	**184**

		Kener Velasquez Colorado (Universidad Continental, Peru)	
30	Land-Mobile Robots for Rescue and Search: A Technological and Systematic Review	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Kevin Aubert, Mirella Rivas, Eduardo Guerreo, Laura Kodaka and Diego Guevara (Universidad de Ingeniería y Tecnología UTEC, Peru)	**191**
31	Efficient Simulation of Variable-Speed Diesel-Engine Generators Using Constant-Parameter Voltage-Behind-Reactance Formulation	Erfan Mostajeran and Arash Safavizadeh (The University of British Columbia, Canada); Seyyedmilad Ebrahimi and Juri Jatskevich (University of British Columbia, Canada)	**197**
32	Detection and Analysis Types of DDoS Attack	Erkin Navruzov (National University of Uzbekistan, Uzbekistan)	**203**
33	Suicide Rate and Factors Analysis: Pre and Post COVID Pandemic	Maryam Heidari and EswaraChandraSai Pamidimukkala (George Mason University, USA)	**210**
34	Employee Turnover Prediction Model for Garments Organizations of Bangladesh Using Machine Learning Technique	Lutfun Nahar, Farzana Tasnim, Zinnia Sultana and Farjana Akter Tuli (International Islamic University Chittagong, Bangladesh)	**218**
35	Machine Learning Models to Predict COVID-19 Cases in the DC Metro Area	Maryam Heidari, Michael Thompson, Thao Tran, Ghadah Alshabana and Ashritha Chitimalla (George Mason University, USA)	**223**

36	Server-Side Distinction of User Mobility Using Machine Learning on Incoming Data Traffic	Hosam Alamleh (University of North Carolina Wilmington & Louisiana Tech University, USA); Ali Abdullah S. AlQahtani (North Carolina A&T State University, USA); Baker Al Smadi (Grambling State University, USA)	**231**
37	Data Centric DAO: When Blockchain Reigns Over the Cloud	Kamal Azghiou (Mohammed First University & EI team, Morocco); Ibrahim Mehdi (University Mohammed 1, Morocco); Moussaab Sbai (Mohammed First University (UMP), Morocco); Mohamed Mazlin (Université Mohammed Premier & ENSAO, Morocco)	**235**
38	Algorithmic Analysis of the System Based on the Functioning Table and Information Security	Inomjon Yarashov (National University of Uzbekistan, Uzbekistan)	**242**
39	Using Algorithmic Modeling to Control User Access Based on Functioning Table	Islambek Saymanov and Inomjon Yarashov (National University of Uzbekistan, Uzbekistan)	**247**
40	Sensory Data Fusion Using Machine Learning Methods for In-Situ Defect Registration in Additive Manufacturing: A Review	J Akhavan (Stevens Institute of Technology, USA); Souran Manoochehri (Chair of Dept ME, Stevens Institute of Technology)	**252**
41	Unmanned Aerial Vehicle Control Using Hand	Rocio Alba-Flores and Jack Nemec (Georgia Southern University, USA)	**262**

	Gestures and Neural Networks		
42	Feature Selection Algorithm Characterization for NIDS Using Machine and Deep Learning	Jyoti Verma (Punjabi University Patiala & Punjab Institute of Technology, India); Abhinav Bhandari (Punjabi University, India); Gurpreet Singh (Maharaja Ranjit Singh Punjab Technical University, India)	**266**
43	An Approach to Design Keyboard and Mouse Assisting Device for Handicap Users	Kamran Hameed (Imam AbdulRahman Bin Faisal UNiversity, Saudi Arabia); Syed Mehmood Ali and Uzma Ali (Imam Abdulrahman Bin Faisal University, Saudi Arabia)	**273**
44	Design of Monitoring System for Respiratory Diagnosis	Kamran Hameed (Imam AbdulRahman Bin Faisal UNiversity, Saudi Arabia); Sana Ijlal Shahrukh and Ijlal Shahrukh Ateeq (Imam Abdulrahman Bin Faisal University, Saudi Arabia)	**279**
45	Enhanced DV-Hop Node Localization Algorithm Based on Nearest Neighbour Distance and Hop-Count Evaluation in WSNs	Kanika Sood (NITTTR, Chandigarh, India); Kanika Sharma (Punjab University, India); Amod Kumar (CSIR-Central Scientific Instruments Organisation, India)	**287**
46	An Exploration of Mis/Disinformation in Audio Format Disseminated in Podcasts: A Case Study of Spotify	Kevin Matthe Caramancion (University at Albany, SUNY, USA)	**294**

47	Same Form, Different Payloads: A Comparative Vector Assessment of DDoS and Disinformation Attacks	Kevin Matthe Caramancion (University at Albany, SUNY, USA)	**300**
48	Mathematical Modeling of Credit Scoring System Based on the Monge-Kantorovich Problem	Kuvonchbek Rakhimberdiev (National University of Uzbekistan Named After Mirzo Ulugbek & Nuuz, Uzbekistan)	**306**
49	Forecasting Model Comparison for Soil Moisture to Obtain Optimal Plant Growth	Sachintha Balasooriya (Kyoto University of Advance Sciences, Japan); Lasith Yasakethu (Sri Lanka Technological Campus, Sri Lanka)	**313**
50	Detection and Quantitative Prediction of Diplocarpon Earlianum Infection Rate in Strawberry Leaves Using Population-Based Recurrent Neural Network	Oliver John Alajas, Ronnie Concepcion II, Argel Bandala, Edwin Sybingco and Ryan Rhay P. Vicerra (De La Salle University, Philippines); Elmer P. Dadios (Philippines, Philippines); Christan Mendigoria, Heinrick Aquino and Leonard Ambata (De La Salle University, Philippines); Bernardo Duarte (University of Lisbon, Portugal)	**320**
51	Lower-Limb Exoskeleton Systems for Rehabilitation And/Or Assistance: A Review	Dana Terrazas-Rodas, Lisbeth Rocca-Huaman, César Ramírez-Amaya and Angel E. Alvarez-Rodriguez (Universidad Tecnológica del Perú, Peru)	**328**

52	Deep Learning: An Empirical Study on Kimia Path24	Shaikh Rahman and Hayden Wimmer (Georgia Southern University, USA); Loreen Powell (Bloomsburg University of Pennsylvania, USA)	**335**
53	Biomechanical Prosthesis With EMG Signal Acquisition for Patients With Transradial Amputation	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Luis Alberto Huamán Lévano (Universidad Continental, Peru)	**344**
54	Bangla Handwritten Character Recognition Method	Lutfun Nahar (International Islamic University Chittagong, Bangladesh)	**351**
55	The Iso-RSA Cryptographic Scheme	Mamadou I Wade (Howard University, USA)	**356**
56	The Iso-ElGamal Cryptographic Scheme	Mamadou I Wade (Howard University, USA)	**366**
57	Connected and Autonomous Vehicles Against a Malware Spread: A Stochastic Modeling Approach	Manal El Mouhib (EI Research Team, Morocco); Kamal Azghiou (Mohammed First University & EI team, Morocco); Abdelhamid Benali (EI Research Team, Morocco)	**374**
58	Cassava Leaf Disease Detection Using Deep Learning	Manick Manick and Jyoti Srivastava (NIT Hamirpur, India)	**380**
59	IoT-Based DDoS on Cyber Physical Systems: Research Challenges, Datasets and Future Prospects	Manish Snehi and Abhinav Bhandari (Punjabi University, India)	**387**

60	Resilience Evaluation of Cyber Risks in Industrial Internet of Things	Mayer Fernandes Silva (Brazil); Herman Lepikson (CIMATEC, Brazil)	**395**
61	Detecting Various Chemical Samples and Cancer Cells With a Bio-Chemical Sensor by Using LNOI Based Optical Micro Ring Resonator (OMRR)	Md Ashif Uddin (Khulna University, Bangladesh); Uzzwal Kumar Dey (Khulna University of Engineering & Technology, Bangladesh); Moriom Akter (Khulna University, Bangladesh)	**401**
62	Proposing A Cloud and Edge Computing Based Decision Supportive Consolidated Farming System by Sensing Various Effective Parameters Using IoT	Md Ashif Uddin (Khulna University, Bangladesh); Uzzwal Kumar Dey (Khulna University of Engineering & Technology, Bangladesh); Moriom Akter (Khulna University, Bangladesh)	**407**
63	Artificial Magnetic Conductor Unit Cell Design Using Machine Learning Algorithms	Tasfia Nuzhat (Chittagong Independent University, Bangladesh); Md Nazmul Hasan (The University of British Columbia, Canada)	**413**
64	Development of an IoT-Based Low-Cost Multi-Sensor Buoy for Real-Time Monitoring of Dhaka Canal Water Condition	Ikbal Hasan, Malobika Mukherjee, Rumi Halder and Farzana Yeasmin Rubina (Independent University, Bangladesh, Bangladesh); Md. Abdur Razzak (Independent University, Bangladesh)	**420**
65	A High Gain Cascaded DC-DC Boost Converter for Electric Vehicle Motor Controller and Other Renewable Energy Applications	Md. Rezanul Haque (Independent University, Bangladesh); K. M. A. Salam (North South University, Bangladesh); Md. Abdur	**426**

		Razzak (Independent University, Bangladesh)	
66	Performance Evaluation of Secured Blockchain-Based Patient Health Records Sharing Framework	Meryem Abouali (City College of New York, USA); Kartikeya Sharma (City University of New York, USA); Oluwaseyi Ajayi (Vaughns College of Aeronautics and Technology, USA & City College of New York, USA); Tarek Saadawi (The City University of New York/The City College, USA)	**431**
67	Input Fuzzing for Network-Based Attack Vector on Smartphones	Hosam Alamleh (University of North Carolina Wilmington & Louisiana Tech University, USA); Micah Noyes (University of North Carolina Wilmington, USA)	**438**
68	Developments Pertaining to the Characteristics of the Sites of HIV Integration Highlighting Its Role in Clinical Research and Its Future With AI: A Review	Minakshi Boruah and Ranjita Das (NIT Mizoram, India)	**442**
69	Design and Development of a Smart Garage Door System	Mohamed Imran Mohamed Ariff and Farah Diyana Mohamad Fadzir (UiTM Cawangan Perak, Kampus Tapah, Malaysia); Noreen Izza Arshad (Universiti Teknologi Petronas, Malaysia)	**449**
70	IronMan: An Android-Web Based Application for Laundry Services	Mohammad Moshfique Uddin, Rohit Roy, Saima Alam Miduri and Rashedur M	**455**

		Rahman (North South University, Bangladesh)	
71	A Brief Overview on Security Challenges and Protocols in Internet of Things Application	Gajjala Savithri (YSR Architecture and Fine Arts University, India); Bhabendu kumar Mohanta (GITAM Deemed to Be University, India); Mohan Kumar Dehury (Koneru Lakshmaiah Education Foundation, India)	**463**
72	Brain Waves Pattern Recognition Using LSTM-RNN for Internet of Brain-Controlled Things (IoBCT) Applications	Mokhles Mawlood Abdulghani (University of North Dakota, Canada); Farah Fargo (Intel, USA); Haider Khaleel Raad (Xavier University, USA); Olivier Franza (Intel, USA)	**470**
73	Low-Power and High Speed SRAM for Ultra Low Power Applications	Neha Meshram and Govind Prasad (IIIT Naya Raipur, India); Divaker Sharma (Jamia Millia Islamia- A Central University, India); Bipin Chandra Mandi (DSPM IIIT Naya Raipur, India)	**475**
74	Smart Home Automation IoT System for Disabled and Elderly	Nesreen Alsbou (University of Central Oklahoma, USA); Naveen Thirunilath (UCO, USA); Imad Ali (University of Oklahoma Health Sciences Center, USA)	**481**
75	IoT-Based Smart Hospital Using Cisco Packet Tracer Analysis	Nesreen Alsbou (University of Central Oklahoma, USA); Dakota Price (UCO, USA); Imad Ali (University of Oklahoma Health Sciences Center, USA)	**486**

76	Simulators and Testbeds for IIoT Development and Validation	Nicholas J Jeffrey (University of Oviedo, Canada); Qing Tan (Athabasca University, Canada); Jose R. Villar (University of Oviedo, Spain)	**492**
77	Image Captioning-Bangladesh's Heritage Perspective Using Deep Learning	Sarowar Alam, Khalidul Islam, Nishat Sharmila, Ziaur Rahman Sovon and Rashedur M Rahman (North South University, Bangladesh)	**497**
78	Audio Band Analog Signal Measurement Instrument for Vocational School Practicum Aids	Nyoman Karna, Ridha Negara, Bagus Aditya and Adinda Fatkhah Gifary (Telkom University, Indonesia); Dewa Rahyuni (Universitas Padjajaran, Indonesia)	**505**
79	Enhancing SARS-CoV-2 Variants Research With Blockchain Architecture	Oluwaseyi Ajayi (Vaughns College of Aeronautics and Technology); Tarek Saadawi (The City University of New York/The City College, USA)	**511**
80	Convolutional Neural Network Structure to Detect and Localize CTC Using Image Processing	Shorouq Al-Eidi (Memorial University of Newfoundland, Canada); Omar Darwish (Eastern Michigan University, USA); Ghaith Husari (East Tennessee State University, USA); Yuanzhu Chen (Queen's University, Canada); Mahmoud Elkhodr (Central Queensland University, Australia)	**518**

81	FPGA Implementation of Phase Recovery Technique for Complex Transforms	Poorvi Bhaskar (SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, INDIA, India); Yuvaraj S (SRMIST, India); Palanisamy P (National Institute of Technology, Tiruchirappalli & NIT, Trichy, India); Thilagavathy R (NIT Trichy, India)	**525**
82	VLSI Implementation of a Real-Time Modified Decision-Based Algorithm for Impulse Noise Removal	Pradyut Kumar Sanki (SRM University-AP, India); Bevara Vasudeva (SRMAP, AMARAVATI, India); Medarametla Depthi Supriya, Devireddy Vignesh, Peram Bhanu Sai Harshath and Sravya Kuchina (SRM University AP, India)	**531**
83	Envisioning A Light-Based Quantum-Computational Nano-Cyborg	Pravir Malik (Deep Order Technologies, USA)	**541**
84	Smart Irrigation Systems: Soil Monitoring and Disease Detection for Precision Agriculture	Premsai Peddi and Anuragh Dasgupta (Birla Institute of Technology and Science Pilani, Dubai Campus, UAE, United Arab Emirates); Vilas H Gaidhane (Birla Institute of Technology and Science Pilani, Dubai Campus, UAE, India)	**549**
85	Bimetals (Au-Pd, Au-Pt) Loaded WO3 Hybridized Graphene Oxide FET Sensors for Selective Detection of Acetone	Radha Bhardwaj (BITS, Pilani, India)	**556**

86	Intelligent Reflecting Surfaces in UAV-Assisted 6G Networks: An Approach for Enhanced Propagation and Spectral Characteristics	Mobasshir Mahbub (Ahsanullah University of Science and Technology, Bangladesh); Raed Shubair (New York University (NYU) Abu Dhabi, United Arab Emirates)	**561**
87	Intelligent Reflecting Surfaces for Multi-Access Edge Computing in 6G Wireless Networks	Mobasshir Mahbub (Ahsanullah University of Science and Technology, Bangladesh); Raed Shubair (New York University (NYU) Abu Dhabi, United Arab Emirates)	**567**
88	Probing the States Around the Charge Neutrality Point of Reduced Graphene Oxide With Time-Resolved Gated Kelvin Probe Force Microscopy	Ragul S (Sardar Patel Road & IIT Madras, India); Soumya Dutta and Debdutta Ray (Indian Institute of Technology Madras, India)	**572**
89	Broadband Printed Dipole Antennas	Rajendra Ghosh (Vidyasagar University, India)	**579**
90	SQL ChatBot - Using Context Free Grammar	Rajvardhan Patil, Sorio Boit and Nathaniel Bowman (Grand Valley State University, USA)	**587**
91	Multiobjective Optimal Control of Power Electronic Loads in Small Scale Power Systems	Ramitha Kalhara Dissanayake (University of Peradeniya, Sri Lanka); Amal Wimalarathna (RMIT University, Australia); Anushka Dissanayake (Schweitzer Engineering Laboratories, USA)	**594**

92	Explicite Model of a Wheel-Soil Interaction Over a Rough Terrain Using Terramechanics Low	Rania Majdoubi (Mohammed V University in Rabat & LCS Laboratory, Faculty of Sciences, Mohammed V University in Rabat, Morocco)	**600**
93	Optimal Inventory Policy in Oil Transportation: A Case Study	Rasha Kashef (Ryerson University, Canada); Shuo Xu (Adastra North America, Canada)	**607**
94	Simulating Software Support Delays in a 24/7 Environment Using Discrete Event Simulation	Rasha Kashef (Ryerson University, Canada); Shabbir Mirza (TD Canada Trust, Canada)	**613**
95	Intelligent Feature Selection on Multivariate Dataset Using Advanced Data Profiling	Ritu Chaturvedi (University of Guelph, Canada); Vandana Patnaik (Mass General Brigham, Boston, MA, Canada)	**619**
96	Optimization of Subsurface Imaging Antenna Capacitance Through Geometry Modeling Using Archimedes, Lichtenberg and Henry Gas Solubility Metaheuristics	Adrian Genevie G. Janairo, Jonah Jahara Baun, Ronnie Concepcion II, R-jay Relano, Kate G Francisco, Mike Louie Enriquez, Argel Bandala, Ryan Rhay P. Vicerra and Melchizedek Alipio (De La Salle University, Philippines); Elmer P. Dadios (Philippines, Philippines)	**626**
97	Employing Nonlinear Model Based PI Like Controller for the Time Varying System	Atanu Panda (IEM, India); Samrat Banerjee and Indrajit Pandey (Techno International New Town, India); Parijat Bhowmick (IIT Guwahati, India)	**634**

98	A Novel Multifaceted Deep Learning-Based Mobile Application for Accurate and Efficient Waste Classification and Increased Composting Engagement in Communities	Samyak Shrimali (Jesuit High School, USA)	**638**
99	Remote Elemental Analysis System for Liquid Using Sonoluminescence	Sardini Sayidatun Nisa Sailellah, Hideharu Takahashi and Hiroshige Kikura (Tokyo Institute of Technology, Japan)	**643**
100	Detailed Bond Graph Modeling of PV-Battery System	Sayed Arash Omidi, Rideout Geoff and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**649**
101	Design and Simulate a 500 MW Grid-Connected PV Farm for Labrador	Sayed Arfat Alam Quadri, Mohamad Mahdi Baalbaki, Andrew Chacko and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**656**
102	Coordinated Motion and Force Control of Multi-Rover Robotics System With Mecanum Wheels	Serdar S Kalaycioglu (Toronto Metropolitan University & Canadian Space Research Inc., Canada)	**664**
103	Analysis of the Influence of Factors on Flight Delays in the United States Using the Construction of a Mathematical Model and Regression Analysis	Sergei Kurashkin, Timofey Kireev, Vladislav Kukartsev, Alesya Pilipenko, Anastasiya Rukosueva and Viktor Suetin (Reshetnev Siberian State University of Science and Technology, Russia)	**673**

104	Construction of a Factor Model Focused on the Reduction of Difficulties in Road Traffic	Sergei Kurashkin, Natalia Fedorova, Aleksander Myrugin, Elena Filushina, Yuriy Seregin, Elena Vaitekunene and Yuriy Danilchenko (Reshetnev Siberian State University of Science and Technology, Russia)	**678**
105	Theoretical Foundations of the Development Strategy of the Organization for the Production of the Refrigeration Equipment	Sergei Kurashkin, Aleksander Myrugin, Elena Filushina, Yuriy Seregin, Natalia Fedorova, Elena Vaitekunene and Dmitrij Eremeev (Reshetnev Siberian State University of Science and Technology, Russia)	**684**
106	Methods and Tools for Developing an Organization Development Strategy	Sergei Kurashkin, Vladislav Kukartsev, Elizaveta Shutkina, Kristina Moiseeva, Ekaterina Volneikina and Timofey Kireev (Reshetnev Siberian State University of Science and Technology, Russia)	**691**
107	Practical-Oriented Method of Development of Strategy of Development of a Production Enterprise	Sergei Kurashkin, Vladislav Dmitriev, Kristina Moiseeva, Alexander Korostelev and Alexander Stashkevich (Reshetnev Siberian State University of Science and Technology, Russia)	**699**
108	Road Map "TechNet" National Technological Platform	Sergei Kurashkin (Reshetnev Siberian State University of Science and Technology, Russia); Alena Stupina (Siberian Federal University, Russia); Natalia Fedorova, Yuriy Danilchenko, Dmitrij	**706**

		Eremeev, Elena Vaitekunene and Yuriy Seregin (Reshetnev Siberian State University of Science and Technology, Russia)	
109	Analysis of Data in Solving the Problem of Reducing the Accident Rate Through the Use of Special Means on Public Roads	Sergei Kurashkin and Vladislav Kukartsev (Reshetnev Siberian State University of Science and Technology, Russia); Anton Mikhalev (Siberian Federal University, Russia); Alexander Stashkevich, Kristina Moiseeva and Igor Kauts (Reshetnev Siberian State University of Science and Technology, Russia)	**713**
110	Establishment of a Model for Managing Organizational Attendance Based on Data Analysis	Sergei Kurashkin and Viktor Suetin (Reshetnev Siberian State University of Science and Technology, Russia); Anton Mikhalev (Siberian Federal University, Russia); Alexander Korostelev (Reshetnev Siberian State University of Science and Technology, Russia); Vladimir Grishko (Siberian Federal University, Russia)	**717**
111	Using UML to Describe the Development of Software Products Using an Object Approach	Sergei Kurashkin and Evgeniya Semenova (Reshetnev Siberian State University of Science and Technology, Russia); Vadim Sergeevich Tynchenko (Reshetnev Siberian State University of Science and Technology & Siberian Federal University, Russia); Sofya Chashchina,	**723**

		Viktor Suetin and Alexander Stashkevich (Reshetnev Siberian State University of Science and Technology, Russia)	
112	IoT-Based Cyber-Physical Distribution System Planning	Shaben Kayamboo and Biplob Ray (Central Queensland University, Australia); Narottam K. Das (CQUniversity Australia, Australia); Mary Tom (Central Queensland University, Australia)	**727**
113	The Million Improvised Electric Rickshaws in Bangladesh; Preliminary Survey and Analysis	Shahriar Khan (Independent University, Bangladesh)	**733**
114	The USB Powered Miniature Tesla Coil, With the Filament Bulb, Fluorescent Lamp and Discharge to Body	Shahriar Khan (Independent University, Bangladesh); Simoom Rahman (Independent University, Bangladesh, Bangladesh)	**740**
115	The Improvised Three-Wheeler Electric Vehicle Solutions in Bangladesh: Equipment and Experimental Waveforms	Shahriar Khan (Independent University, Bangladesh)	**747**
116	The Small 3-Wheeler Electric Vehicle Solutions in Bangladesh; Survey, Progress and Documentation	Shahriar Khan (Independent University, Bangladesh)	**754**
117	Analog Front-End CMOS Temperature Sensor	Shahrzad Mohammad Ghasemi and Soliman	**762**

	Interface for Optogenetic Devices	Mahmoud (University of Sharjah, United Arab Emirates)	
118	A High-Order Temperature-Compensated Bandgap Voltage Reference With Low Temperature Coefficient	Shalin Huang, Mingdong Li, Peng Yin and Fang Tang (Chongqing University, China)	**767**
119	FPGA Implementation of Artificial Neural Network(ANN) for ECG Signal Classification	Shatharajupally Vinaykumar (NIT, Trichy, India); Thilagavathy R (NIT Trichy, India)	**772**
120	Dynamic Modelling and Analysis of Solar Powered Reverse Osmosis Desalination System for Pakistan Using the Bond Graph Model	Sheikh Usman Uddin and Rideout Geoff (Memorial University of Newfoundland, Canada)	**778**
121	Design and Analysis of a Solar Powered Water Filtration System for a Community in Black Tickle-Domino	Sheikh Usman Uddin, Onyinyechukwu Chidolue, Abdul Azeez and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**784**
122	Reconfigurable Star-Delta VBR Induction Machine Model for Predicting Soft-Starting Transients	Sheraz Baig and Taleb Vahabzadeh (The University of British Columbia, Canada); Seyyedmilad Ebrahimi and Juri Jatskevich (University of British Columbia, Canada)	**790**
123	Comparative Analysis of Deep Learning and Machine Learning Techniques for Power	Sivaramarao Bodda and Anjali Thawait (IIT Bhilai, India); Prashant Agnihotri (Indian	**797**

	System Fault Type Classification and Location Prediction	Institute of Technology Bhilai, India)	
124	Accident Analysis and Severity Prediction of Road Accidents in United States Using Machine Learning Algorithms	Maryam Heidari, Sri Siddhartha Reddy, Yen Ling Chao and Lakshmi Praneetha Kotikalapudi (George Mason University, USA)	**806**
125	Dynamic Simulation of a Microgrid System for a University Community in Nigeria	Stephen Ogbikaya and Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	**813**
126	Design of a Computer Stereo Vision Based Road Marking System	Surya Kant (National Institute of Technical Teachers Training and Research, India); Amod Kumar (CSIR-Central Scientific Instruments Organisation, India); Garima Saini (NITTTR, India)	**820**
127	A Machine Learning Approach for the Early Detection of Dementia	Sven Broman, Elizabeth O'Hara and Md L Ali (Rider University, USA)	**827**
128	Semantic Segmentation Using Modified U-Net for Autonomous Driving	T Sugirtha (National Institute of Technology Tiruchirappalli Tamilnadu India, India); M. Sridevi (National Institute of Technology, India)	**833**
129	Performance Analysis of a New Non-Contact, Potentiometric Angle Sensor	Utpol Tarafdar (National Institute of Technology, Calicut, Kerala, India); Mithun Sakthivel (National Institute of Technology Calicut, India)	**840**

130	Identifying Functional and Non-Functional Software Requirements From User App Reviews	Dev Dave and Vaibhav Anu (Montclair State University, USA)	**847**
131	Studying-Alive: A Holistic Wellness Application for College Students	Natasia Fernandez and Vaibhav Anu (Montclair State University, USA)	**853**
132	A Review of Cognitive Dynamic Systems and Its Overarching Functions	Waleed Hilal, Alessandro Giuliano and Stephen Andrew Gadsden (McMaster University, Canada); John Yawney (Adastra Corporation, Canada)	**860**
133	Balancing Sampling Frequencies for Multi-Modality IoT Systems: Smart Shoe as an Example	Wenwu Deng (University of Science and Technology of China, China); Kangyu Chen (The First Affiliated Hospital of USTC, China); Qijun Ying and Jingyuan Cheng (University of Science and Technology of China, China)	**870**
134	Enhanced Photon Detection Probability Model for Single-Photon Avalanche Diodes in TCAD With Machine Learning	Xuanyu Qian, Wei Jiang and M. Jamal Deen (McMaster University, Canada)	**877**
135	Design of an Automated Manure Collection System for the Production of Biogas Through Biodigesters	Jhon Rodrigo Ortiz Zacarias, Iraiz Quintanilla Mosquera, Jesus Eduardo Rosales Fierro, Sliver Del Carpio Ramirez, Carlos Coaquira Rojo, Yadhira Samhira Valenzuela Lino and Nabilt Moggiano (Universidad Continental, Peru)	**883**

136	Design of an Automated Feeding and Drinking System for Turkeys at Different Stages of Their Development	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Yadhira Samhira Valenzuela Lino, Jesus Eduardo Rosales Fierro, Jhon Rodrigo Ortiz Zacarias, Nabilt Moggiano and Carlos Coaquira Rojo (Universidad Continental, Peru)	**889**
137	Automated Design of a Cleaning Machine and an Environmental Temperature Controller for Guinea Pig Houses	Jhon Rodrigo Ortiz Zacarias, Yadhira Samhira Valenzuela Lino, Yossef Rojas Tapara, Sliver Del Carpio Ramirez, Carlos Coaquira Rojo and Frank Zarate Peña (Universidad Continental, Peru)	**895**
138	Machine Learning Performances for Covid-19 Images Classification Based Histogram of Oriented Gradients Features	Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Wikan Tyassari (University of Muhammadiyah Yogyakarta, Indonesia); Difa Nisrina, Fahrul Galih Santosa and Nugroho Abdi Prayitno (Universitas Muhammadiyah Yogyakarta, Indonesia)	**900**
139	Multilayer Aperture Coupled Single Band Second Order Bandpass Patch Resonator	Mohan K N (Vellore Institute of Technology, Vellore, India); Yogesh Kumar Choukiker (VIT University, India)	**906**
140	Analysis and Evaluation of A Eod Robot Prototype	Yuri L. Silva, Elvis Supo, Milton Amadeo Ccallata, Jesús Mamani, Mario Betancur, Brunno Pino, Pablo Pari and Erasmo Sulla (Universidad	**910**

		Nacional de San Agustín de Arequipa, Peru)	
141	A Model of Classification of Consumers on the Retail Electricity Market	Aleksandr V. Belov and Maria Monina (National Research University Higher School of Economics, Russia); Zhenisgul Rakhmetullina (D. Serikbayev East Kazakhstan State Technical University, Kazakhstan)	**916**
142	Ontology Construction of City Hotline Service for Urban Grassroots Governance	Zuohai Chen (Qilu University of Technology, China)	**922**
143	Leg Geometry Optimization of Thermoelectric Cooler to Maximize COP Through Gaussian Process Modelling	Ethan Robyn V. Ebuen, La Verne Certeza, Johannes Kurt Tecson, Jowen Louis Francisco, Carl Vincent Villanueva and Jomar Lord Cauton (University of Santo Tomas, Philippines)	**932**
144	A Sliding Mode Based Finite Time Consensus Protocol for Heterogeneous Multi Agent UAS	Madhumita Pal (Institute of Engineering & Management, Kolkata, India); Titas Bera (Tata Consultancy Services, India)	**941**
145	Improving Accessibility of Remote Drone Control With a Streamlined Computer Vision Approach	Evan Lowhorn (Georgia Southern University, USA)	**948**
146	Terminal Sliding Mode Control(TSMC) Based Cooperative Load	Subhojit Das (Institute of Engineering & Management, India); Madhumita Pal	**953**

	Transportation Using Multiple Drones	(Institute of Engineering & Management, Kolkata, India); Sagnik Banerjee, Souhardya Das, Rishav Kumar, Sudhanshu Shekhar and Shreyan Ghosh (Institute of Engineering & Management, India)	
147	Mechanical and Electronic Design of a Prototype of a Modular Exoskeleton for Lower-Limbs	Deyby Huamanchahua (Universidad de Ingeniería y Tecnología - UTEC, Peru); Yerson Taza Aquino (Universidad Continental, Peru)	**962**
148	Intelligent Monitoring and Control of Wind Turbine Prototype Using Internet of Things (IoT)	Pallav Dutta, Md Jishan Ali and Ashim Mondal (Aliah University, India)	**968**
149	Machine Learning models for Customer Relationship Analysis to Improve Satisfaction Rate in Banking	Maryam Heidari (George Mason University, USA)	**974**
150	A Survey on the Jamming and Spoofing Attacks on the Unmanned Aerial Vehicle Networks	Faisal Alrefaei (Embry-Riddle Aeronautical University, USA); Abdullah Alzahrani (Oakland University, USA)	**983**
151	Analyzing Credit Card Fraud Detection based on Machine Learning Models	Maryam Heidari and Arthi Reddy Kotha (George Mason University, USA)	**990**
152	Use Machine Learning Technologies in E-Learning	Taslina Akter (IUB, Bangladesh)	**998**