2023 20th International Multi-Conference on Systems, Signals & Devices (SSD 2023)

Mahdia, Tunisia
20-23 February 2023

Pages 1-536

IEEE Catalog Number: CFP2322E-POD
ISBN: 979-8-3503-3257-5

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:	CFP2322E-POD
ISBN (Print-On-Demand):	979-8-3503-3257-5
ISBN (Online):	979-8-3503-3256-8
ISSN:	2474-0438

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

5G Wireless Communications Performance Enhancement-Based VANET Technology 1
Omar R. Daoud, Qadri J. Hamarsheh, Ahlam A. Damati

Design of Antenna for 5G Applications at 80 GHz 6
Neila Kammoun, Sabri Beldi, Ali Gharsallah

A New Multi-Access Technique OFDMA-RL for Remote Lab System 9
Elmissaoui Taoufik, Onyedeke Obinna Cyril, Agbo Jonathan Chukwunwike, Obayi Adaora Angela, Emmanuel C. Nwangwu

Multi-Parallel Processing Based OFDM for Combatting PAPR 14
Ali T. Al-Khawaldeh, Saleh S. Saraireh, Qadri J. Hamarsheh

Optimal Sizing of CMOS Operational Amplifier by an Improved Ant Colony Optimization Technique 19
Bachir Benhala

On the Use of Undersampled Signals for Power Amplifiers Linearization using Digital Predistortion 24
Serien Ahmed, Oualid Hammi

Design of a Low-Noise Amplifier for Ultra Low Power Wake-Up Receiver in 868 MHz 30
Oussama Chafai, Mohamed Wajih Nasri, Rim Barrak, Sarah Ouerghemmi, Ilef Ketata, Faouzi Derbel

Effects of Electrical Energy Storage Devices on Frequency Management in Various Typical Power System Operating Situations 36
Raghad Hameed Ahmed, Ahmed Said Nouri

Influence of the Load Variations on the PSS Performance During Steady State and Transient State 43
Wassan Adnan Hashim, Jawad Hamad Hameed, Nabil Derbel

Control of an Electrical System by Recurrent Neural Network RSOM Map 50
Nejib Khalfaoui, Mohamed Salah Salhi, Tahar Bahi

Micro-Grid Power System Monitoring Design 55
Mohamed A. J. Al-Ani, Nabil Derbel

Synchronverter as Control Strategy of Grid-Forming Inverter 61
Asma Ben Chida, Ghada Boukettaya, Rafik Cherni

Offgrid Portable Solar PV System for Emergency Conditions 67
Munzer S. Y. Ebaid

High-Performance Super Twisting Sliding Mode MPPT Control for Photovoltaic System Under Partial Shading Conditions 84
Nassir Deghfel, Abd Essalam Badoud

Review of Reliability and Economically Based on Wind Turbine and Photovoltaic with Different Energy Storage Systems 89
Atiyah A. Altayf, Hafedh Trabelsi

Solar Irradiance Forecasting using Gaussian Process Regression Model 99
Nesrine Omri, Jannet Jamii, Majdi Mansouri, Mohamed Faouzi Mimouni

Bagging and Voting Deep Learning Ensemble Methods for Binary Classifications of Solar Panel Cells Defects 104
H. Tella, M. Mohandes, A. Al-Shaikhi, B. Liu, S. Rehman, H. Nuha

Sliding Mode Control for Lower Limb Rehabilitation Exoskeleton Contacting with Floor 109
Mohammad A. Faraj, Boutheina Maalej, Nabil Derbel

Solving Inverse Kinematics for 3R Manipulator using Artificial Neural Networks 116
Muhammad Esmat, Mohammed Abdel-Nasser, Abdul-Wahid A. Saif

Robust LMI-Based State-Feedback Control of a Knee Exoskeleton Robotic System 121
Sahar Jenhani, Hassène Gritli

A Composite Robust Position Control Design for an Actuated Knee Rehabilitation Exoskeleton 129
Sahar Jenhani, Hassène Gritli

Lyapunov Exponents for Further Study of the Gait Complexity of the Passive Compass-Like Biped Walker 135
Essia Added, Hassène Gritli, Safya Belghith

A Bioinspired Adaptation-Based Algorithm for Swarm of UAVs in Multiple Threat Prone Environments 143
M. Muzakkir Quamar, Sami Elferik, Abdul-Wahid A. Saif

Rehabilitation Robot with a New Diagnostic and Control Protocol 151
Ismail Ben Abdallah, Yassine Bouteraa

An Artificial Neural Network Approach in Solving Inverse Kinematics of a 6 DOF KUKA Industrial Robot 157
Qadri Hamarsheh, Mohammed Baniyounis, Rolf Biesenbach, Mohammed Jernaz

KUKA Robot Language Parser for Product Adaptive Manufacturing 164
Robert Rosenstock, Tim Wrütz, Rolf Biesenbach

Mobile Robot Modelling and Design of Kinematic Controller for Trajectory Tracking 170
Nessrine Khlif, Nahla Khraief, Safya Belghith

Simulation of a 2-R Robot Model Based on SolidWorks Design and Matlab/Simulink Trajectory Verification 177
Mohammed Abdel-Nasser, Muhammad Esmat, Abdul-Wahid A. Saif

Determining the Dynamic Parameters of a Robot using the Method of Instrument Variables 184
Saada Fadwa, Chabir Karim, Abdelkrim Mohamed Naceur

Distributed Event-Triggered Adaptive Cooperative Circumnavigation Control of Networked Unmanned Aerial Vehicles 190
Jawhar Ghommam, Raouf Fareh, Ibrahim Al Naimi

IoT Based Control of Robotic Manipulator using Arbotix-M Microcontroller 197
Ahtisham Urooj, M. Muzakkir Quamar, Abdul-Wahid A. Saif

Multi-Parameter Sensing Based on the Stimulated Brillouin Scattering in Ring Core Fibers 203
Alaaeddine Rjeb, Amr M. Ragheb, Maged A. Esmail, Habib Fathallah, Saleh Alshebeili

Fabrication and Characterization of Ti/TiN- Based Resistance Temperature Detector 209
Walid Filali, Hadjira Haridi, Elyes Garoudja, Mohamed Boubaaya, Abdelkrim El Hadi Khediri, Mohamed Mekheldi, Laid Henni, Fouaz Lekoui, Rouabeh Hamza, Rachid Amrani, Slimane Oussalah

Investigation on NO_2 Sensing Behavior of WO_3 Nanograined Resistive Sensors..... 213
Ada Fort, Marco Mugnaini, Enza Panzardi, Valerio Vignoli

Soil-Based Sensor for Measurements of Static Magnetic Field 218
Carlo Trigona, Davide Di Maria, Eusebio Belfiore, Giuseppe Faranda, Anna Maria Gueli, Nunzio Salerno, Salvatore Baglio, Adi R. Bulsara

Synthesis of TPU/MWCNT Nanocomposite-Based Filament for Strain Sensors Application..... 223
Imen Ayedi, Rajarajan Ramalingame, Olfa Kanoun

A Calibration Methodology of Low-Cost Air Pollutant Sensor Calibration using Neural Networks 229
A. Souani, A. Hucher, V. Vigneron, H. Maaref

Artificial Intelligence for Securing SDIoT: Challenges and Countermeasures 236
Ameur Salem Zaidoun, Hajer Baccouch, Abderrahmen Guermazi, Zied Lachiri

Integration of Lightweights Blocks Ciphers as an Extension into Microprocessor for IoT Security 243
Ali Abdelli, Wajih El Hadj Youssef, Mohsen Machhout

Implementation Efficient Oil Pipelines Leak Detection and Localization System using RTTM 254
Abbas Rushdi Kubba, Hafedh Trabelsi

Flooding Attack: Implementation, Detection, and Prevention for UAV..... 263
Faten Al-Abdulwahhab, Uthman Baroudi

Transmission Tower Detection and Camera Re-Centering Embedded System Based on Image Processing..... 269
Achref Abed, Hafedh Trabelsi, Faouzi Derbel

Online PV Panel Characterisation for PV System Diagnostic..... 276
Fadoua Borchani, Souhir Sallem, M. Kammoun

Optimization of a Permanent Magnet Motor with Firefly Metaheuristic Algorithm..... 289
Emna Elyounsi, Ali Mansouri

Analysis Model and Numerical Investigation of Electromagnetic Tube Expansion with Field Concentrator 294
Ilhem Boutana, Mohamed Rachid Mekideche, Habiba Bali

Performance Comparison of Fuzzy Logic Control and PI Control for DC Microgrid 299
Ayman Masmali, Abdul-Wahid A. Saif, Mujahed M. Al-Dhaifallah

A Modified DBSCAN Clustering Algorithm for the Identification of PWA Systems..... 306
Lassoued Zeineb, Abderrahim Kamel

Fuzzy-Based Climb of an Ecological Montgolfier for Large Agricultural Lands' Supervision 312
Rahma Boucetta

A New Design of a Bionic Hand Controlled by EMG Signals: A Preliminary Study 318
Ismail Ben Abdallah, Yassine Bouteraa

Optimization of Microfluidic-Integrated Sensor for COVID-19 Application 323
Nuha Al Harbi, Maissa Belkhiria, Fraj Echouchene

Taguchi Optimization of Electrothermal Microfluidic Annular Biosensor for Rapid SARS-CoV-2 Detection 329
Ibrahim Ben Mariem, Sameh Kaziz, Fraj Echouchene

An Intelligent Cylindrical Reflector for Airborne Virus Detection 334
Ahmed Hadded, Mossaad Ben Ayed, Shaya A. Alshaya

ECG Data Forecasting Based on Linear Models Approach: A Comparative Study 339
G. Ben Othman, L. Sidhom, I. Chihi, E. N. Kamavuako, M. Trabelsi

CapDC: A New Capuchin Search Based Algorithm for Efficient Data Collection in Wireless Sensor Networks 345
Raj P. V. Pravija, Amel Al Ali, Ahmed M. Khedr

Optimized Classification System for MRIs with MOO Technique and SVM 351
Syrine Neffati, Mohsen Machhout

Selection of Robust Regional Computed Tomography (CT) Radiomics Features for COVID-19 for AI Based Classification 356
Mahbubunnabi Tamal, Mohamed Deriche

Enhanced CNN Security Based on Adversarial FGSM Attack Learning: Medical Image Classification 360
Lazhar Khriji, Seifeddine Messaoud, Soulef Bouaafia, Ahmed Chiheb Ammari, Mohsen Machhout

Automatic Diagnosis of Plant Leaf Diseases Based on Deep Learning Approach 366
Balkis Tej, Soulef Bouaafia, Mohamed Ali Hajjaji, Abdellatif Mtibaa

Machine Learning and Deep Learning in Chest X-Rays Images for COVID-19 Diagnosis: A Review 371
Hussein Ahmed Ali, Walid Hariri, Nadia Smaoui Zghal, Dalenda Ben Aissa

A Review of Alzheimer's Disease and Emerging Patient Support Systems 379
Thair A. Kadhim, Nadia Smaoui Zghal, Walid Hariri, Dalenda Ben Aissa

Enhanced U-Net Approach: Semantic Segmentation for Self-Driving Cars Applications 387
Wijden Bouzidi, Soulef Bouaafia, Mohamed Ali Hajjaji, Luis M. Bergasa

An Investigation for Cursive Context-Specific Printed Script Recognition Techniques 393
Humera Rafique, Tariq Javid

Threshold Impact for CNN Partitioning Algorithm in the Versatile Video Coding Standard 403
Bouthaina Abdallah, Fatma Belghith, Mohamed Ali Ben Ayed, Nouri Masmoudi

Statistical Analysis of Multiple Transform Selection in VVC Test Model (VTM) 408
Sonda Ben Jdidia, Fatma Belghith, Nouri Masmoudi

Modified PSNR Metric for Watermarked-Image Assessment 414
Taha Basheer Taha

An EMS Based on the FLC of a Variable Three-Phase Dump Load Composed of PV/Fuel Cell/Battery Systems 419
Ayat Yahia, Badoud Abd Essalam, Mekhilef Saad

FEA Based Investigation of Discoid Rotor Sizing Effect on the ClaW Pole TFPM Performances 425
Anis Njeh, Hafedh Trabelsi

3D FEA of the Performances of Magnetic Separator for Different Drum Topologies 429
Anis Njeh, Ayad Ahmed Nour El Islam, Hafedh Trabelsi, Wafa Krika, Houari Boudjella, Najdib Kadri

Comparative Analysis Between SQP and PSO Approaches with Components Tolerances Effect for Optimizing a One MW PV Substation 433
Rawia Chakroun, Ramzi Ben Ayed, Nabil Derbel

Experimental Validation of PV Power Prediction with ML Models for Improved Grid Integration 439
Lazher Mejdi, Faten Kardous, Khaled Grayaa

Optimizing Plant Process by Adding Soft Sensors 446
Nayef Salman Al-Dossary, Mohammed Aldahlan, Abdul-Wahid A. Saif

FDCN-ML: Forecasting Directional Changes in the NASDAQ Market using Machine Learning 456
Ahmed M Khedr, Pravija Raj P V, Magdi El Bannany, Youssef Mansour, Amer Bakhach, Hozayfa El Rifai

Arbitrary-Oriented Arabic Scene Text Annotation Based DeepAL and Scale-Aware Data Augmentation 463
Khalil Boukthir, Tarek M. Hamdani, Adel M. Alimi

Remaining Useful Life Prediction in Turbofan Engines: PCA and Machine Learing Approach 469
Saliha Boutora, Yacine Aribi, Pr. Razika Boushaki Zamoum, Hafid Menasria, Abdelkader Abdellaoui, Pr. Abdellah Kouzou

Turbofan Engine RUL Prediction using ICA and Machine Learning Algorithms 477
Yacine Aribi, Saliha Boutora, P. Razika Boushaki Zamoum, Hafid Menasria, Abdelkader Abdellaoui, P. Abdellah Kouzou

A Microcontroller-Based System for Lighting Control in an Office Building using IoT 485
Besher Alluwaymi, Azzedine Yahiaoui, Mohamed Deriche

New Dynamic Matrix Control for a Class of Switched System 491
Ali Thamallah, Anis Sakly, Faouzi M'Sahli

New Robust Stability Analysis for Switched Neutral Systems with State Time-Delays 497
Nidhal Khorchani, Rafika El Harabi, Wiem Jebri Jemai, Hassen Dahman

Adaptive Higher Order Finite-Time Sliding Mode Control for Master-Slave Manipulator with Fixed-Time Delays 503
Neila Mezghani Ben Romdhane, Mohamed Boukattaya, Tarak Damak

Optimal Control and Balancing of Double Inverted Pendulum using Linear Quadratic and Model Predictive Controller 509
Musab Alsheikh, Luay Elkhider, Abdul-Wahid A. Saif

Enlarging the Domain of Attraction in Nonlinear System with Input Saturation 514
Boudour Dabbaghi, Faiçal Hamidi, Houssem Jerbi, Mohamed Aoun

Further Result on Interval Estimation for Switched Linear Systems Based on Zonotopic Techniques 520
Leila Dadi, Thach Ngoc Dinh, Haifa Ethabet, Tarek Raissi, Mohamed Aoun

Parameters Optimization of Convolutional Neural Network to Synthesize 12-Lead ECG from a 3-Lead 526
Nizar Dhahri, Nesrine Majdoub, Taoufik Ladhari

Modeling and Characterization of a Hydroelectric Transducer for Energy Harvesting Applications 531
Carlo Trigona, Angelo Gresti, Adrian Pirosca Valeriu, Rosaria Galvagno, Sara Panebianco, Emanuele Di Miceli, Salvatore Baglio

Adaptive Computation Offloading for Heterogeneous IoT Applications: An Experimental Study 537
Othman Al Aidaros, Zied Bouida, Mohamed Ibnkahla

Read and Write Circuit for Memristive Neural Networks 543
Mouna Elhamdaoui, Khaoula Mbarek, Faten Ouaja Rziga, Kamel Besbes

Modeling and Optimisation of a Hybrid Energy Harvesting System for IoT Nodes Through PSO-MPPT 547
Sirine Rabah, Aida Zaier, Hassen Dahman

Fast Supercapacitor Charging for Electromagnetic Converter Systems by Self Powered Boost Circuit 553
Kholoud Hamza, Ghada Bouattour, Sebastian Bader, Ahmed Fakhfakh, Olfa Kanoun

Analysis and Design of a Compact SSRR for Passive RFID Tag Antenna 559
Mahdi Abdelkarim, Mohamed Yassine Boughrara, Ali Gharsallah

Design of Novel Reciprocal Inverse Graded Index Fiber (R-IGIF) for OAM-SDM Communication Systems 564
Alaaeddine Rjeb, Amr M. Ragheb, Maged A. Esmail, Habib Fathallah, Mohsen Machhout, Saleh Alshebeili

Separation of Multi-Speaker Speech from an Underdetermined Mixture of Sources 569
Khaoula Mraihi, Mohamed Anouar Ben Messaoud

PWM Based Software Defined Radio Modeling 574
Ahmed Sakr, Aziza I. Hussein, Ghazal A. Fahmy, Mahmoud A. Abdelghany

Cooperative PSO Heuristic for System Identification Beyond MSE Boundary in Ad-Hoc Network 580
Ali M. Almohammedi, Mohamed Deriche

An Effective Random Forest Based Long-Term Wind Power Forecasting Technique 586
Jannet Jamii, Mohamed Trabelsi, Majdi Mansouri, Mohamed Faouzi Mimouni

HESG Based WECS Overview, Modeling, and Fractional Order Control 591
Amina Mseddi, Omar Naifar, Ahmed Abid

Insertion of the WindPACT Turbine Based on a HESG in a Medium Voltage Network 597
Amina Mseddi, Omar Naifar, Ahmed Abid

Active and Reactive Power Control of the PMSG Based on Wind Energy Conversion System using Nonlinear Backstepping Control 604
Mahgoun Mohemmed Seddik, Badoud Abd Essalam

Wind Energy Conversion System using PMSG Controlled by Vector Control and Nonlinear Backstepping Strategies 610
Mahgoun Mohemmed Seddik, Badoud Abd Essalam

An Improvement Control Strategy of Stand-Alone PV, Wind, and Battery System 616
Jihed Hmad, Imen Jarraya, Rabeb Abid, Hafedh Trabelsi, Azeddine Houari, Nassim Rizoug

Comparative Study Between Classical and Fuzzy Logic DTC Strategies Aimed to an IPMSM Drives 626
Salma Charmi, Bassem El Badsi, Abderrazak Yangui

Genetic Algorithm Based Multi-Objective Optimization of SMPM 633
Maria Amaidi, Ali Mansouri

Electric Vehicle Driven by PMSM 637
Mabrouka Romdhane, Ali Mansouri

Fuzzy Adaptive Backstepping for the Control of the Electrical Drive Wheels' Speed 642
Medjdoub Khessam, Abdeldejbar Hazzab, Anis Njeh, Hafedh Trabelsi, Miloud Rezkallah, Ambrish Chandra

Voltage Balancing using Particle Swarm Optimization and Support Vector Machine 648
Jasim Ghaeb, Ibrahim Al-Naimi, Malek Alkayyali

A Super-Twisting Algorithm Based the Sliding Mode Control Applied on the Speed Permanent Magnet Synchronous Machine 654
Karboua Djaloul, Toual Belgacem, Benaissa Mohamed Lamine

Closed-Loop Identification Practice of Two-Shaft Gas Turbine Variables with Reliable Linear Control Approach 661
Nadji Hadroug, Tarek Idris Bisker, Abdellah Kouzou, Abdelhamid Iratni, Ahmed Hafaifa, Ilhami Colak

Distributed Event-Triggered Scalable Formation Control for Multiple Autonomous Vehicles 669
Jawhar Ghommam, Mohammed H. Rahman, Faisal Mnif

FDI Based Extended Kalman Filter for Multi Robot System 675
A. Jouili, B. Boussaid, A. Zouinkhi, M. N. Abdelkrim

Adaptive Nonlinear Backstepping Control for Trajectory Follower Slung Load of Quadrotor 681
Ahmed Alshakhs, Khalid Bin Gaufan, Sami El Ferik

Optimal Altitude Range for Image Collection Drone from Agricultural Areas with Image Resolution and Power Consumption Constraints 689
Ahmed Abubakar, Mogahid Farah, Musab Alsheikh, Abdul-Wahid A. Saif

Lateral and Longitudinal Tire Force Prediction using Soft Computing 694
F. Abdessemed

Fractional Order and Smith Predictor Structure – Performance Analysis for Pressure Control Process 700
Mujahed Al-Dhaifallah

Fractional Order Based Controllers for Lower Limb Exoskeleton in Contact Environments 705
Mohammad A. Faraj, Boutheina Maalej, Nabil Derbel

A New Mutimodel Approach for Modelling of Fractional Order Interval Transfer Functions 711
Samia Talmoudi, Moufida Lahmari Ksouri

Optimization-Based Design of Fractional PID Controllers for MISO Systems 717
Noura Ben Moussa, Manel Chetoui, Messaoud Amairi

Gravity Compensation and Fractional Control of Lower Limb Exoskeleton 723
Intissar Zaway, Rim Jallouli-Khlif, Boutheina Maalej, Hanène Medhaffar, Nabil Derbel

Towards an Integrated Framework for Fugitive Methane Source Localization and Monitoring in a Wireless Sensor Network 728
Amira Al Jawhari, Yasmine Souissi, Jawhar Ghommam, Yassine Jamoussi, Faisal Mnif

Structural Holding Monitoring and Microclimate Measurements in Museum Showcases..... 734
Carlo Trigona, Barbara Mancuso, Valter Pinto, Muhammad Mujtaba, Serena Rapisarda, Anna M. Gueli

A Dual-Band Low-IF Hartley Image-Reject Receiver for Multi-Standard Wireless Applications and IoT Domain 739
Fethi Farhat, Hassen Dahman

E-Textile Technology: From Materials to Applications and Wireless Distance Transfer 744
Yosra Ben Fadhel, Ghada Bouattour, Dhouha Bouchaala, Nabil Derbel, Olfa Kanoun

Energy Efficient Wake-Up Receiver MAC Protocol in OMNeT++ for Indoor Wireless Sensor Network Communication 750
Mohamed Khalil Baazaoui, Ilef Ketata, Ahmed Fakhfakh, Faouzi Derbel

Side Peak Cancellation by Adaptive Non Coherent Acquisition for the Galileo E1 Signal 756
Siham Dehouche, Mhamed Hammadouche

Robust Calibration of Magnetometer with Alternating Direction Method of Multipliers 763
Guanglie Ouyang, Karim Abed-Meraim

Direction of Arrival Tracking using Adaptive Robust Subspace Decomposition and Kalman Filter 771
Zineb Bekhtaoui, Abdelkrim Meche, Karim Abed-Meraim, Mohamed Dahmani

Outcome Based Performance Evaluation Approach using Rubric Based Capstone Projects Assessment 777
Khalid Ammar, Rao Naveed Bin Rais

Efficient Recursive Total Least Mean Fourth Algorithm..... 784
Kabiru N. Aliyu, Mohamed Hafez Mohamed, Abdulmajid Lawal, Ali Muqaibel, Muhammad Moinuddin, Azzedine Zerguine

Energy Management Control of Electrical Vehicle PV Charging Station 788
Nahla Ben Halima, Naila Ben Halima, Abdelmajid Oualha

Performance of a Hybrid Solar PV-Grid-Powered Domestic Air Conditioner 793
Saad Imène, Maalej Samah, Zaghdoudi Mohamed Chaker

Energy Management in Microgrids with Renewable Energy Sources and Energy Storage System..... 801
Ansam B. El-Fawair, Kasim M. Al-Aubidy, Mustafa A. Al-Khawaldeh

Fuel Consumption Optimization for Parallel Hybrid Vehicle Based on Divided Rectangle Algorithm 807
Naila Ben Halima, Nahla Ben Halima, Naourez Ben Hadj, Rafik Neji

Determining the SoH of Lithium-Ion Batteries Based on the Differential Impedance Analysis 812
Hamza Boughanmi, Ahmed Yahia Kallel, Amin Fischer, Hafedh Trabelsi, Olfa Kanoun

Simple and Robust Control Algorithm for Three Phases Hybrid Excitation Synchronous Motor Drive 819
Hadj Abdallah Saber, Tounsi Souhir

Robust Sensor Faults Observer Design for Continuous-Time Switched Systems using Descriptor Approach 825
Mohamed Elouni, Habib Hamdi, Bouali Rabaoui, Naceur Benhadj Braiek, Mickael Rodrigues

Stabilization Control for LPV Neutral Time Delay Descriptor Systems 832
Rabeb Benjemaa, Aicha Elhsoumi, Mohamed Naceur Abdelkrim

Functional Interval Observers-Based Fault Detection for Multivariable Systems 837
Rihab Akremi, Rihab Lamouchi, Messaoud Amairi

Optimal Tracking Control for 3D Overhead Crane with Varying Time Delay and Windy Disturbance 844
Nezar M. Alyazidi

Zonotopic Fault Estimation for Linear Parameter Varying Systems: Application to Wind Turbine 850
Rihab Lamouchi, Messaoud Amairi, Tarek Raïssi, Mohamed Aoun

On the Effect of Optical Power on Quantum Dot HEMT Transistor 856
Sami Ghedira, Abdelaali Fargi, Adel Kalboussi

Design and Concept of a Low-Pass Filter for the UHF Band 862
Hamza Ben Krid, Ramón De La Rosa Steinz, Zied Houaneb, Hassen Zairi

Modeling of p+/n-Well and n+/p-Well Diodes Based on 1µm CMOS Technology using GWO Algorithm 867
Mohammed Mekheldi, Walid Filali, Elyes Garoudja, Slimane Oussalah

Design of a 5-Gauss Line System to Warn Persons with Medical Implants from Critical EM Field 871
Yosra Ben Fadhel, Sana Ktata, Kouala Yefrni, Salem Rahmani, Kamal Al-Haddad

Gain Analysis of Prototyped Wilson Current Mirror using Double-Gate MOSFET 877
Mbalenhle Mngomezulu, Viranjay M. Srivastava

The Effect of Sensor Array Design on Acoustic Imaging for Enhancing HFCWO Therapy 887
Chang Sheng Lee, Minghui Li, Yaolong Lou, Ravinder Dahiya

Hybrid Wheelchair Control Method with EEG Signal and Facial Expression 893
Lassaad Zaway, Nader Ben Amor, Mohamed Jallouli, Larbi Chrifi-Alaoui, Laurent Delahoche

Controlling Wheelchair using EEG Signal and Machine Learning 898
M. Alseddiqi, M. Almahmood, U. Baroudi, A. Alzaydi

Improved Particle Swarm Optimization Algorithm for EIT Image Reconstruction 906
Oumayma Kahouli, Mariem Hafsa, Hiba Hellara, Imed Eddine Bennour, Najoua Essoukri Ben Amara, Olfa Kanoun

Left Ventricle Wall Motion Abnormalities Detection in Cardiac MRI 912
Narjes Benameur, Rania Awadi, Ramzi Mahmoudi, Mohamed Deriche, Mohamed Al Betar

A Diagnostic System for Classifying and Segmenting Breast Cancer Based on Ultrasound Images 919
Haifa Ghabrim, Chaker Essid, Hedi Sakli

Heartbeat Classification of Arrhythmia using Hybrid Features Extraction Techniques 925
Fatin A. Elhaj, Mohamed Deriche, Nabia Khalid

ECG Images Automated Diagnosis Based on Machine Learning Algorithms 934
Marwen Sakli, Nizar Sakli, Hedi Sakli

Efficient Thoracic Aortic Aneurysm Detection Method to Prevent Potential Acute Aortic Dissection..... 940
Abdelbaki Souid, Chaker Essid, Mohamed Hamroun, Hedi Sakli

3D Geometry Design of the Human Thorax and Forward Calculation for Electrical Impedance Tomography..... 945
Youssef Alwaz, Oumaima Bader, Najoua Essoukri Ben Amara, Olfa Kanoun

Design of Super Twisting MPPT Controller using DC-DC ZETA Converter 951
Badreddine Kanouni, Abd Essalam Badoud, Saad Mekhilef

Seven-Level Cascade Multilevel Inverter Based Minimum Switches for Photovoltaic Applications..... 957
Ali Abedaljabar Al-Samawi, Hafedh Trabelsi

High Performance Dual Control Feed Forward Based Fuzzy Logic Technique & Finite Set Control Model Predictive Control for a Grid-Connected PV System..... 967
Attik Nadjah, Badoud Abd Essalam, Merahi Farid, Rahmani Lazhar

Multi-Objective FSC-MPC for Single Phase Three Level Grid Connected F-Type Inverter PEMFC System 973
Badreddine Kanouni, Abd Essalam Badoud, Saad Mekhilef

Prototype of Automated Blood Specimens System 979
Ibrahim A. Aljamaan, Amjad M. Amtealeq, Ayman M. Aljumaia, Mohammed A. Hashim, Mohammed Y. Bin Alshaikh

Student Attendance System using iTag's Beacon Detection..... 985
Husam Alzaq-Osmanoglu

Studying the Economic Cost of Integrating Statistical Process Control and Automatic Process Control: A Review and Future Work 990
Abdul-Wahid A. Saif, Salih Duffuaa

Integrated Production, Maintenance, and Quality Strategy for Production Systems Subject to Several Assignable Causes of Process Variation 997
A. Abubakar, Zied Hajej, Aime C. Nyoungue

Nonlinear Control Algorithms Applications for Quadrotor..... 1003
Bourouis Belquis Imane, Boushaki Razika, Larit Mohamed Islem, Zerroug Khalil, Aribi Yacine, Kouzou Abdellah

Guardian Map Approach for PID and State Feedback Controllers Synthesis 1014
Mohamed Hechmi Bouazizi

Modeling and State Estimation of Discrete Event Systems using Hybrid Petri Nets..... 1021
Khouloud Soltani, Atef Khedher, Adel Khedher

Convex Optimization in Model Predictive Control Based on Hammerstein Model..... 1027
Chagra Wassila, Chouaibi Dhouha

Integrated Prevention Mechanism Based on High Level Petri Nets..... 1033
Khamsa Farah, Karim Chabir, Mohamed Naceur Abdelkrim

A Smart HMI Interface for an H_2/O_2 Anti-COVID Machine 1039
J. Kaouthar. Kammoun, A. Najjar, Kais Jammoussi, B. Gassara

Design and Implementation of Smart Pill Box for Healthcare Applications 1046
Houda Daoud, Maissa Daoud, Nader Jardak, Chayma Albouzidi

Connected Parking for Smart Cities: Prototype and Android Application 1051
Maissa Daoud, Houda Daoud, Najeh Harrabi, Hatem Zouari

Energy Management and Load Forecasting in Smart Grid 1057
Monia Bartouli, Abdelhamid Helali, Fredj Hassen

The Development of a Smart Water Quality Monitoring System 1063
Marya Al Nadabi, Ali Al Humairi, Khadija Al Balushi, Yasmine Souissi

Author Index