

# **2023 IEEE International Conference on Recent Advances in Systems Science and Engineering (RASSE 2023)**

**Kerala, India  
8-11 November 2023**



**IEEE Catalog Number: CFP23AQ3-POD  
ISBN: 979-8-3503-4168-3**

**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:	CFP23AQ3-POD
ISBN (Print-On-Demand):	979-8-3503-4168-3
ISBN (Online):	979-8-3503-4167-6

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

Repetitive Controller Design for Coriolis Mass Flow Meter Using B-Spline Filters.....	1
<i>Rajaprasanna R, Balasubramanian G, Ghousiya Begam K</i>	
A Model Based System Architecture Methodology Leveraging the ARCADIA Method.....	9
<i>Eric B. Dano, Stephane Lacrampe</i>	
A Novel Substrate Cylindrical Cavity 4×4 Fractal Inspired MIMO Antenna for 5G - N258 Satellite Communication .....	17
<i>Arun Raj, Durbadal Mandal</i>	
Sum Rate Maximization in Cooperative Non-Orthogonal Multiple Access Based 5G Wireless Networks .....	24
<i>Aswathi V, Rahul Manohar O, Priyesh Ranjan</i>	
Smart Contract Based Carpooling Application for Secure and Efficient Ride Sharing.....	30
<i>Ramani Bai V, Pranav Sudhir, Rashmi Joshi, Vighnesh Nair, Vishnu Anilkumar</i>	
TBSA: Ensuring Secure Data Communication in Wireless Sensor Network.....	37
<i>Joby P P, Praseetha V M, Akhil Sekharan</i>	
Improvisation in SHA Algorithm .....	42
<i>Sangheethaa S, Arun Korath, Ranjana C</i>	
Autonomous Water Quality Monitoring Surface Vehicle .....	46
<i>Manushri Saljith Nambiar, Arjun Ramakrishnan, Anirudh Lakshman, Abhiram P V, Girish P</i>	
Implementation and Analysis of Single Digit BCD Multipliers Without Generating Partial Products .....	51
<i>Darsana S, Deepa Susan Jacob, Laghima P M, Sarah Jacob, Deepa J, Ramesh P</i>	
An Efficient Smart-IoT-Aided Waste Management System with Optimal Shortest Path Routing Using Mud Ring Algorithm.....	56
<i>V V Satyanarayana Kona, M Subramoniam, Binson V A</i>	
Trans-Domain Sea-Air Integrated Robot.....	63
<i>Philip C Jacob, Anish Thomas</i>	
Application of Concrete Sensors in Different Structural Members.....	68
<i>Sneha M Varghese, Sajeeb R, Anitha Joseph, Paul Chacko, Gokul Gopan</i>	
Automatic Solar Panel Cleaner.....	74
<i>Gayathry Menon, Anjana N Sathyan, John J Tharayil, Aswin Ramesh, Jayan A. R.</i>	
RF Systems for Aerospace – Evolving Methods, Techniques and Applications .....	79
<i>Sreelal S, Bibin Varghese, Midhunkrishna P R, Reshma S, Indu Gopan, Joji John Varghese</i>	
A Miniaturised Low-Cost Telemetry System for Small Satellite Launch Vehicles .....	84
<i>Sajin S, Priya P, Divya U S, Haresh Kumar Singh, Vidya S B, Anand P M, Pradeep Kumar P., Finitha K C, Sreelal S, Sreekumar S, Abdul Samad A K, Vinod P.</i>	
Fake Profile Detection in Online Social Networks Using Machine Learning Models .....	90
<i>Jyothis Joseph, Vineetha S</i>	

Design of a Current Feedback Instrumentation Amplifier for Resistive Sensor Readout Interface .....	95
<i>Anupama A, Deepu Roy, Padmakumar K</i>	
Resource Allocation in V2V Sidelink Communication .....	100
<i>Sherry Varghese George, Abbas Salim, Joshua G. Reji, Geethu B., Mekha A. S., Jayakumari J.</i>	
A Systematic Review on Detection and Classification of Melanoma .....	107
<i>Sreelakshmi Jayasankar, T. Brindha</i>	
Restaurant Order Management with an Automated Serving Bot.....	115
<i>Swathi M S, Afrin A S, Neha K Binesh, Salmanul Faris K P</i>	
GPU Acceleration of Multi-Vehicle Detection and Classification for Unmanned Aerial Vehicle Surveillance Application Using YOLOv3 .....	121
<i>Devshree Kumar, Atharva Khand, P. V. Satyanarayana Murthy</i>	
Estimation of Learners' Levels of Adaptability in Online Education Using Imbalanced Dataset .....	130
<i>Manjima Sree, Jobel John James, Alphy Shaji, Ambily Merlin Kuruvilla</i>	
Deepfake Detection Using XceptionNet .....	137
<i>Ashok V, Preetha Theresa Joy</i>	
A High Secure Video Steganography Based on Effective Quasigroup-Based Encryption and Shearlet Transform .....	143
<i>Meenu Suresh, Tonny Binoy</i>	
Automation of Rubber Coagulating Process Along with Dispensing and Stacking System.....	149
<i>Daru Anna Thomas, Ancy Sara Varghese, Abin Shaji, Adhin M, B Surya Kumar, Maheswari V Nair</i>	
Data Driven Energy Management of Residential PV-Battery System Using Q-Learning.....	155
<i>Krishna Baberwal, Anshul Kumar Yadav, Vikash Kumar Saini, Ravita Lamba, Rajesh Kumar</i>	
Project Risk Mitigation in Autonomous Vehicles Systems: The Tesla Way .....	161
<i>Milind Kanbur, Om Prakash C, Prasad Kulkarni</i>	
Classification of Skin Lesions Using Deep Learning Models with Transfer Learning Techniques.....	170
<i>Paparao Mekala, Surendiran B, G. Vishnu, G. Jaideep Sai, P. Subash</i>	
A Data Flow-Based Approach for Classification and Risk Estimation of Android Apps .....	179
<i>Md. Meraj Uddin, Roopak Surendran, Gokul G. R., Tony Thomas</i>	
DEM Generation from Mono-Multispectral Images Via Uncalibrated Epipolar Rectification and 3D Registration .....	184
<i>Ashutosh Gupta, Hemant K. Lalwani, Subhajit Paul, Debajyoti Dhar</i>	
Cyber Threat Analysis and Design of IMC-PID Conventional Controller of PWM DC-DC Buck Converter (Part A) .....	192
<i>Anilkumar Badavath, Vivek Kumar, Yogesh V. Hote, Md Masood Raza</i>	
Fractional Order Control of Three Level Dual Active Bridge Converter for EV Applications .....	198
<i>Ashna Joseph, Latha P G</i>	
Dynamic Positioning of a Ship Using Disturbance Observer Based Sliding Mode Control .....	205
<i>Nikhil Srivastava, Jagannath Samantaray, Sohom Chakrabarty</i>	

Experimental Determination of Nanoparticle and Surfactant Concentration in Silica Nanofluid for Transformer Insulation .....	211
<i>R. Balamurugan, S. Raja, Ram Jethmalani C H, G. Koperundeivi</i>	
A Potential Landslide Early Warning System Based on Threshold Velocity of 1 Mm/min.....	216
<i>Deepak Kumar, Ajit K. Mahapatro, Sushil Kumar Singh</i>	
Modeling, Simulation, and Optimization of a Gravitational Water Vortex Power Plant for Enhanced Power Generation .....	222
<i>Vinayakumar B, N Mahendran, Binson V. A, Harinarayanan Nampoothiri M. G, Jyothi Krishnan M, Rizwana Akbar</i>	
On Impact of Semantically Similar Apps in Android Malware Datasets .....	226
<i>Roopak Surendran, Md. Meraj Uddin</i>	
Joint Channel Estimation and Signal Detection in MIMO-NOMA Wireless Systems Using Deep Learning .....	232
<i>Beena A. O, JESTEENA SURENDRAN</i>	
Predictive Modeling of Residential Energy Usage with Deep Learning and IoT Devices .....	238
<i>Rovin John Regi, Karthik Prakash T, Joseph Joseph, Polly Thomas</i>	
A Multi-Objective Control Strategy for Power Quality Improvement with Enhanced LVRT Operation of a Grid-Interfaced Dual Voltage Source Inverter .....	244
<i>Nimitha Muraleedharan, Mahesh K. Mishra</i>	
Comparative Study of Machine Learning Techniques for Inverse Kinematics in a 5-DOF Manipulator .....	252
<i>Jittu George Eapen, Chinn Mohanan, Harinarayanan Nampoothiri M G</i>	
Guardian Alert: A Deep Learning Approach for Driver Drowsiness Detection and Force Sensing Integration .....	256
<i>Jitty Tresa Thomas, Joseph Mathew, Melwin George, Meril Rachel Saji, Renju Rachel Varghese</i>	
Security Risk Assessment of Metaverse Based Healthcare Systems Based on Common Vulnerabilities and Exposures (CVE).....	263
<i>Ravi Prakash, Gayathri R. Nayar, Tony Thomas</i>	
Pioneering Efficient Blockchain in IoT: A Review of Tailored Protocols for Modern Devices .....	273
<i>Tibin Thomas, Jubilant J Kizhakethottam, Neethan Elizabeth Abraham</i>	
Flexible Low Noise Amplifier for IoT Applications in Biomedical Devices .....	278
<i>Athul Krishnan, Dayarnab Baidya, Mitradip Bhattacharjee</i>	
A Study on Formal Verification of Smart Contracts in Distributed Ledger Technology .....	284
<i>Gokulnath G, Jubilant J Kizhakkethottam</i>	
A Meta Heuristic Algorithm Based LQR Controller for an Inverted Pendulum Stabilization.....	293
<i>Neeraj P C, Sanjay Joseph Chacko, Rajesh Joseph Abraham</i>	
Learning Based Adaptation of Proportional Derivative Controller for a Novel Rotary Slosh Dynamics Model .....	298
<i>Ashish Kumar Shakya, Gopinatha Pillai, Sohom Chakrabarty</i>	

Detection of Early Lung Cancer Cases in Patients with COPD Using eNose Technology: A Promising Non-Invasive Approach .....	306
<i>Binson V A, Sania Thomas, Prinu Chacko Philip, Anish Thomas, Pratap Pillai, Nithin John P</i>	
A Collision Response Model of an Ackermann Vehicle with Combined Longitudinal and Lateral Velocity.....	310
<i>Samsaptak Ghosh, M. Felix Orlando, Sohom Chakrabarty</i>	
Exploring Educators' Acceptance on Education 5.0 and Their Anxiety Towards Its Implementation: A Research Inquiry.....	318
<i>Chithra Vimal, Elgin Alexander</i>	
Comparative Analysis of ARIMA and GARCH Models for Forecasting Spot Gold Prices and Their Volatility: A Time Series Study .....	323
<i>Ardra Mani, Jose Joy Thoppan</i>	
IoT Systems Development Using Upcycled Mobile Phones: A Survey .....	328
<i>Challa Sai Reshwanth, Saivinay Goriparthi, Chandra Shekar R K, Lucy J. Gudino, Neena Goveas, Shubhangi Gawali</i>	
The Potential of Quantum Techniques for Stock Price Prediction .....	335
<i>Naman Srivastava, Gaurang Belekar, Neel Shahakar, Aswath Babu H.</i>	
A Survey on the Impact of Blockchain in Effective Organ Transplantation.....	342
<i>Liz George, Jubilant J Kizhakkethottam</i>	
An Economical Method for Modeling, Fabrication, Testing, and Characterization of a Bio-Phantom for Pulmonary Edema.....	348
<i>Irfana P P, Resmy S Anand, Anup Aprem, Vishal V P, Shaj Upendran, S. Harikrisnan</i>	
Enhancing Children's Learning Experience: Interactive and Personalized Video Learning with AI Technology .....	356
<i>Linu Anil Teresa, Navya Mariam Sunil, Sujit Renny Andrews, Thomas T Thengumpallil, Sania Thomas, Binson V A</i>	
FPGA Implementation of Sphere Decoding in MIMO Systems: Challenges Solutions and Design Issues .....	361
<i>Girija M G, Sudha T, Riboy Cherian</i>	
Networked Hybrid AC-DC Microgrids: Leveraging Fog Computing and Linear Solver for Efficient Energy Management.....	369
<i>Vikas Ranveer Singh Mahala, Anshul Yadav, D. Saxena, Rajesh Kumar</i>	
Analysis of Sentiments in Low Resource Languages: Challenges and Solutions .....	378
<i>Girija V R, Sudha T, Riboy Cherian</i>	
A Cluster Based Relay Assisted Communication for Prioritized Mobile End-Users .....	384
<i>Ashok K, Sudha T, B Rajalakshmi, Rachana P, Monika Gupta, Santhosh Krishna B V</i>	
Efficiency and Speed Trade-Offs in 8-Bit CMOS Adders at 180nm: An In-Depth Examination.....	389
<i>Ajith Ravindran, Abraham George, Anish M George, Deepthi Cherian, Femi Elsa Thomas, Sarath Kumar</i>	
RF Energy Harvesting Rectenna for Wearable Applications.....	399
<i>Riboy Cherian, Sudha T, Lakshmi Anil, Bijo Babu Cherian</i>	

Steady State Analysis of a UOP SBS Fluid Catalytic Cracking Unit in Aspen HYSYS .....	406
<i>Anish Thomas, Binson V A, Sania Thomas, Annie George, Anu George, Sony George</i>	
A Technical Assessment of SIR, SIR-V and SEIR Epidemic Models .....	411
<i>Jacob P Cherian, Jubilant J Kizhakkethottam</i>	
Precision Diagnostic Algorithm for Multisubtype Arrhythmia Classification.....	418
<i>S R Deepa, M Subramoniam, Binson V A, S. Poornapushpakala, S. Barani</i>	
A Systematic Review of Noise Types, Denoising Methods, and Evaluation Metrics in Images .....	422
<i>Preena Prasad, J Anitha, Divapriya Anil</i>	
Butterfly Classification Using CNN.....	431
<i>Ramesh Naidu Balaka, Lalithabhavani Konkyana, Ch. Chandra Sekhar</i>	
Paradigm Shift from Monolithic to Microservices.....	436
<i>Divarshana Saxena, Biswajit Bhowmik</i>	
Charge Transport Characteristics in Nitrogen Doped Carbon Quantum Dots Memristor .....	443
<i>Anju Kumari R, Yashwanth H. J.</i>	
Failure Analysis of Electromechanical Indicating Type Meters in an Industry by Using Fishbone and Pareto Models.....	448
<i>Ananda M H, Burri Ankaiah, Sujo Oommen, N Doddabasappa, Anil Kumar D B, Arun S Mali</i>	
Grey Wolf Optimization for Maximum Power Point Tracking with Incremental Conductance Algorithm .....	452
<i>Rajeswari Biswal, Sarat Chandra Swain, Ritesh Dash, Dayananda Reddy B</i>	
Synergistic Energy Utilization for Intelligent EV Charging Stations Via Hybrid Sources .....	457
<i>Sudhakar Rao P, Ritesh Dash, Ramakanta Jena, Darshan I A</i>	

**Author Index**