

2025 IEEE Symposia on Computational Intelligence for Energy, Transport and Environmental Sustainability (CIETES 2025)

**Trondheim, Norway
17-20 March 2025**



**IEEE Catalog Number: CFP25ZZ5-POD
ISBN: 979-8-3315-0826-5**

**Copyright © 2025 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:	CFP25ZZ5-POD
ISBN (Print-On-Demand):	979-8-3315-0826-5
ISBN (Online):	979-8-3315-0825-8

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

Table of Contents

- 1 Real-Time Lithium-Ion Battery Capacity Curve Recovery and High-Precision RUL Prediction in the Presence of Capacity Data Loss
Yixin Nie (Tsinghua University); Anqi Wang (Tsinghua University); Zhi Lu (Tsinghua University); Zhiyu Zhang (Tsinghua University); Liqin Yan (Shanghai Institute of Space Power-Sources); Jingying Xie (Shanghai Institute of Space Power-Sources); Fan Yang (Tsinghua University)*
- 8 Split Computing in Autonomous Mobility for Efficient Semantic Segmentation using Transformers
Chris Ulicny (Technical University of Kosice); Robert Rauch (Technical University of Kosice); Juraj Gazda (Technical University of Kosice); Zdenek Becvar (Czech Technical University in Prague)*
- 16 Reinforcement Learning for Sustainable Maritime Transportation: Reshaping Adaptive Stress Testing
*Thomas Steinfeldt Laursen (Norwegian University of Science and Technology); Ole Mengshoel (Norwegian University of Science and Technology)**
- 23 Beyond the Smudge: Simulating Opaque and Transparent Automotive Camera Lens Soiling
Tim Eberhardt (Dr. Ing. h.c. F. Porsche AG); Wilhelm Stork (Karlsruhe Institute of Technology); Tim Bruehl (Dr. Ing. h.c. F. Porsche AG); Robin Schwager (Dr. Ing. h.c. F. Porsche AG); Tin Stribor Sohn (Dr. Ing. h.c. F. Porsche AG)*
- 32 On Scalable Design for User-Centric Multi-Modal Shared E-Mobility Systems using MILP and Modified Dijkstra's Algorithm
*Maqsood Shah (Dublin City University); Ji Li (University of Birmingham); Mingming Liu (Dublin City University)**
- 41 Comparative Analysis of Machine Learning-Based Imputation Techniques for Air Quality Datasets with High Missing Data Rates
Sen Yan (Insight Centre for Data Analytics, Dublin City University); David O'Connor (Dublin City University); Xiaojun Wang (Dublin City University); Noel Connor (Home); Alan Smeaton (Insight Centre for Data Analytics, Dublin City University); Mingming Liu (Dublin City University)*
- 49 Optimizing Takagi-Sugeno Fuzzy Models For Improving Leak Detection in Water Distribution Networks
Qusai Khaled (Eindhoven University of Technology); Uzay Kaymak (Eindhoven University of Technology); Laura Genga (Eindhoven University of Technology)*
- 57 Machine Learning in Sensors: Feature Learning from Complex Spectra in mmWave Radar

Signals

Erkan Karakus (University of Rhode Island); Tao Wei (University of Rhode Island); Qing Yang (University of Rhode Island)*

- 66 Optimized Control of Single-Stage Grid-Connected PV Inverters with Embedded ANN based MPPT
*Yacine Triki (Université Mouloud Mammeri de Tizi -Ouzou); Ali BECHOUCHE (Université Mouloud Mammeri de Tizi -Ouzou); Hamid Seddiki (Mouloud Mammeri University, Tizi-Ouzou); Djaffar OULD ABDESLAM (University of Haute Alsace)**
- 72 Active Learning guided Gaussian Process Regressor for Non-Linear PDE Modeling for environmental simulations
Soumen Sinha (TU Delft); Lara Bastos (TU Delft); Rajen Kumar Sinha (IIT GUWAHATI)*
- 79 A Genetic Algorithm based Deterministic Multi-step Peer-to-Peer Power Routing for Energy Internet in Sparsely Connected Microgrid Communities
Neethu Maya (Indian Institute of Science); Narasimman Sundararajan (Nanyang Technological University); Suresh Sundaram (Indian Institute of Science)*
- 85 Dynamic Ensemble Short-Term Load Forecasting for Residential Building with Low Data Availability: SARIMA vs. LSTM
Lakshimi Narayanan Palaniswamy (Karlsruhe Institute of Technology); Tim Kappler (Karlsruhe Institute of Technology); Nina Munzke (Karlsruhe Institute of Technology); Marc Hiller (Karlsruhe Institute of Technology)*
- 94 Efficient Curation of Invertebrate Image Datasets Using Feature Embeddings and Automatic Size Comparison
Mikko Impiö (Finnish Environment Institute Syke); Philipp Rehsen (University of Duisburg-Essen); Jenni Raitoharju (University of Jyväskylä)*
- 100 HotSD-Net: Convolutional Neural Network for Estimation of Hot Spots in Photovoltaic Modules via Infrared Imaging
*Luis Montanez (CIO); Juan Reyes-Luévano (TecNM/Instituto Tecnológico de Aguascalientes); Luis Valentín-Coronado (Centro de Investigaciones en Óptica, A.C.); Daniela Moctezuma (CentroGEO); Fernando Lezama (GECAD-Polytechnic of Porto); Zita Vale (GECAD/Polytechnic of Porto)**
- 106 Game-Theoretic Approach for Cooperative Planning of Active Distribution Networks and Private Electric Vehicle Charging Stations
Mario Mejia (UNESP); Leonardo H. Macedo (São Paulo State University (UNESP)); Gregorio Muñoz-Delgado (University of Castilla-La Mancha); Javier Contreras (University of Castilla-La Mancha); John F. Franco (São Paulo State University (UNESP))*
- 112 Data-Driven Fraud Detection in Active Participation Programs of End-Use Energy

Consumers Based on a Hybrid Fuzzy Approach

Guilherme Carvalho (GECAD/Polytechnic of Porto); Zita Vale (GECAD/Polytechnic of Porto); Luis Gomes (GECAD/P.PORTO); Ricardo Faia (GECAD/IPP); Edson Costa (IFMA)*

- 119 Litter detection in Real-World Environments using YOLO models

Alberto Espinosa (Centro de Investigación en Computación); Fernando Aguilar-Canto (CIC IPN); José Torres-León (Center for Computing Research - Instituto Politécnico Nacional); Diana Laura Vergara-Sánchez (Centro de Investigación en Computación); Marco Moreno Armendariz (Instituto Politecnico Nacional); Hiram Calvo (Center for Computing Research - Instituto Politécnico Nacional)*

- 126 Optics-informed deep learning training for classifying gas absorption spectra on the edge

Manos Kirtas (Aristotle University of Thessaloniki); Loukia Avramelou (Aristotle University of Thessaloniki); Carlos Alonso Ramos (CNRS, Univ. Paris-Sud, Université Paris-Saclay); Sara Toxqui Rodríguez (CNRS, Univ. Paris-Sud, Université Paris-Saclay); Aitor Villafranca Velasco (Spanish National Research Council); Nikolaos Passalis (Aristotle University of Thessaloniki); Christos Pappas (Aristotle University of Thessaloniki); Nikolaos Pleros (Aristotle University of Thessaloniki); ANASTASIOS TEFAS (Aristotle University of Thessaloniki)*

- 132 Automated Phytosensing: Ozone Exposure Classification Based on Plant Electrical Signals

Till Aust (University of Konstanz); Eduard Buss (University of Konstanz, Department of Computer and Information Science, Konstanz, Germany); Felix Mohr (Universidad de La Sabana); Heiko Hamann (University of Konstanz)*

- 139 Optimizing Industrial E-Waste Recycling with Attention-Driven Deep Learning for PCB Segmentation Using Hyperspectral Imaging

Trishna Barman (Ulster University); Sonya Coleman (School of Computing and Intelligent Systems, University of Ulster); Dermot Kerr (Ulster University); Justin Quinn (Ulster University); Shane Harrigan (Ulster University)*