2024 12th International Electrical Engineering Congress (iEECON 2024)

Pattaya, Thailand 6-8 March 2024



IEEE Catalog Number: ISBN:

Number: CFP2402X-POD 979-8-3503-8360-7

Copyright © 2024 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:
 CFP2402X-POD

 ISBN (Print-On-Demand):
 979-8-3503-8360-7

 ISBN (Online):
 979-8-3503-8359-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Phone: (845) 758-0400 Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



Contents

Paper I	D	Page
Commi	unications	
P03261	Tracking of Automated Guided Vehicle with 5G and UWB Real-Time Location System in Smart Factory	2
P03264	Enhancing Antenna Gain and Radiation Patterns through the Investigation of Chiral Metamaterials	6
P03266	Train Collision Avoidance System by X-Band FMCW Radar and Long Range Camera Image Processing	11
P03267	Design and Optimization of Single-Shunt Diode RF Rectifier Using Electromagnetic Co-Simulation	15
P03277	Analyzing S-Parameter Variations in Metamaterials: The Impact of Varying Incident Angles for Electromagnetic Waves	19
P03284	Pilot-Assisted Channel Estimation for SFBC MIMO-OFDM with Index Modulation in Higher Time-varying Fading Channel	25
P03286	Novel Bandpass and Periodic Frequency Responses in Non-Metallic Dielectric Metamaterials	29
P03287	Exploring CST Simulation Techniques for TEM Mode and Unit Cell Analysis to Determine Refractive Index	33
P03444	Estimation of Object Position and Orientation for Dimmable Visible Light Positioning	39
P03666	Development of 5G Standalone QOS Tester Device for CAV Communication	44
P03680	SUTH-BME-FindmE: Determine Real Time Position of Medical Devices in a Large Hospital	49
P03685	FPGA Implementation of IFFT-2048 Points for High Speed Transmitter OFDM Communication Systems with 64-QAM Mapping	53
P03703	Broadband Fabry—Perot Cavity Antenna with Two-Layer Partially Reflective Surface Using Periodic Structures	57
P03712	Performance Analysis of 5G OFDM Frame Synchronization with Various Channel Conditions	61
P03715	Implementation of 5G Network Slicing Using Open Source Software	65

Paper I	D	Page
P03873	Visual Vibration Sensor of an Electromechanical System Using a Mach-Zehnder Interferometer	71
P03925	Small Loop Antenna Arrangement Investigation for 350 kHz Through-the-Earth Communications in Limestone Cave	75
P03958	Pragmatic Design of a Rectangular Printed Dipole Array Antenna for 5G Base Station	79
P03963	Sequential Channel and Phase Noise Equalization for 5G OFDM Communication Systems	84
P04256	A DGS-Based Ultra Wideband THz MIMO Antenna for Wireless Communication	88
P04257	A Compact Two-Element UWB MIMO Antenna With Improved Isolation Using Parasitic Elements	N/A
P04369	Evaluation of Trickle Timer under Uncertainty Channel	97
P04411	Waveguide Diplexer Design using MATLAB GUI for Microwave Engineering Education	101
P04245	High Signal Isolation Dual-mode Diplexer using Square Loop Resonator with Tuning Stub	105
P04246	Dual-mode Dual-band Filter Using Stepped-impedance Resonator with Outer Tuning Plus-sign	110
P04468	Single-mode Dielectric Resonator Bandpass Filter without Internal Coupling Iris	114
Electro	nics & Control	
P03230	Transformable Furniture Design by Geometric Transformations with an Engineering Approach	120
P03235	An Automatic U-turn Machine System Module using Stepper Motor and PLC on Cloud Control	124
P03246	The Fault Detection Method Based on Fuzzy Logic for Boost Converters	128
P03254	The Fault Detection Method for a DC Traction Rectifier Substation in Mass Rapid Transit Railway Systems	132
P03268	Computational Study of the Interaction Between Alkali Metal Ions and Graphene by DV-Xα Method	138

Paper I	D	Page
P03283	Testability Considerations for Custom Processing-In-Memory Cores	142
P03401	Optimization for Initialization in Unfalsified Control	146
P03428	Improvement of Renz's Active Band-Pass Filter Using Uniformly Distributed RC Circuit	150
P03430	Development of Autonomic Docking Algorithm for Autonomous Mobile Robots by Integrated with Behavior Tree	155
P03649	A New Technique of Soluble NPK Nutrient Detection System Using Deep Learning-based Recurrent Neural Networks (RNN)	160
P03661	Construction of Position Telecontrol for Haptic Device Based on an Omnidirectional Mobile Robot	164
P03704	Automated Voltage-Ratio Measurement for Resistance Calibration	170
P03708	Mathematical Modeling and Analysis of Permanent Magnet Synchronous Motor in Quaternion Space	174
P03709	Calibration based on Polynomial Function for Low-Cost Sensors: A Case Study of Air Purifier Filter	180
P03714	Optimal Number of Wires for Circuits on RTL-Designed FPGAs	184
P03726	Models of Virtual Battery Systems and Electric Grid Networks to Support a National Energy Trading Platform and Prosumer Integration	188
P03929	Non Voltage Feedback Bluetooth Power Supply	194
P03944	Magnetic GAA (MAG-GAA) for Vertical and Horizontal Magnetic Field Detection	198
P03957	The Monitoring and Controlling of Wireless Communication with PLC via Internet access	203
P03972	Electrical Properties of BCZT Ceramics modified using nanocrystals seed	N/A
P04133	The Memristor's with Microcontroller and Digital to Analog Converter Module MCP4725	216
P04151	Thrust Reverser and Air Balance Analysis with a Microcontroller through a System that Simulates the Rotation of a Jet Engine	221
P04175	Thermal Insulated Leakage Current Measurement using a Fluxgate Sensor with an Aerogel Insulation for DC Charging Applications	225

Paper I	D	Page
P03913	The Study Boost Single-Phase PFC Converter for Induction Heating Applications	231
P04198	Electronically Tunable High Pass Filter - Based MSO Employing VD-DIBAs	235
P04347	Negative Pressure Cabinet Air Filter Efficiency Alarm System Using Differential Pressure Sensor	239
Digital	Signal Processing	
P03257	Automated Counting of Giant River Prawn Larvae Using Machine Vision	244
P03258	Differentiating Analysis of Beef, Pork, Bovine Blood, and Porcine Blood via Electronic Olfaction Technology	248
P03259	Non-invasive Egg Monitoring Using Machine Vision Technology for Distinguishing Fertilized and Untilized Eggs	252
P03260	Automated Stomatal Detection and Enumeration Using Machine Vision Techniques	256
P03269	Bag of Tricks Toward Enhanced Shuttlecock Detection from Badminton Videos	260
P03273	A vision-based autonomous AI tic-tac-toe manipulation system	266
P03276	VGGNet Integration for Kidney Tumor Classification	270
P03279	Temporal Keyframe Technique Based on CNN and LSTM for Enhancing Lip Reading Performance	276
P03303	Application of Adaptive Image Enhancement Method for Mammogram Enhancement	281
P03431	Determining Banana Ripeness Using MobileNet	287
P03432	Mango Maturity Classification Using VGG16	292
P03433	Classification of Snatch Weightlifting Phases	297
P03442	Deep Convolutional Neural Networks for Accurate Solar Module Classification in Thermal Images	302
P03445	Improved Modified Plain Gradient Adaptive IIR Notch Filter for Frequency Estimation	307

Paper I	D	Page
P03692	Cucumber Disease Identification Using Multiple Machine Learning Classifiers with a Pre-trained VGG16 Model	309
P03693	A Study on the Potency of Hybrid Models: Detecting Diseases in Cucumber Leaves with Pre-trained CNNs and SVM	313
P03707	A Comparative Study of Heart Sound Denoising Using Adaptive Line Enhancer with LMF Algorithm	317
P03719	Effect of Class Weights on Imbalanced Classes in Bi-directional LSTM Training for Sleep Apnea Classification	323
P03849	The Development for Diabetic Retinopathy Lesion Detection on Fundus Photography	329
P03914	Adaptive Orthogonal Gradient Algorithm Based on Fair Cost Function	333
P04002	Meteorological Prediction using Cloud's Images	337
P04309	Monitoring Respiration Activity with Bulk Conductivity in a 16-electrode Configuration	341
P04310	Imaging Conductivity Distribution of Ventilation with Single-frequency and Frequency-difference Electrical Impedance Tomography	345
P04368	Automated Surface Cleaning Evaluation Algorithm	350
P04401	The Optimum Switching Bilateral of Various Mix Noise Filters to reduce Medical X-Ray Images	354
P04423	Noise Detection Capability Exploration of Three Variance Principle and Local Stochastic For High Fix Value Impulsive Noise	358
P04424	The Eccentricity Revelation Mechanism based on FONDBMF for Consistent Sizableness Impulsive Outlier (CSIO)	362
P04425	The Efficaciousness of the Outlier Reclamation Scheme Established on a First-Order Recursive FIR Linear Predictor for Salt&Pepper Outlier	366
Power	& Energy	
P03238	Evaluation of Tea Leaf Disease Identification Based on Convolutional Neural Networks VGG16, ResNet50, and DenseNet169 Image Recognitions	372

Paper I	D	Page
P03248	Nighttime Energy Management Strategy of All-Electric Ship during Berthing	376
P03249	Fuse-Saving Strategy Using Back-to-Back Converter for Microgrid	381
P03251	The DC Voltage Controller Design of Traction Substation in Heavy Rail Systems	386
P03256	The Harmonic Mitigation for Heavy Rail Systems Using Shunt Active Power Filter	390
P03270	Generation Maintenance Scheduling Considering Carbon Tax and Social Cost	396
P03272	Harmonic Elimination of AC Electric Railway Systems Using Shunt Active Power Filters	400
P03281	Open Source Dynamic Simulation Techniques of the Sixth Order Model of Synchronous Machine	406
P03355	Low-Cost Battery Capacity Tester with Online Monitoring for Educational Use	410
P03446	Improved three-level boost converter to balance duty cycles for fuel cell and photovoltaic applications	415
P03447	Generalization of Modular Three-level Buck Converter	421
P03453	The PI Control for a Boost Derived Hybrid Converter to Supply DC and AC Loads	427
P03458	Design and Experimental Verification of an Integrated Boost-Flyback Converter with Voltage Multiplier	432
P03477	Developing Smart IoT Systems to Control Peak Demand Energy Using ESP8266 for Split Type Air Conditioners	436
P03495	The Mathematical Model Analysis of PV Panel Using Python	441
P03557	DC-DC Buck Converter with Adaptive Gain for Improving Line Transient Response	446
P03687	Oscillation Source Identification Using Dissipating Energy Flow in Northeastern Thailand Power Grid	450
P03702	Effect of Span 80 Surfactant in Transformer Oil-Based TiO ₂ Nanofluids on the Electrical Properties of Lightning Impulse Voltage	456
P03727	Implementation of Photovoltaic Power Maximization through Dynamic Power and Current Control	460

Paper I	D	Page
P03758	The fabrication of the electrospun Polyvinylidene fluoride (PVDF) hollow structure fibre for energy harvesting applications	464
P03868	Experimental Study of Dynamic Wireless Battery Charging System for Electric Vehicles	470
P03871	Microgrid Voltage Stability Indices Improvement Using Particle Swarm Optimization	475
P03872	Optimal Daily Scheduling of Hybrid Wind-Hydrogen Storage Using Particle Swarm Optimization	481
P03875	Smart Home Energy Management Algorithm for TOU-based Demand Response	487
P03876	Optimal EV Charging Control for Distribution System Loss Minimization	492
P03888	An Evaluation of ANFIS Controller for Photovoltaic MPPT using Zeta Converter	497
P03889	Small-Signal Stability Analysis in an Uncertain Microgrid with Distributed Energy Resources: A Data-Driven Monitoring	501
P03894	Power Pool vs P2P Energy Trading Mechanisms: A Social Welfare Perspective	507
P03922	Improving Input Voltage Transient Response in Voltage Mode Control of DC-DC Boost Converter	512
P03932	Modelling of Power System Restoration of a Synchronous Generator-Driven Network	517
P03937	Analysis of Constant Switching Frequency Quasi-Resonant ZVS-ZCS Boost Converter using State-Plane Diagram	523
P03941	Magnetic fields simulation of underground power transmission lines multiple systems using 3-D FEM	529
P03942	Forecasting EV Market Trends in India: A Deep Learning Approach for Two/Three-Wheelers	533
P03943	A Multi-Level Inverter using Single-Carrier PWM and DC Levels shifting	539
P03945	Magnetic Field Simulation of Multiphase Wind Generator Using 3D Finite Element Method	543
P03948	Fault Type Classification in the Electric Distribution System Integrated Electric Vehicle Charging Demand	547

Paper I	D	Page
P03951	Development of Innovative Virtual Media Set for Learning Renewable Energy	552
P03953	Ozone Treatment Strategies for Efficient Color Removal in Wastewater	556
P03956	Parallel Class-E Resonant Inverters with a Common EMI Filter for Domestic Induction Cooker	560
P03969	Development and design battery electrode by Fe_2O_3 as active material coted on fiber paper	564
P03986	Optimizing Maximum Profit for Electric Vehicle Users in a Bipolar DC Distribution Grid with Probabilistic EV Load Demand and V2G Integration	568
P04028	Optimal Load Scheduling for Smart Home Energy Management Using Deep Reinforcement Learning	574
P04209	A Data-Driven Approach for Event Detection in Distribution Systems using Micro-PMU Measurements	578
P04229	Reducing Electricity Cost in The Setup Process of Pipe Fittings using ECRS Technical	583
P04290	An Investigational Grid-Tied Inverter Efficiency Analysis of 61.04 kW in PV System	N/A
P04337	Analytical Models and Evaluation for Novel Multi-stage Flywheel Configurations for Grid-connected Wind Power Applications	593
P04351	Evaluation of Efficiency Enhancement for a Solar Panel using Water, Ice and Dry Ice Backside Cooling Systems	599
P03713	Hybrid Power Management with Fuzzy Logic	603
P03811	Investigation of Fuel cell tied Unified Filter towards grid resilency for future smartgrid	608
P03933	Study of Class E Inverter for Induction Heating in High Temperature	615
P03952	An Induction Heater using Half Bridge Resonant Inverter for Coffee Bean Roaster	619
P04207	LED light bulb brightness adjuster using Buck Converter for vegetables growing	623
P04340	Coffee Bean Solar Drying using Humidity and Temperature Control	N/A

Paper I	D	Page
Compu	iter & IT	
P03247	Water Level Monitoring and Flood Alerting by Applying IoT	632
P03262	Enhancing Trading Strategies Through Multi-MA Analysis: A Comprehensive Study on Trend Identification Techniques	636
P03263	Eliminating Insignificant Periods in Forex Analysis for Accurate Results	640
P03265	Enhancing Portraiture: Analyzing the Gap Between Amateur and Professional Photography to Bridge the Divide for High-Quality Self-Portraits	645
P03274	Implementation of Cloud Computing and Internet of Things (IoT) by Performance Evaluation	650
P03382	Applied Depthwise Separable-based Convolutional Neural Network Classification on MobileNet Algorithm for Human Fall Detection	656
P03413	Enhancing Urban GPS Navigation: A Solution Through Image-Based Guidance	N/A
P03414	Revolutionizing Dota 2 Viewing: Automated Battle Highlights in Esports Videos	665
P03416	Introducing BKritt: A High-Performing Trading Strategy with Exceptional Risk-Reward Ratio and Robust Risk Management	N/A
P03417	Predicting Dota 2 Game Period Winners through Hero Analysis	673
P03419	Deep Learning for Forex Trading: Leveraging Keras Sequential Models and Optimized Features to Maximize Profitability	678
P03429	Thai-English Name Matching Using Google Translation and Thai Romanization	683
P03448	Analyzing the Growth of Very Small Power Producers (VSPP) and Energy Demand Prediction in Thailand	687
P03449	Hybridization Harris Hawk Optimization and $\beta\text{-hill}$ climbing for Voxel Selection in Brain Decoding	693
P03450	Energy Consumption Analysis of NB-IoT for Very Large Sensors	699
P03518	Improved Neural Network Predictions with Correlation-Based Subset Selection	703

Paper ID		Page
P03538	Exploring Accurate and Error-Reducing Techniques for Calculating Support and Resistance Prices on Forex Charts	709
P03689	Modified Feature Selection with BPSO to apply PSO for solving Handwritten Digits	714
P03716	Analyze and Predicting with Data Mining on Customer Churn Dataset	720
P03722	Unleashing Hidden Business Insights: Harnessing Unstructured Big Data through Text Analysis, NLP, and Visualizations for Budgetary Decisions in Governmental Organizations	725
P03730	Algorithm to Identify Peaks in Trading Charts	731
P03886	Development of a Discord Bot for Educational Support: Automating Student Score Recording, Homework File Storage, And Classroom Management	N/A
P03918	HTTP/2 Web Performance Characteristics with Link-aggregation Mode under DDoS Attack	739
P03946	Machine Learning Application for Precise Identification of Defective and QC-Approved Tablets in Pharmaceutical Manufacturing	743
P03949	Comparing the Coordinate-Sequencing for Human's Joints Models on Thai Finger Spelling	748
P03950	Deep Multimodal-Based Recognition of Thai Finger Spelling with Two-Handed Postures	753
P04108	Empirical Evaluation of Machine Learning Techniques for Autism Spectrum Disorder	759
P04408	Selective Aggregation of Deep Convolutional Features for Archeological Artifact Retreival	764
P03729	Data Analytics and Machine Learning Approach for Tsunami Prediction from Satellite and Hydrographic Data	770
P04139	CRF-Named Entity Recognition Model for Ancient Isan Medicine Texts	776
Industrial Technology		
P03934	Dynamic Plasma Treatment in Flowing Water: A Transformative Approach to Wastewater Treatment	782

Paper I	D	Page
P04181	Surface Roughness of Electrical Terminal Blocks in the Plastic Injection Process	786
P04255	Influence of Processes Parameter on the Machinability of Wire Electrical Discharge Machining for Tool Steel Grade JIS SKD 11	790
P04331	Development and Evaluation of the Efficiency of a Stainless Steel Electrostatic Outdoor Air Purifier	795
Special	Session	
P03255	Deployable Wideband Circularly Polarized S-Band Antenna Array for CubeSat Applications	802
P03673	A Compact Inverted C Patch On-body Antenna for Biomedical Applications	805
P04011	Design of All Textile Ultra-Wideband Monopole Antenna for Wearable Applications	809
P04034	A Study on 1D-Point Cloud Using Through-Wall mmWave Radar for Human Pose Estimation	813
P04210	Numerical Integration Study for Spherical Near-Field to Far-Field Transformations	817
P04215	Implementing Dual-Inverted L-Shape Grooves on the Dual-Band Monopole Antenna for Portable WiFi, WiMAX, and 5G Applications	821
P04280	Unmilled Rice Moisture Content Sensor for Rice Mill Factory Applications	825
P04427	Design of A Rotated 3D-Printed Lens Antenna Assembly with An Ultra-Wideband Antenna for Beam Steering Applications	829
Other		
P03282	A Simple Real-time Traffic Light Control System using PLC	834
P03369	A Robotic Arm for Sorting Metals and Non-metals Controlled by PLC and Microcontroller	838
P03710	Development of the Function Check Stability of Digital Media Receivers using Interference Mitigation Techniques	843
P03883	IoT System for Greenhouse Monitoring	847

Paper ID		Page
P04281	Sintering of Cu-TiCN Electrode Materials for Electrical Discharge Machining Process	853
P04282	Electrical Discharge Machining Process on Tungsten Carbide Using Copper Titanium-Nitride Electrode Materials	857
P04277	Study on the Slope Diffraction from a Planar Material Junction by Using an Approximate UTD Ray Solution	863
P04703	Automatic Waste Sorting Machine Control Work with Microcontroller ESP32	N/A