2026 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2026)

Montreal, QC, Canada
18-20 May 2026

Pages 1–590

IEEE Catalog Number: CFP26758-POD
ISBN: 979-8-3315-8841-0

IEEE Advancing Technology for Humanity

Copyright © 2026, IEEE

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:	CFP26758-POD
ISBN (Print-On-Demand):	979-8-3315-8841-0
ISBN (Online):	979-8-3315-8840-3

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

Subject Leakage and Label Circularity in Deep Learning Models for Alzheimer's Disease Prediction 1
Maximilien Oosterhuis, Qian Liu

Breast cancer radiogenomics analysis via computational perturbation on AI-driven multi-omics guided image synthesis 7
Xingying Zhang, Qian Liu

Multi-Mode Multi-Band Integrated Sensing and Communication Technique for Real-Time Healthcare Monitoring 13
Thomas Micallef, Xiaoqiang Gu, Ke Wu

Slip-Correction Methods for Improved Dead Reckoning in Autonomous Wheeled Robots 18
J. Diab, B.W. Surgenor

A Compact Multi-Task Architecture for Age-Invariant Face Recognition 24
Ahmed Elnakib, Andrew Rosen, Abdallah S. Abdallah, Asmaa A. Hekal

Challenges of Centralized Remote Power Smoothing Strategies for AI Data Center Loads 30
Abdullah Alfarra, Abdallah F. El-Hamalawy, Ahmed Abd Elaziz Elsayed, Hany E.Z. Farag

Hybrid Predistortion of RF Power Amplifiers with Nearly 25% Reduction in Digital Predistortion Complexity 36
Mustafa Elarbi, Ammar Kouki, Noureddine Outaleb

PSAR-FRR: Port-State–Aware Neural Fast Reroute for Hybrid SDN Networks 41
Md Imtiaz Ahmed, Yaser Al Mtawa

Uncovering Language Bias in ChatGPT's Code Generation Across Contexts 48
Munima Jahan, Rahnuma Jahan

Spatial-Temporal Reinforcement Learning for False Data Injection Detection in Smart Home Energy Management Systems 53
Jihong Zhang, Sima Hamedifar, Shichao Liu

Developing a Numerical Scattering Simulation Approach for Frost Flowers on Sea Ice using FEKO 59
Fahimeh Tavakoli, Saman Dehghan, Vladimir Okhmatovski, Dustin Isleifson

Measurement of the Vertical Resistance of Silver-Based Backside Metallization for Die-Attach in Power Electronics Packaging 65
Mohamed Lamine Faycal Bellaredj, Goran Miskovic

Beyond Peak Field Enhancement: Theoretical Framework for Emitter Participation and Scaling in Nanocarbon Field Emitter Arrays 70
Angus Lee

Food-101 Classification with TransNeXt: A Study of Fine-Tuning and Model Scale 78
Aziz Al-Najjar, Tariq Elbahrawy, Marzieh Amini, James R. Green, Felix Kwamena

Toward Objective Measurement of Knee Joint Laxity Using Wearable Ultrasound Motion Tracking 84
Amirhossein Shahshahani, Zeljko Zilic, Sharmistha Bhadra

Development of an SIS–LMS Convergence and AI Integration Framework for Higher Education in the Philippines 88
Arlene B. Canlas, Rosita E. Canlas, Cherry D. Casuat

Partial Privacy for Sensitive Subsets in Deep Learning Models 95
Mohammadhadi Shateri, Borna Sayedana

Learning to Listen: AI-Based Inference and Interference Management in Smart IoT Clusters 101
Azar Zarei, Mahdi Zareei

Reduced-Order Aggregated PV Park Models for EMT Simulation Based on Higher-Order DMD 107
Aboubacar Abdou Dango, Alireza Masoom, Innocent Kamwa, Himanshu Grover

AI-Enhanced and Data-Driven Reduced-Order Modeling for the EMT Simulation of IBR-based Networks 114
Aboubacar Abdou Dango, Innocent Kamwa, Alireza Masoom, Himanshu Grover

Machine-Learning based Jitter Estimation in Clock-Forwarding Parallel Interface Circuits 120
Ahsan Javaid, Ramachandra Achar

AI-TwinRadar: A Virtual Radar ECU for Scenario-Based ADAS Testing and Validation 124
Daniel Carvalho Ramos, Jeferson José Lima, Marcos Tolentino Dornelas, Luiz Henrique Maia Max Mauro Dias Santos

Scalable HLS ECO via Hybrid MCS-GED 132
Alireza Azadi, Paul Rigge, Ethan Mahintorabi, Kenneth B. Kent

A Two-Chip Solution for 10Gb/s PON Optical Receivers Reaching Sensitivities up to -26dBm or Better Using 3.3V Photodiode and Electronics 140
Shakeeb Adullah, Jorden Labossiere, Jim Hjartarson, Larry Tarof, Rony E. Amaya

Temporal Modeling of Keypoint-Trajectory Interactions under Data and Compute Constraints 145
Sibi Parivendan, Kashfia Sailunaz, Suresh Raja Neethirajan

Polycrisis Ready EV Charging: Hotspot to KPI Roadmapping for Resilience and Equity 151
Olfat Ganji Bidmeshk

Ensemble Learning-Based Domain Generalization for Bearing Fault Diagnosis 158
Shuzheng Zheng, Thambirajah Ravichandran, Yuan Liu, Kshirasagar Naik, Marzia Zaman

Artificial Intelligence Framework for Early Failure Detection in Concrete Structures Based on Machine Learning and Acoustic Emission Monitoring 164
Nancy A. Hassan, Ibrahim Al-Nahhal, Ahmed A. Abouhussien

CDEAR: A Coordinated Dual-End Adaptive Driving Scheme for Voltage Compensation in Memristor Crossbar Arrays 170
Jin Shi, Junqi Huang, Nandha Kumar T., Haider A.F. Almurib

A Brief History of the URSI-ITU Relationship 176
David G. Michelson

Enhancing IoT Security Through a Zero Trust Hub with Explainable AI and Blockchain Support 181
Mandeep Pannu, Richard Frank

Placement of Logical Functionalities subject to Traffic Fluctuations 189
Sebastian Racedo, Brigitte Jaumard, Oscar Delgado

Explainable Pan-Cancer Classification and Biomarker Discovery from mRNA Gene Expression 195
Farzana Tabassum, Sabrina Islam, Siana Rizwan, Masrur Sobhan, Tasnim Ahmed, Sabbir Ahmed Tareque Mohmud Chowdhury

A Machine Learning Based Classification and Reliability Framework for Fire Related Emergency Calls 201
Herson Aldrich Dulay, Patrick Capito, Christian Villafranca, Rowland Afun, Angelo Divinagracia Mahdi Daghmehchi Firoozjaei

Path Planning for Industrial Robotic Sanding Using Deep Reinforcement Learning 207
Kyung Tae Kang, Jixian Jia, Feng Hu, Chengyan Tan, Jun Tan, Michal Aibin

A Scalable 64-Channel Ultra-Stable Bipolar Current Supply for Precision Magnetic Field Control 214
Shomi Ahmed, Jeffery W. Martin, Amala Jaison, Blair Jamieson, David C.M. Ostapchuk, Mark McCrea Wolfgang Klassen, Modeste Katotoka

Gender-Based Heterogeneity in Youth Privacy-Protective Behavior for Smart Voice Assistants: Evidence from Multigroup PLS-SEM 220
Molly Campbell, Yulia Bobkova, Ajay Kumar Shrestha

ISS-Based Cascade Analysis of Delay-Coupled Oscillator Coordination for Constrained Humanoid-Inspired Systems 226
F. Mnif, M. Saad

SEE response of COTS Voice-controlled smart speakers under neutron irradiation 232
M. Sharma, J. Cardenas Chavez, S.J Wen, A. Noguera Cundar, L. Chen

Fuzzy Logic-Based Intelligent Energy Management for Vehicle-Integrated Photovoltaic Considering Panel Dynamic Geometric Variations. 237
Hyacinthe Tchakounte, Akrem Mohamed Aljehaimi, Pragasen Pillay

Multi-Class or Binary? A Comparative Analysis of Machine Learning for Post-Wildfire Severity Mapping 243
Annabelle Sun, Alyn Xu, Junyu Lyu, Yuheng Miao, Xinchang Meng, Michal Aibin

EV Charging Demand Prediction Considering Environmental Condition and User Behavior 249
Hussein A. Taha, Ahmed Abdelrahman, Abdelhamid Mammeri

Realistic Phase-Shifter Quantization Effects on Near-Field Beamfocusing Performance in XL Arrays 256
Matthew Mora, Yuanzhe Gong, Robert Morawski, Tho Le-Ngoc

Neuro Symbolic Prognostics for Autonomous Cyber Physical Systems 262
Gitanjali Gupta, Sukhjit Singh Sehra

Radar and Radio Astronomy: the Dual Legacy of Ruby Payne-Scott 268
Gregory E. Coxson, William Haloupek

Sea Ice Classification Enhancement Using Brier Loss based Calibration 275
Nima Ahmadian, Matthew Hamilton, Weimin Huang

Domain-Adaptive YOLOv9 for Foggy-Weather Object Detection Using Partial Spatial Self-Attention 279
Ziqi Xiao, Yuan Ma, Jason Gu

Protecting OSPF Against Cyber Attacks by Sharing a Few Large Integers Among Routers 285
Morteza Moghaddassian, J.J. Garcia-Luna-Aceves

The Rise and Fall of Canada's Radar Industry: Research Enterprises Limited, 1940-46 291
David Zimmerman

Proactive Detection of Sandbed Formation in Hydrotransport Pipelines via Multi-Depth Sonar Profiling and Bidirectional LSTM 296
Lei Yang, Muhammad Burhan, Simon Sun, Quamrul Huda

Visual Analytics for Understanding Curriculum Learning and Generalization in PPO Agents 302
Qi Zhang, Andrew Reppen

Exploring Social Determinants of Health and Population Risk Using U.S. Census-Tract Data 308
Qi Zhang

Hybrid Wavelet Neural Network–ANN–Kalman Filter Framework with Dynamic Ensemble Weighting for Short-Term Load Forecasting 314
Mahmoud Kiasari, Hamed Aly

Closed-Loop Digital Twin for Risk-Aware Dynamic Operating Envelopes in Distribution Feeders 320
Mehrnaz Ahmadi, Hamed Aly

Agentic Datasets as an Engineering Control Plane 326
Alexander Chernov

Comparative Evaluation of CNN-RNN, 3D-CNN, and Transformer Models for Individual-Centric Poultry Behavior Recognition 333
Daniel Edison Essien, Suresh Neethirajan

Performance and Overhead in Data-Driven and XAI-Driven Federated Learning for Electricity Theft Detection 340
Islam Elgarhy, Tarek Kandil, Abdallah S. Abdallah

Deep Learning for Automatic Fetal Head Circumference Measurement: A Comparative Study 346
Mir Md Taosif Nur, Sumaiya Sultana Dola, Qian Liu, Camilo E. Valderrama

A Bilevel Computation Migration and Power Management Framework for Coordinating Data Centers with Inter-Regional Electric Loads 354
Luyang Hou, Di Wu, Chengming Hu, Guolin Lyu, Lei Liu, Weiming Shen

Benchmarking of Post-Quantum Digital Signature Schemes on ESP32 and Raspberry Pi Platforms 361
Feten Ben Ahmed, Cédric Labrecque, Aref Meddeb

A Fuzzy Optimization Framework for Resilient Line-Wise Power System State Estimation 367
Amir Reza Nikzad, Bala Venkatesh, Fernanda C. L. Trindade

Scalable Infrastructure with Load Balancing and Elasticity 373
Arif Fahem Khan, Zamir Hassan, Jesse Paufler, M. Ali Akber Dewan

Neural Decoding of Music Effects on Mental Fatigue States 381
Abdelhadi Hireche, Abdalla A. R. M. Hamid, Nour Faris Ali, Mohamed Atef, Ibrahim M. Elfadel Herbert F. Jelinek, Abdelkader Nasreddine Belkacem

Distributed Resilient Secondary Control of Smart Grid Under Sensor FDI Attacks 388
Jin Li, Youmin Zhang

Network Analysis of Psychosocial Stress and Discrimination Among Frontline Healthcare Workers in British Columbia During the COVID-19 Pandemic 394
Pradhyuman Nandal, Michelle Smith, Bala Nikku, Nisha Puthiyedth

Integration of Degradation-Aware Green Hydrogen Systems into Electricity Markets 404
Venkata Balaji Thummalacherla, Kankar Bhattacharya

Machine Learning-Assisted Characterization of Top-Contact Pentacene Thin-Film Transistors 410
Farzad Mozafari, Majid Ahmadi, Ali Mozafari

Fred, the Friendly Editor 416
John Aycock

PoB-MDRL: Multi-Agent Deep Reinforcement Learning-Based Joint Power Allocation and Beamforming for Heterogeneous Services under Non-Ideal Network Conditions 422
Ohood Sabr, Georges Kaddoum, Kuljeet Kaur

Training Strategies for Imbalanced Single-Task and Multitask Electrocardiogram Classification 429
Joshua Tiffany, Qi Zhang

CowPainCheck: Temporal Deep Learning for Postoperative Pain Detection in Cattle with Edge–Fog–Cloud Deployment Considerations 435
Shivam Patel, Stelio P L Luna, Sibi Parivendan, Suresh Neethirajan

Multi-Expert Fusion with Confidence-Aware Abstention for Macro-Behavior Classification of Cow Vocalizations 443
Mayuri Kate, Suresh Neethirajan

MKATrack: Enhancing Single Object Tracking using Kronecker Adapters 449
Ahmed Elgazwy, Omar Abdelaziz, Mahmoud Soliman, Mohamed S. Shehata

Evaluating the Predictive Value of Dairy Cow Postures for Milk Yield Using Explainable AI 455
Kashfia Sailunaz, Shreya Rao, Suresh Raja Neethirajan

Deep Reinforcement Learning-Enabled Anti-Reactive Jamming Strategies for Mobile Cell-Free Interference Networks 461
Tri Nhu Do, Georges Kaddoum, François Leduc-Primeau

Detection and Prediction of Demagnetization fault for PMSMs Based on 3D–FEA and AI Technology 467
Yacine Maanani, Chuan Pham, Qingsong Wang, Kim Khoa Nguyen, Kamal Al-Haddad

Preprocessed Features Identification and Isolation Forest Machine Learning for GNSS Spoofing Detection 473
Xinghao Zuo, Harry Leib

Agentic AI System for End-to-End Curriculum Generation 481
Razan Mohamed, Emad A. Mohammed

Distributionally Robust Grid Forming Virtual Oscillator Control for Inverter Networks under Unbalanced Loads 487
Maryam Bazyari, Javad Fattahi

A Multi-Criteria Decision Framework for Site Selection of Hyperscale Data Centers 493
Avantika Nair, Hany E.Z. Farag

Beamforming with a Nearby Saturating Interference - Approximate Underwater Acoustic Sensor Model 499
Stéphane Blouin

Range and Velocity Tracking: a Parameter-Based Approach for Block Time-Varying Channels 505
Mohammed Kamel AbuFoul, Deeb Assad Tubail, Mohammed Zourob, Salama Ikki

Polyharmonic Spline Modelling of Tissue Deformation for Ultrasound-Guided Surgery 511
Kian Zalzalah, Alec Cotton, Carlos Rossa

Neuro Symbolic Prognostics for Autonomous Cyber Physical Systems 517
Gitanjali Gupta, Sukhjit Singh Sehra

Probabilistic Denoising-Enhanced Parameter Estimation for Multi-Target Detection 523
Nghia Thinh Nguyen, Tri Nhu Do

Adaptive Voltage Stability Enhancement of Critical Induction-Motor Systems Using a Bidirectional Three-Phase Solid-State Transformer 529
Khaled Ghambirlou, Adel Ali Abosnina, Gerry Moschopoulos

Sign2Voice: A Stability-Driven Streaming Pipeline for Real-Time Sign-to-Speech Translation 535
Ziyue Zhang, Dwarkesh Patel, Trisha Reddy Kilaru, Krisha Sakalsawala, Yang Liu

FedWeaver: Weaving Specialist Threads into a Resilient Global Model for Parameter-Efficient Federated Domain Generalization 542
Mahmoud Soliman, Omar Abdelaziz, Ahmed Elgazwy, Mohamed S. Shehata

Evaluating Cross-Dataset Robustness of EEG Emotion Recognition Under Wearable Channel Constraints 550
Sunday P. Emmanuel, Camilo E. Valderrama

On the Superiority of Ontario Electricity Demand Forecasting with Lagged Predictors 556
Sulalitha Bowala, Shalini Jayanetti, Avanthi Saumyamala, Md Erfanul Hoque Aerambamoorthy Thavaneswaran

A Machine Learning-Based Approach for Ranking Anomalous Consumptions in Electric Power Distribution Systems 562
Felipe Bayma B. Rolim, Bala Venkatesh, Yao Qing, Fernanda C. L. Trindade

Des Coefficients De Calcul Aux États Limites À La Fiabilité (β) : Un Flux De Travail Unifié Mef-Fiabilité Pour La Conception De Structure Avec Exploration Interactive Des Combinaisons De Charges 567
Kennet Gaston, Walid Ghie

A Practical Workflow for Thermal Hotspot Localization in Silicon ICs Using Uncooled LWIR Thermography 575
Mohamed Azan

An Extended-range Arctic Acoustic Underwater Communication Experiment 579
Michel Barbeau, Stéphane Blouin, Manuel Morgan, Nicholas Rivard, Frédéric Simard

Performance Comparison Between Model Predictive Control and Model Free Predictive Control with Double Voltage Vector Applications 585
Ahmad Darabi, Chunyan Lai

The von Mises Statistical Framework for PhDOA-Based Terrestrial Emitter Geolocation 591
Sichun Wang, Jean-Francois Beaumont

Robust Cybersecurity Using a Layered Multimodal AI System 597
L. Ali, A. Ghassemi

A UAV-Borne FMCW GPR System for Spatial Ice Thickness Measurement 604
Karran Dhillon, Abdullah Kadri

Enhancing Grid Load Predictability via Shared Representations: A Multi-Task Approach to EV Charging Behavior and Energy Demand 610
Josh Gelbaum, Paul Matsialko, Kyler Smart, Abdul Basit, Eric Cristante, Ryan Binstock, Yang Liu

TAM: Temporal Attention for Edge-Oriented Short-Term Load Forecasting 616
Muhammed Golec, Suhib Bani Melhem, Ridvan Ozturac, Saed Alrabaee

Physics-based and machine learning models for nonlinear vibration of a resiliently propped beam-mass structure 620
Mohammad Reza Talebi Bidhendi

Crackforward: Context-Aware Severity-Stage Crack Synthesis for Data Augmentation 627
Nassim Sadallah, Mohand Saïd Allili

Smart Smartphones for Mental Health 633
Aninda Roy Ani, Anik Alvi, Sabir Saheel, Tarem Ahmed, Daniel L. Chen, Zaki Wahhaj, Njogu Mbau

A Sequential-Action Proximal Policy Optimization Approach for Online 3D Bin Packing 638
Farzaneh Yousefi, Saeed Mozafari, Shahpour Alirezaee

Vision-Language-Guided UAV Navigation in Dynamic Coastline Environments 643
Jingwen Zhang, Jinxin Ye, Saeed Mozaffari, Shahpour Alirezaee

Learning to Focus: Task-Conditioned View Gating for Efficient Multi-View Visual Question Answering 649
Jinxin Ye, Jingwen Zhang, Saeed Mozaffari, Shahpour Alirezaee

Broadband Class AB Gallium Nitride Power Amplifier with Tight Gain Flatness for UHF Applications 655
Mehdi Babazadeh, Hayden Banting, Carlos E. Saavedra

Evaluation of Retrieval-Augmented Reasoning for Robotic Manipulation 660
Mohammad Arifur Rahman Bhuiyan, Saeed Mozaffari, Shahpour Alirezaee

Spatiotemporal Analysis of VIIRS Satellite Observations and Network Traffic During the 2025 Manitoba Wildfires 665
Xiang Shi, Peng Hu

EDA Framework for Systematic Generation of Biased Elementary Circuits: A Graphene FET Case Study 671
Manizheh GhaemiDizaji, Leonid Belostotski, Deji Akinwande, Laleh Behjat

Human-robot interaction for robot programming using Augmented Reality and Digital Twin 676
Mohammad Hashemi, Kasra Mojallal, Saeed Mozaffari, Shahpour Alirezaee

Incremental Balance, Position, and Heading Control of a Two-Wheeled Self-Balancing Robot: An Experimental Study 681
Ahmad T. Ramadan, Kassab Fakhoury, Obada Alhoora, Abdalrahman Matar, Mohammad A. Masadeh

DeepDefense: Robust Learning via Layer-Wise Gradient-Feature Alignment 687
Ci Lin, Tet Yeap, Iluju Kiringa, Biwei Zhang

Ensemble Machine Learning–Driven QSAR Modeling for Skin Irritation Assessment of Hazardous Compounds 695
Yunendah Nur Fuadah, Angel Metanosa Afinda, Nur Ibrahim, Nor Kumalasari Caesar Pratiwi

Enhancing Low-Rate DDoS Detection via Feature Engineering: Supervised and Unsupervised Learning 701
Alexander Loginov, Jeffrey A. Adjei, Kevin de Snayer, Srinivas Sampalli, Nur Zincir-Heywood

Critical analysis of an integrated multistage ensemble machine learning model for fraudulent transaction detection 707
Parker Wallace, Parham Shafie

SABER: Speaker-Aware Bayesian Emotion Recognition 711
Xiaoke Zeng, Soosan Beheshti

Integrated PM-DPI Framework for Uplink Traffic Forecasting: A Residual Modeling Approach with Cost Optimization 717
Mohammad Yaghmaee, Adam Walker, Matei Banica, Ray Cheung, Alberto LeonGarcia

Accurate Fuel Level Estimation in Automotive Systems through Machine Learning 725
Rafael Santos Dominguez, Fabio Haremza, Leandro Silva, Andres Velasquez, Max Mauro Dias Santos

Deep Spectrum Sensing Under Realistic RF Conditions: A Cross-Dataset Study 733
Atik Mahabub, Mouna Djellouli, Shervin Vakili

Evaluating AP Measures from EVestG as Markers of Gamma tACS Response in Alzheimer's Disease 739
Omid Ehsani, Brian Lithgow, Zahra Moussavi

The Novel High Bandwidth DDR4 Memory FPGA-Based Design for High-Speed Applications 744
Karim Shahbazi, Willie Tsui

Data Scarcity in Gas Load Profiling: Generalized Proxy-Guided Load and Temporal Disaggregation 750
Lucas Krome, Mahtab Aboufazeli, Soosan Beheshti, Bala Venkatesh

Multi-Modal Robot Path Planning for Complex Outdoor Terrain 756
Aidan Barber, Scott Nokleby

Impact of Clock Gating on IC Delay Testing: Experimental Results 762
Claude Thibeault, Sara Dabbebi

Smart-Scheduled Hybrid EKF–FGO State Estimation 769
Eric Levy, Soosan Beheshti

Hyperspectral Land-Sea-Cloud Segmentation for Onboard Processing via Spectral Band Selection 775
Carlos A. Salazar Sánchez, Jesus D. Gonzalez-Llorente

Optimal Sizing and Operation of Multi-Service Energy Storage Systems 781
Camilo Enrique Ducuara Ramirez, François Bouffard

Proposed Assessment of the Application Development Workflow of the 4-Workflow Model for Secure Agile Practice 787
Peyman Derafshkavian, Serguei Mokhov, Joey Paquet

SCST-Based Advantage Exploitation for Captioning: An Application in Traffic Scene Understanding 794
Danial Sadrian Zadeh, Behzad Moshiri, Otman A. Basir

Federated Autoencoder-Based RFFI for Impersonation Detection in Heterogeneous Wi-Fi Networks 802
Xinyi Li, Samer Lahoud, Nur Zincir-Heywood

A Comparative Evaluation of Object Detection Models for Workstation Recognition in Architectural Floorplans 808
Matthew Allman, Haibin Zhu

Project AURA: Vision-Controlled IoT-Enabled 3D-Printed Robotic Arm 816
Gursahib Singh, Deepansh Sharma, Yassh Singh, Noori Arora, Vansh Sethi, Anthony Aighobahi

EEG-Based Detection of Alzheimer's Disease and Frontotemporal Dementia Using Transformer Networks 822
Nafisa Binte Ghulam Kibria, Nafisa Nawal Moumita, Rifah Ramisa Ferdous, Farzana Tabassum

Digital Twin of a Brushless Doubly Fed Induction Machine Using Graph Neural Network Surrogates 828
Moulay Abdallah Cherif Louazani, Javad Fattahi

A Data-Driven Surrogate Modelling Framework for Grid-Connected Hybrid Renewable Energy Systems Using Dynamic Simulation 834
Kory Melchior, Hamed Aly

Decarbonization of Electric and Transport Systems in Islanded Remote Communities Using Renewable Energy and Mobile Battery Storage System 840
Ahmed Abd Elaziz Elsayed, Waheeb Khan, Shivam Saxena, Hany E.Z. Farag

Development of a Deep Learning–Based Image Analysis System Using EfficientNet-B0 for Early Detection of Corn Leaf Diseases 845
Cherry D. Casuat, Arvin R. De La Cruz, Pedrito Tenerife, Joshua Benjamin Rodriguez, Jan Reuelle Teña Policarpio Tena

SCT-5GC: Self-Conditioned Transformer for Mobile Core Network Telemetry Anomaly Detection 851
Ali Issa, Nahi Kandil, Nadir Hakem

Multi-Frequency Multi-Cell Machine Learning-Based Signal Propagation Modeling in a 5G/4G/3G/2G Cellular Communications Network 859
Ashraf Tahat, Talal A. Edwan

Dynamic Equivalencing of WECC Induction Motors A–C via a Unified Induction Motor–ZIP Model 865
Tohid Rahimi, Sakib Shahriar Joy, Julian L Cardenas Barrera, Eugene Frederick Samuel Hill

Dynamic Modeling and Control of a Robot Balancing on Slackline 871
Tan Sy Nguyen

Evaluating the Security Posture of Canadian Government Authority Websites 880
Isaac Latta, Sina Keshvadi

An LCL-LCC Trap Filter for a Single-phase Grid-connected Inverter 887
Hassan Athab Hassan, Shuang Xu, Liuchen Chang

A Short History of the IEC 61499 Standard for Industrial Process Measurement and Control 893
Robert W Brennan

Detecting ADHD Related Markers in Reddit Posts Using Hierarchical Transformers 899
Brett Lyle, Artemy Gavrilov, Pedro Paiva, Mariana Bento

Modeling and Experimental Validation of Rain Permittivity for Automotive Radar 904
Wafa Farah, Chan-Wang Park

Radial Electrode Geometries for Enhanced Performance in Organic Field-Effect Transistors 908
Mohd Farhan Arshi, Tiago Carneiro Gomes, Matthew Zojac-Rivest, Pavithra Munirathinam, Souvik Bag Hayden Staples, Jonathan Chippet, Simon Rondeau-Gagné, Arezoo Emadi

Performing Agent Evaluation through ML and Agent Documentation using the E-CARGO model 914
Evan Wells, Haibin Zhu

Artificial Dysarthric Speech Recognition using Acoustic Descriptors and Neural Networks 920
Scarlet Aguero-Terrones, Raman Paranjape

Dynamic Incentive-Based Demand Response for Peer-to-Peer Energy Trading in Local Communities 926
Omid Aghapour, Akhtar Hussain, Innocent Kamwa

Leveraging the MEC to Accelerate TCP in 5G Networks 932
Hala Qadi, Martin Karsten, Samer Al-Kiswany

Fed-Equilibrium Framework for Topological Pareto Control in Robust and Fair Clinical Federated Learning 940
Ting Xu, Henry Leung

Teleoperated Ultrasound Imaging with Confidence Map-based Visual Servoing for Acoustic Coupling Optimization 946
Hoorieh Mazdarani, Carlos Rossa

Wireless Infrastructure On-Demand: A UAV-Based Cell-Free Network with Realistic Environment Conditions 952
Fatma Gamal, Sophie Barr, Shokry Shamseldin, Mahmoud Elsaadany

Trajectory-Based Performance Characterization of Wi-Fi for Outdoor Mobile Robot Teleoperation 958
Kirolos Sedra, Alexander Werner, William Melek, George Shaker

Activation-Guided Rule Evolution in Evolving Fuzzy Predictor for Online Modeling of Nonlinear Dynamic Systems 964
Mohamed Ahwiadi, Wilson Wang

Scalability Analysis of Wi-Fi Broadcast Mechanisms Using Simulation and Hybrid Approaches 972
Kirolos Sedra, George Shaker

Distributed Deep Learning for Decentralized, Bandwidth-limited, Dynamic Networks 978
Sourav Mukherjee, Christian Angel, Francis Ferraro, Tim Oates

Probing and Mitigating Identity Leakage in Audio Deepfake Detection Using Artifact-Centric Learning 986
Yasaman Ahmadiadli, Xiao-Ping Zhang, Naimul Khan

Breaking the Visual Barrier: Accessible UML Activity Diagrams via Deep Learning 993
Dolcy Sareen, Manpreet Kour, Mohamed Saber, Youry Khmelevsky

Algorithmic Trading Data Collection and Transformation Process Automation Using DRI for Machine Learning Modelling 999
Justin Drenka, Helana Jaraiseh, James Midtdal, Kristina Cormier, Brandon Hay, Youry Khmelevsky

Cross-Platform 2D and 3D Way-finding Mobile Application for Navigation in Industrial Buildings and Parking Lots 1005
Kristina Cormier, Dolcy Sareen, Helana Jaraiseh, Justin Drenka, Minami Sato, Youry Khmelevsky

A Cloud Energy Storage Based Energy Management Framework for Energy Internet 1011
Amani Fawaz, Imad Mougharbel, Kamal Al-Haddad, Hadi Y. Kanaan

Dead-Time Aware High-Fidelity Modeling of Dual Active Bridge Converters Interfacing Supercapacitors 1017
Henar Mike O. Canilang, Bowen Fong, Shuai Wang, Ning Zhu, Jiacheng Wang

Mapping Kernel-Level Traces to User Actions: An Interference-Aware, Burst-Driven LQN Modeling Approach for Microservices Performance 1022
Gabriel Seyoum, Gregory Franks

Diffusion-Based Models for 3D Vascular Two-Photon Microscopy Generation 1030
Nadia Badawi, Jaloliddin Rustamov, Nazar Zaki, Rafat Damseh

Comparative Evaluation of Current-Fed and Voltage-Fed PMSM Models for EV Applications 1034
Srishti Songriwal, Animesh Anik, K. Lakshmi Varaha Iyer, Himavarsha Dhulipati, Mohamed Abdulsamad

The Cost of Accuracy: Revisiting Machine Learning and Analytical Tools 1040
R. Albuquerque, S. Racedo, B. Jaumard

Enhanced Sage-Husa Adaptive Kalman Filter for High-Precision Space-Debris Tracking 1048
Keywan Mohammadi, Elham Baladi, Güneş Karabulut Kurt

A Privacy-Aware Federated Learning Framework for Decentralized Intrusion Detection in IoT Networks 1054
Ricardo Manzano S., Marzia Zaman, Darshana Upadhyay, Kshirasagar Naik, Thambirajah Ravichandran Nishith Goel

Confidence-Gated AI Model Selection for Adaptive Intrusion Detection in Smart Grid IoT Systems 1060
Muhusina Ismail, Meera Alalawi, Shamma Alalawi, Nisha Thorakkattu Madathil, Sreeletha Chandran Suhib Bani Melhem, Saed Alrabaee

AXL: Executable Intent for Governed LLM-Based Software Maintenance 1068
Salvatore Vella, Salah Sharieh, Alex Ferworn, Malek Sharieh

Design and Simulation of a Broadband 0.5–5 MHz Ultrasound Probe for Lung Disease Diagnostics and Therapeutic Monitoring 1074
Arife Uzundurukan

Crowd and Preference Aware Indoor Path Planning 1080
Saba Farshbaf, Yasaman Amannejad, Behrouz Far

Disentangled Representation Learning for Membership Inference Defense in Graph Neural Networks 1087
Abdellah Jnaini, Mohammed Amine Koulali

An Empirical Evaluation of Model Compression Techniques for On-Device Human Activity Recognition 1094
Okeoghene Tracy Erivwode, Ahmed Bali, Paula Lago

Explainable Anomaly Clustering via Large Language Models (LLMs): Automated Expert Analysis of Cyber Threats 1100
Dina Nawara, Nourhan Ibrahim, Rasha Kashef

Service-Aware and Distribution-Feasible DSO-to-ISO Bid-Offer Curves using T-D OPF Sweeps 1108
Ali Golriz, Kankar Bhattacharya

Unsupervised Embedding-Based Clustering for Vehicle Detection Refinement in SAR Imagery 1114
Saleh Javadi

Underwater Agent Communication Control with Reinforcement Learning 1119
Jason Mallard, Steven F.T. Porretta

Fusion and Hybrid CNN-BiLSTM Models for Battery State-of-Charge Estimation 1127
Shan Ehsan, Seyed M. Naghibzadeh, Mohammad Hassanzadeh, Majid Ahmadi, Nabih Jaber George P. Pappas

Price-Aware Multi-Objective Optimization of Residential Electric Vehicle Charging in Distribution Networks 1133
Oyakhiome Ereme Ikhajangbe, Shichao Liu, Himavarsha Dhulipati

A Lightweight Hybrid Mamba Transformer for Image Super-Resolution 1139
Chaitanya Rathod, Mohammad Hassanzadeh, Ning Zhang

Parameter-Efficient CT Reconstruction via Deep Graph Laplacian Regularization 1145
Veera Varuni Radhakrishnan, Chinthaka Dinesh, Qurat-Ul-Ain Azim

Multimodal CNN-BiLSTM Fusion Architecture for Intra-Hour PV Power Nowcasting 1152
Ahmed Aly Daoud, Mohammad Hassanzadeh, Ahmed Hamdi Sakr

Graph Neural Networks for Energy Routing Optimization in the Energy Internet: a Supervised Approach 1158
Fayssal Zemmouri, Khadidja Henni, Aissa Henni, Boualem Boukezata, Rabea Dahmani, Lina Abou-Abbas

Optimization of Slot–Pole Combinations for Hairpin-Wound Synchronous Reluctance Motors Using a Gradient-Based Algorithm 1164
Mohamed Abdulsamad, Himavarsha Dhulpati, Hicham Chaoui

Enhancing Mobility in Cellular Networks by Utilizing AI/ML-based Measurement Prediction 1170
Ahmed Elhamy Mostafa, Shahab Hamidi-Rad, Aristeidis Seretis, Oumer Teyeb