

2024 IEEE 30th International Symposium for Design and Technology in Electronic Packaging (SIITME 2024)

**Sibiu, Romania
16-18 October 2024**



**IEEE Catalog Number: CFP2407I-POD
ISBN: 979-8-3315-3952-8**

**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:	CFP2407I-POD
ISBN (Print-On-Demand):	979-8-3315-3952-8
ISBN (Online):	979-8-3315-3951-1
ISSN:	2641-287X

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

CURRAN ASSOCIATES INC.
proceedings
.com

Contents

#	Paper Title	Authors	Page
1	<i>Evaluating the Knowledge in Test Engineering Education using a Solar-powered Remote-controlled Flying Probe-Inspired In-Circuit Tester</i>	Sorin Liviu Jurj, Raul Rotar, Ioana Brîncovan, Flavius Opritoiu, Mircea Vladutiu	1
2	<i>Comparing large language model artificial intelligence tools in aid of electrical engineering</i>	Zoltán Tafferner, Attila Géczy	9
3	<i>The Intelligent Cover for Comfort and Diagnosis</i>	Mihaela Hnatiuc, Georgiana Popa	15
4	<i>A Reference Architecture for Deployment Strategies of Large Language Model Applications in an Industrial Environment</i>	Felix Mahr, Giulia Angeli, Till Sindel, Konstantin Schmidt, Jörg Franke	19
5	<i>Smart Solutions for Sustainable Urban and Food System Development</i>	Andrei Danila, Cristina Balaceanu, Robert Streche, Filip Osiac, Oana Orza, George Suciu	28
6	<i>AI Tools introduced in Software Development. Analysis of Code quality, Security and Productivity Implications</i>	Ana-Maria Dinca, Sabina-Daniela Axinte, Gabriela Tod-Raileanu, Ioan C. Bacivarov	32
7	<i>Optimizations of the Packaging of Li-Ion Battery Packs for Increasing Preconditioning Efficiency</i>	Rajmond Jano, Adelina Ilies, Alexandra Fodor	40
8	<i>IoT Devices for Monitoring and Analysing Air Quality in Urban Environments</i>	Rajmond Jano, Adelina Ilies, Elena-Mirela Stetco, Cosmina Corches	45
9	<i>Advancing Forest Conservation: IoT Devices for Monitoring the Wellbeing of Ecosystems</i>	Rajmond Jano, Adelina Ilies, Elena-Mirela Stetco	50
10	<i>Development of Control Strategies for an Industrial Robot to Increase Energy Efficiency</i>	Marius-Alexandru Dobrea, Mihaela Vasluiuanu, Giorgian Neculoiu, Gabriela-Valentina Olteanu, Mihaela-Gabriela Boicu, Eduard Varlan	55
11	<i>TIE M CAD Design Challenge</i>	Alexandru Falk, Marius Demian, Philip Coanda, Alina Rodica Spânu	60
12	<i>TIE T+- Thermal Management Student Contest</i>	Alexandru Mihal, Cristina Mihaela Drăgan, Marcel Manofu	72
13	<i>NLP-Based Solutions for Call Center Optimization</i>	Svetlana Segarceanu, Romulus Cheveresan, Gabriel Stoica, Marian Ceaparu, Theodor Pintilie, Maria Niculae, Inge Gavăt, George Suciu, Andrei Dănilă	77
14	<i>Resistive and Capacitive Sensors Driver for Irrigation Applications</i>	Alexandru-Andrei Alexa, Raul Fizesan	81
15	<i>TIE-M Plus: Alignment of Higher Education with Labor Market Demands</i>	Denisa Alexandra Chiuariu, Mihai Octavian Babaliga, Viorel Paleu	87
16	<i>EMI numerical simulations and measurements of spread spectrum frequency modulation by an automotive boost LED driver</i>	Lazăr Frate (cas.Kast), Alexandru Avram, Marius Purcar	91
17	<i>Signal Integrity Analysis and Channel Reach Extension for a PCIe 3.0 Digital Interface using CST Studio and Altium Designer</i>	Catalin Oprita, Ionut Ciprian Voiculescu, Raluca-Cristina Niculesc, Viman Liviu	96
18	<i>Small-Scale V2V-VLC for Enhanced Road Traffic Safety</i>	Elie Hajj Moussa, Alina-Elena Marcu, Rima Abdallah Chehade, Gilles Ballouz, Bogdan Ionescu	101
19	<i>SIMD Extensions – A Historical Perspective</i>	Diana Vuță-Popescu, Ionuț-Cătălin Antofi, Cătălin-Bogdan Ciobanu, Csaba Zoltan Kertesz	108
20	<i>Thermoelectric Behavior Simulation in Electronic Systems</i>	Alin Grama, Alexandra Fodor, Ana Cristina Davidas, Elena-Mirela Stetco	116

21	<i>The conducted emission attenuations produced by the ON-GRID photovoltaic systems loaded with residential consumers</i>	Dan Penciu, Marius Purcar, Sergiu Andreica, Calin Munteanu	120
22	<i>Integrating photovoltaic systems into HVAC control using fuzzy algorithms for optimizing thermal comfort</i>	Mihaela-Gabriela Boicu, Marius-Alexandru Dobrea, Mihaela Vasluiuanu, Gabriela-Valentina Olteanu, Georgian Neculoiu	124
23	<i>Comparative Workbench Study of MTBF for PoL Converters with discrete Transistors vs. integrated PoL</i>	Dan Butnicu, Daniela Ionescu, Ingrid-Mihaela Tamas	128
24	<i>Comparative Study of Artificial Intelligence and Machine Learning Algorithms on Synthetic Lithium-ion Cell Data</i>	Eliza Olariu, Adelina Ilies, Horia Hedesiu, Gabriel Chindris	132
25	<i>Implementing of a New Software-Defined Radio Receiver Used for DSSS-CDMA Data Signals</i>	Radu Gabriel Bozomitu, Marian Alexandru Corban, Adrian Popa	138
26	<i>A New Remote System for Monitoring Physiological Parameters of Elderly People</i>	Teofil Ilie Ursache, Radu Gabriel Bozomitu, Cristian Rotariu	144
27	<i>Decision support prototype for farmers based on environmental parameter modelling through supervised machine learning</i>	Maria Lămășanu, Dragos Ioan Sacaleanu, Irina Petra MANCIU, Rodica-Claudia Constantinescu, Lucian Perișoară	148
28	<i>A study on multi-modal LLM reasoning for defect detection</i>	Andrei Tulbure, Dermina Danciu, Eva Dulf, Adrian Tulbure	153
29	<i>On calibration of the magnetometer with the help of the gyroscope</i>	Septimiu Mischie	158
30	<i>Characterizing Thermal Properties of 18650 Lithium-Ion Battery Cells: Experimental Approaches to Thermal Conductivity and Specific Heat Capacity Measurements</i>	Adelina Ilies, Rajmond Jano	163
31	<i>Conceptual model of a parking system with automatic license plate recognition</i>	Irena Valova, Tsvetelina Kaneva, Nikolay Valov	168
32	<i>Innovations in Electric Vehicle Supply Equipment: Towards Smart Agriculture</i>	Mircea-Alexandru Călin, Paul Svasta	174
33	<i>Design and implementation of a low-cost modular electronic system for home automation based on IoT</i>	Vladimir Tsankov, Boris Evstatiev, Irena Valova	178
34	<i>Measurement and Analysis of Electroencephalogram (EEG) Signals Using Pre-Amplification and Filtering Techniques</i>	GOMBOȘ ANDREEA, Pena Madalina, Emilian CEUCA	184
35	<i>Non-Invasive Assessment of Hydration Status Using Bioelectrical Impedance Analysis</i>	Pena Madalina , GOMBOȘ ANDREEA, Emilian CEUCA	189
36	<i>Intelligent System for Investigating the Effects of the Environment on the Human Brain</i>	GOMBOȘ ANDREEA, Pena Madalina , Emilian CEUCA, Steau Claudiu	193
37	<i>Intelligent Emergency Braking System for Bicycle</i>	Pena Cosmin, Pena Madalina , Emilian CEUCA, GOMBOȘ ANDREEA	197
38	<i>Investigating Optimal Feedback Functions of Second Degree for Nonlinear Feedback Shift Registers Using Computer-Based Tools</i>	Adriana Borodzhieva	201
39	<i>Implementing Boolean Four-Input Functions with Multiplexers when Applying Project-Based Learning in the Digital Electronics Course</i>	Adriana Borodzhieva	207
40	<i>A Methodology for Designing Phase-Correction Sections Using an Active Implementation with an Operational Amplifier</i>	Adriana Borodzhieva	213

41	<i>Algorithms For Processing Signals of Alcohol Consumption Detecting Sensors And Engine Control Interface In Traffic</i>	Daniela Ioana, Irina Bacis, Rodica Negroiu	218
42	<i>Development of an Electronic Monitoring System for a Savonius Wind Turbine</i>	Gheorghe Alexandru Matusa, Marius Mares, Paul Svasta	222
43	<i>Master-Slave BMS Architecture with CAN-bus for Inter-Cell Communication</i>	Lucian-Andrei Perișoară, Irina-Bristena Bacis, Dragos-Ioan Sacaleanu	227
44	<i>Low-Frequency Dielectric Tests of PLA/Flax Sustainable and Degradable PCB Substrates</i>	Attila Géczy, Oliver Krammer, Zoltán Ádám Tamus, András Csiszár	233
45	<i>Numerical Measurement System of Fluid Flows in Pipelines Without Affecting the Integrity of the Pipeline</i>	Irina Bacis, Ciprian Ionescu, Rodica Negroiu	237
46	<i>Application of IoT Technologies as a University Project for Students: Challenges and Possibilities</i>	Tsvetelina Kaneva, Irena Valova	242
47	<i>An interactive visualisation tool for circular economy and building materials recovery</i>	Ioan Cosma, Ioana Petre, George Suciu, Cosmina Stalidi, Andrei Danila	251
48	<i>Automated Greenhouse</i>	Vlad Veliciu, Vlad Cristescu, Viman Liviu	255
49	<i>Investigating the Copper Peel and Solder Joint Shear Strength on Biodegradable Substrates</i>	Oliver Krammer, Gergő Hambuch, Réka Bátorfi, Balázs Illés, Attila Géczy	262
50	<i>Linearity Evaluation and Influence of the Reference Voltage for ADC Converter of Embedded Devices</i>	Ionel Baci, Gabriel Chindris, Marius-Alexandru Taut	266
51	<i>Concept and Challenges in Microcontroller Artificial Intelligence Development</i>	Cosmina Corches, Adelina Ilies, Mihai Daraban, Gabriel Chindris	270
52	<i>Automated control system for photovoltaic panel</i>	Vlad Silviu, Stefan Rosu, Rodica-Claudia Constantinescu	274
53	<i>On the Forgetting Factors of the RLS Algorithm Based on Third-Order Tensor Decomposition</i>	Radu Otopoleanu, Constantin Paleologu, Jacob Benesty, Camelia Elisei-Iliescu, Cristian-Lucian Stanciu, Cristian Anghel	282
54	<i>Dynamic Adaptation Algorithm of LoRa Communication Parameters in Wireless Sensor Networks</i>	Irina Petra MANCIU, Vlad Stefan Nadoleanu, Dragos Ioan Sacaleanu, Lucian Perișoară, Rodica-Claudia Constantinescu	286
55	<i>Addressing the Skills Gap in Microelectronics – Development and Validation of Reactive Response in the Project European Chips Skills Academy</i>	Ali Gharaibeh, Oliver Krammer, Victoria Cummings	291
56	<i>Optimizing Power Consumption: A Comparative Analysis of Radio Modules used in Embedded Systems</i>	Marius Mares, Gheorghe Alexandru Matusa, Corina Ruxandra Mitulescu, Paul Svasta	295
57	<i>Assessment on measuring and estimation of Ragone plots</i>	Ciprian Ionescu	299
58	<i>Education 5.0: Transforming Engineering Education in the Age of Generative AI</i>	Monica Ciolacu, Cristina Marghescu, Mirela Sorecau, Bogdan Mihailescu, Emil Sorecau, Paul Bechet	303
59	<i>New Evaluation for Thermal Diffusivity of High Power Devices with Different Packages</i>	Corina Ruxandra Mitulescu, Norocel Codreanu, Marius Mares, Bogdan Mihailescu, Paul Svasta	309
60	<i>Understanding Electrochemical Migration Behavior in Fe2O3-Enhanced SAC Lead-Free Alloys</i>	Ali Gharaibeh, ALI DAYOUB, Bálint Medgyes	314
61	<i>Comparative Workbench Study about MTBF for PoL Buck-Converters: Asynchronous vs. Synchronous</i>	Dan Butnicu, Radu Tristu	320
62	<i>Thermal Simulations and Characterization of High-Power LED Boards</i>	Alexandra Fodor, Ana Cristina Davidas, Alin Grama, Elena-Mirela Stetco, Adelina Ilies, Rajmond Jano	324
63	<i>IoT Beehive Monitoring System</i>	Tudor Pica, Cristina Marghescu, Rodica Negroiu	328

64	<i>Research for the Realization and Testing of an Adaptive, Programmable Dosing System for Hydro Electrolytic Balancing (SDAEH)</i>	Irina Bacis, Crenguta SERBANOIU, Alexandru Vasile, Daniela Ioana	332
65	<i>Optimal energy management for an islanded microgrid with battery degradation cost considerations</i>	Eniko Szilagyi, Dorin Petreus, Patarau Toma	337
66	<i>Electromagnetic shielding fabrics with antimicrobial properties for healthcare</i>	Ion Razvan Radulescu, Laurentiu Dinca, Elena Perdum, Cezar Lupescu, Ovidiu Iordache, Bogdan Cazan, Raluca Aileni	343
67	<i>Monitoring System with Autonomous Power Supply and Remote Radio Transmission</i>	Andrei Drumea, Daria Dedu, Cristina Marghescu, Rodica Negroiu,, Mihaela Pantazica	348
68	<i>Comparative Analysis of Active Balancing Types for Lithium-Ion Cells</i>	Mirela Olteanu, Dorin Pereuş, Anamaria Simionas	352
69	<i>Bearing Fault Identification with the Application of Kalman Filter</i>	Ioan Szabo, Andrei Tulbure, Adrian Tulbure	358
70	<i>Web platform for designing a hydropower system</i>	Bogdan Alexandrescu, Rodica-Claudia Constantinescu, Andrei Neacsu, Lucian Perişoară	362
71	<i>Development of Automotive-mobility Training in the TRIREME project</i>	Balint Medgyes, Csaba Farkas, Marek Spanyol, Stefano Danieli, Elena Cantiani, Jakub Stolfá	366
72	<i>Impact of Fe-NPs doped flux on electromigration in Sn-based solder joints of chip-sized SMD components at lower Joule heating</i>	Irina Wodak, Attila Geczy, Oliver Krammer, Golta Khatibi, Andriy Yakymovych, Farzad Khodabakhshi	370
73	<i>Enclosure with Underground Passive Cooling System for High Power Vehicle Charging Station</i>	Mohit Dubey, Otto Kreutzer	374
74	<i>Considerations regarding environmental testing of a solderless assembly for electronics module</i>	Gaudentiu Varzaru, Roxana Tulea, Bogdan Mihailescu, Mihai Branzei, Paul Svasta	382
75	<i>Haptic system for the remote control of a robotic structure</i>	Andrei Toma, Cristian Constantin Molder, Gheorghe-Alexandru Mătuşa	386
76	<i>Remote controlled automatic test bench</i>	Ioan Lie, Andrei Zimbru, Septimiu Lica	396
77	<i>Integration of UHF RFID sensors in railway maintenance systems</i>	Ion Nicolae Stancel, Maria Claudia Surugiu	401
78	<i>Sun Position Simulator for Solar Cell Testing and Characterization</i>	Cristian Farcas, Ionut Ciocan, Adrian Tulbure	405
79	<i>Stand for testing the lifetime of an automotive electronic module</i>	Ioan Lie, Teodor-Andrei Vilceanu, Septimiu Lica	410
80	<i>Electronic Apiary Monitoring System with Built-in Sensors and Motorized Hive Access Control</i>	George Florea, Norocel Codreanu, Vlad Preda, Vlad Alexandrescu	416
81	<i>A Cloud Computing Solution for Quality Management Systems in Multi-Site Enterprises</i>	Nadia Ionescu, Laurentiu Mihai Ionescu, Laurentiu-Mihai Ionescu, Luminita-Elena Stirbu, Cosmin Stirbu, Alin-Gheorghita Mazare	421
82	<i>Signal Integrity Analysis on eMMC Interface</i>	Octavian Axinte, Mihai Daraban	426
83	<i>Power Integrity Analysis of a Power Line Between a DDR4 Memory and a Controller</i>	Alex-Ioan Marina, Mihai Daraban	432
84	<i>Industrial Greenhouse Monitoring and Forecasting System</i>	Bogdan Alexandrescu, Rodica-Claudia Constantinescu, Oana Mihaela Maria Tudor	436
85	<i>Prediction of the Magnetic Interaction between Atoms using a Neural Network</i>	Bogdan Alexandrescu, Rodica-Claudia Constantinescu, Alexandru Haidarli	440
86	<i>Advanced Electronics System for the Improvement of Concrete Factories Management</i>	George Florea, Norocel Codreanu, Vlad Alexandrescu	444

87	<i>The Development and Electrical and Morphological Characterization of some Electrodes on the Sponge Structure used in the Realization of Supercapacitors</i>	Rodica Negroiu, Cristina Marghescu, Irina Bacia, Irina Burcea, Laurentiu Dinca, Ion Razvan Radulescu	448
88	<i>Intelligent System for Integration in 5G Networks</i>	Eduard Gabriel Stanescu, Ciprian Zamfirescu, Teodora Cristina Stoian, Dumitru Iulian Nastac	452
89	<i>Technologies of Interconnections in Electronics – Signal and Power Integrity Student Contest</i>	Mihai Daraban, Marcel Manofu, Radu Voina	458
90	<i>Design and Implementation of a Temperature Monitoring System for the Safety of Electric Vehicle Transport on Maritime Transport</i>	Moise Vasile Madalin, Oncioiu Cosmin, Marius Vochin	462
91	<i>DeFraudify4ALL: Prototyping and Validation of a System for Fraud Detection with Big Data and Cloud Technology</i>	Eduard Cristian Popovici, Cosmina Stalidi, Dan Alexandru Teodoras, George Suciu, Ioan Cosma	466
92	<i>Influence of the Electrodes Porosity on the Supercapacitors' Charging Performance</i>	Daniela Ionescu, Dan Butnicu	471
93	<i>PCB temperature controller for automated soldering</i>	Vlad Cristescu, Vlad Veliciu, Viman Liviu	475
94	<i>A Blockchain Solution for Risk Management in Industry</i>	Laurentiu Mihai Ionescu, Laurentiu-Mihai Ionescu, Nadia Ionescu, Maria-Daniela Bondoc, Iuliana Grecu, Alin-Gheorghita Mazare, Cosmin Stirbu	479
95	<i>Increasing the Specific Energy of Environmental Friendly EDLC and Pseudocapacitors</i>	Daniela Ionescu, Maria Kovaci	483
96	<i>Advanced Collaboration in the Romanian Electronics Field based on the TIE Professional Student Contest</i>	Mihai Marian Cenusu, Viman Liviu, Norocel Codreanu, Paul Svasta, Bogdan Popescu, Florin-Alexandru Durus, Mihaela Pantazica	487
97	<i>Flexible Supercapacitors for Energy Supply in Smart Textiles – Applications and Prototype</i>	Ion Razvan Radulescu, Cezar Lupescu, Elena Perdum, Laurentiu Dinca, Rodica Negroiu	494
98	<i>Solar Powered Raspberry Pi for Internet of Things and Wireless Sensor Networks</i>	Vladimir Voicu, Dorin Petreus, Radu Etz	500
99	<i>TIE Micro – Chiplets and Next-gen Packaging</i>	Catalin Bogdan Ciobanu, Dan Manolescu, Roxana Vladuta, Luciana Chitu, Cosmin Moisa, Marcel Manofu, Paul Svasta	504
100	<i>Electronic Device Price Prediction using Machine Learning</i>	Streitferdt Roland Sebastian, Adrian Taut, Gabriel Chindris	512
101	<i>A Qualitative Inquiry into Student Competitions in Electronics in Romania</i>	Toma Ursutiu, Gabriel Chindris, Marius Taut, Raul Fizesan, Adrian Taut	516