

2025 IEEE International Conference on Smart Internet of Things (SmartIoT 2025)

**Sydney, Australia
17-20 November 2025**

IEEE Catalog Number:
ISBN:

CFP25Q24-POD
979-8-3315-5979-3



Copyright © 2025, 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:	CFP25Q24-POD
ISBN (Print-On-Demand):	979-8-3315-5979-3
ISBN (Online):	979-8-3315-5978-6
ISSN:	2770-2669

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

LoRa-Based Indoor Localization: The Role of Bandwidth and Spreading Factor	1
<i>Hakim Adjedjou, Lounis Zerioul, Iness Ahriz, Samuel Garcia, Michel Terré</i>	
An Interactive Visualization Framework for Heuristic-Driven IoT Topology Optimization	8
<i>Ruimeng Cao, Songwei Zhang, Tie Qiu, Bingxian Lu</i>	
Radio Map Interpolation Using Geodesics on Statistical Manifolds	15
<i>Imran Moez Khan, Xuezhi Wang, Bill Moran, Wayne S. T. Rowe</i>	
Evaluating Offloading Strategies in the IoT Continuum: a simulation-based approach	21
<i>Claudio Savaglio, Raffaele Gravina, Antonio Guerrieri, Giancarlo Fortino</i>	
Flexibility-Enhanced Scheduling in Multi-Domain Time-Sensitive Networks	29
<i>Guangzheng Guo, Zhenrui Cao, Shuang Liu, Tie Qiu</i>	
Energy-Aware Load Shifting in SWIPT-Enabled IoT Networks	35
<i>Biagio Boi, Laura Finarelli, Falko Dressler, Christian Esposito, Gianluca Rizzo</i>	
Anonymous Lightweight Device-to-Device Continuous Authentication Protocol for IoT	43
<i>Yaovi Ahadjitse</i>	
High Fidelity Synthetic data with Self Mapped VAE for Intrusion Detection in SDN enabled Heterogeneous 6G Networks	51
<i>Syed Hussain Ali Kazmi, Kashif Nisar, Faizan Qamar, Rosilah Hassan, Bahman Javadi</i>	
Direct-to-Cell Access for IoT Communications: A Blockchain-Assisted Approach	59
<i>Zixin Wang, Zongyuan Song, Haoyang Li, Bin Cao, Mugen Peng</i>	
Secure Medical Image Encryption via Dual-Channel Strategy and Digital Signature Verification	65
<i>Zixuan Qiao, Suxuan Yao, Yutong Xie, Xiaoqiang Zhu, Yingying Yao</i>	
MambaGuard: A Hybrid Framework for Unsupervised Anomaly Detection in IIoT Networks	73
<i>Feng Xiong, Aniket Mahanti, Ni Ding</i>	
SMMEG-IoT: A Secure Multi-app Multi-protocol Edge Gateway for the IoT	81
<i>Abdulkadir Dauda, Olivier Flauzac, Florent Nolot</i>	
TLBO-HHO AoI-Aware Task Offloading for Mobile Edge Computing	88
<i>Jie Bai, Haoru Su, Jing Bi, Li Zhang, Xiaoming Yuan, Xiliang Liu</i>	
An Analysis of the Impact of Network Conditions on Edge Federated Learning	96
<i>Imran Zahid, Guilherme Da Cunha Rodrigues, Bahman Javadi, Rodrigo N. Calheiros</i>	
Multi-Agent Deep Reinforcement Learning Based Offloading Strategies and Collaborative Optimization for Computing Power Networks	103
<i>Ruiqi Zhang, Caixing Shao, Ran Li, Qilin Zhang, Jianhua He</i>	
IoMT Patient Monitoring with Blockchain and Fog Computing: A Secure and Efficient Architecture	109
<i>Yunhao Zhao, Aniket Mahanti, Ranesh Naha, Sudheer Kumar Battula</i>	
A Link-Reliable Edge Computing Node Placement Strategy for Internet of Underwater Things	117
<i>Zhao Zhao, Jiuxing Zhang, Wenwei Li, Chao Bu, Zening Zhao, Kai Shi</i>	

MicroIntent: Intent-Based Placement Strategy for Microservice Application in the Compute Continuum Using LLMs	124
<i>Koushikur Islam, Guilherme Da Cunha Rodrigues, Bahman Javadi, Rodrigo N. Calheiros</i>	
A Domain Adaptation Segmentation Network Based on Pyramid Prototypes and Contrastive Learning	132
<i>Wang Siqi, Wu Hao, Wu Chengdong, Yu Xiaosheng, Yu Meiyu</i>	
Validation of Simple Parallel Annealing Algorithm Using Transition-Based Multi-State Spin	138
<i>Kazuma Kanai, Takayuki Kawahara</i>	
Active Color-Aware Demosaicing for Color Polarization Images	146
<i>Junlin Li, Xiangyue Zhang, Hao Wu, Chengdong Wu, Yaoming Zhuang</i>	
From Industrial to Sports Activity Classification via AI of Things Knowledge Adaptation	153
<i>Nazia Akter, Andreea Molnar, Dimitrios Georgakopoulos</i>	
A Novel Hierarchical Integration Method for Efficient Model Merging in Medical LLMs	161
<i>Prakrit Timilsina, Anuj Nepal, Rajan Kadel, Robin Doss</i>	
A Machine Learning Approach for Real-Time Gait Analysis	169
<i>Ankan Ghosh, Sumaiya Afroz Mila, Zongwei Zhen, Cong Chen, Swarup Bhunia, Sandip Ray</i>	
Low-Light Polarized Image Enhancement via Multi-Scale Feature Fusion Network	177
<i>Zhixin Dong, Hao Wu, Xiangyue Zhang, Chengdong Wu</i>	
A Novel Whittle Index-Based Scheduling for Age of Information Minimization in IoT Networks	184
<i>Arian Morteza, Dongyu Qiu, Yousef R. Shayan</i>	
MAFT-Net: Deep Bayesian Filtering for Radar Multi-Agent Formation Tracking	191
<i>Yifu Fu, Bin Rao, Dan Song, Boyu Han, Yiqian Shen, Wei Wang</i>	
Securing Agentic AI in IoT Systems	199
<i>Sandra Kumi, Richard K. Lomotey, Ralph Deters</i>	
Enhancing Real-Time Malicious Traffic Detection in IoT Networks via Image-Based Convolutional Neural Networks: A Scalable Deep Learning Solution for Zero-Day Threats	207
<i>Tai-Ying Chiu, Jiann-Liang Chen, Candra Ahmadi</i>	
A Hybrid Deep-Learning Model for Multi-Class IoT Threat Detection employing Attention-Enhanced CNN-BiLSTM	215
<i>Bipraneel Roy, Hon Cheung, Chun Ruan</i>	
Game-Theoretic AI for Zero Trust Cyber Defense	223
<i>Al Amin Hossain, Darryl Ahner</i>	
Parameters design for vertical section of a 30,000-ton heavy-haul railway alignment based on longitudinal dynamics analysis	231
<i>Qihan Chu, Can Zou, Yiming Zhang</i>	
A Real-Time Internet of Things System for Enhancing Cyclist Safety	237
<i>Kanaka Sai Jagarlamudi, Ashim Kumar Debnath, Arkady Zaslavsky, Wonmongo Lacina Soro Narelle Haworth, Alireza Hassani, Alexey Medvedev</i>	

A Logic-Driven Framework for Home Health Monitoring Using the Matter Protocol and Epistemic Reasoning	247
<i>Viane Matsibekker, Gwendolyn Morgan, James T. Oswald, Thomas M. Ferguson</i>	
Cross-Modality Cooperative Perception for Multiple Vehicles under V2X	256
<i>Tianci Fu, Fengxiang Long, Mengzhen Li, Xiaobo Zhou</i>	
E2E-V2X-CP: An Efficient Cooperative Perception Method for End-To-End Autonomous Driving	263
<i>Jing Zhang, Fengxiang Long, Mengzhen Li, Xiaobo Zhou</i>	
Modernizing Legacy Healthcare Systems Utilizing Semantic-Based Automated Mapping	271
<i>Su-Cheng Haw, Tong-Ern Tai, Wan-Er Kong, Kok-Why Ng, Palanichamy Naveen</i>	
Design and Implementation of a handlebar defect detection system based on machine vision	278
<i>Yirui Gou, Yajun Liu, Yaxuan Yu, Shengkai Guo</i>	
Hamming Distance aware Fault Analysis for LTLBC	286
<i>Yusuke Nozaki, Shu Takemoto, Masaya Yoshikawa</i>	
Resilient Digital Twin Framework for Integrated Anomaly Detection, Classification, and Forensic Analysis in Dynamic Cyber-Physical Systems Under Adversarial Attacks	292
<i>MD Masud Rana, Helen H. Lou</i>	
Low-Latency Power Line Component Detection using Quantized YOLO on Edge Devices	298
<i>Nico Surantha, Hanfei Zhang</i>	
Optimizing Industrial Anomaly Detection with Window-based Sparse Attention	304
<i>Tianyi Xu, Yang Liu, Ziqi Gan, Tie Qiu</i>	
Adaptive Handover Algorithm Based on A-FAHP and Dwell Time Prediction in 5G HetNets	312
<i>Chengbin Huang, Jiahao Zhou, Li Cong, Yang Zhou, Chen Chen</i>	
Energy-Efficient Communication and Localisation Protocol for Industrial IoT Devices	318
<i>Max Amiri, David Eysers, Morteza Biglari-Abhari</i>	
Adaptive Crowd Sensing with Privacy-Preserving WiFi Fingerprinting	326
<i>Rui Neto Marinho, Fernando Brito e Abreu, Tiago Vieira, Miguel Martins</i>	
Federated-Aware Intelligent Mode Selection with Low-Latency Scheduling in Computing Power Networks	334
<i>Yanmin Zhang, Xin Liu, Fengbiao Zan, Tianyi Xu, Tie Qiu</i>	
Refined Faster R-CNN for Enhanced Object Detection in 360-Degree Camera Systems	342
<i>Sagar Shankarrao Dake, Arun Kumar, Narayan Nepal</i>	
Breaking Through Blockchain Scalability Barriers in IoT: A Decoupled Dual-Consensus Approach	347
<i>Mingrui Cao, Bin Cao, Mugen Peng</i>	
DMSformer: Lightweight Transformer-based Model For Multivariate Time Series Forecasting	355
<i>Shotaro Kawano, Takayuki Kawahara</i>	
Evaluation of Visual Adversarial Robustness on Multilingual Large Vision-Language Model	362
<i>Ryo Kumagai, Shu Takemoto, Yusuke Nozaki, Masaya Yoshikawa</i>	
Entropy Regularized Transformer Autoencoder For Anomaly Detection in Multivariate Time Series	369
<i>Mostofa Fahim Hasan, Md Sayem, Md Jahid Hasan, Md Zahangir Alam, Tarem Ahmed</i>	

Enabling Efficient Federated Learning at the Edge through Sparse Forward-Forward Algorithm	376
<i>Ilenia Ficili, Enrico Catalfamo, Fabrizio De Vita, Dario Bruneo, Antonio Puliafito</i>	
Scalable and Robust AI Forecasting of University KPIs Using LSTM and Random Forest within the Lamar Data Lakehouse	384
<i>Ronish Shrestha, MD Masud Rana, Frank Sun, Bo Sun</i>	
Effects of Beacon Spoofing Attacks on Various LoRaWAN Network Devices	389
<i>Jayan Ariyawansa, Rodrigo N. Calheiros, Alana Maurushat, Ala Abdulhakim Al-areqi</i>	
Blockchain Scalability in Healthcare: A Systematic Review of Privacy and Security Considerations	396
<i>Ranjit Kaur, Seyed Shahrestani, Chun Ruan</i>	
Learning-enabled Intrusion Detection in IoT: Current Challenges and Future Directions	404
<i>Safae Naciri, Olivier Gamache, Jacob Ouellet-Boudreault, Adel Abusitta, Martine Bellaiche, Talal Halabi</i>	
EV-CybersecurityClinic: Privacy-Preserving Distributed State Estimation for Electric Vehicles, and Federated Learning for Secure Network Control — Theories, Applications, and Research Roadmap	412
<i>MD Masud Rana</i>	
Improving IoT Cyber Threat Response with Multi-Agent LLMs and Semantic Retrieval	416
<i>James Alan Williams, Sohan Gyawali, Yili Jiang, Jiaqi Huang</i>	
Global-Local Normalization based Model Pool for Online Anomaly Detection in IIoT	422
<i>Yuanzhe Liu, Yang Liu, Cunyu Zhang, Yaotian Dong, Shuxin Ma, Longfei Zhang, Yang Yang</i>	
IAM-based Zero Trust Architecture for IoT: Securing Non-Human Identities in a Connected World	428
<i>Sthembile Mthethwa, Edgar Jembere, Moses Dlamini</i>	
An IoT-Enabled Remote-Controlled Oil Skimming Boat Using LoRa Communication for Real-Time Environmental Monitoring	436
<i>Shameer Ahmed, Fraz Ahmad, Younus Ahamad Shaik, Fahiza Fauz, Dilbar Hussain, Pankaj Yadav Hammad Maqsood, Raja Atta Ur Rehman</i>	
FLOPs-based Lightweight Latency Estimation for Edge AI Inference on Raspberry Pi Devices	443
<i>Kang Bok Seo, Eung Hyup Kim, Ho Min Kang, Soon Ju Kang</i>	
Quantum Meta-Learning for Adaptive Task Offloading in Dynamic Edge Computing Networks	447
<i>Hoa Tran-Dang, Dong-Seong Kim</i>	
Development of AI-ML based models for predicting prices of agri-horticulture commodities such as pulses and vegetable	452
<i>Jayapradha J, Su-Cheng Haw, Ganga Hemanth, Teja D, T. Senthil Kumar</i>	
Does Interactive AI-Enhanced Learning Increase Study Time: A Large-Scale Longitudinal Survey of Japanese Junior and Senior High School Students	457
<i>Shiroh Ohno</i>	
AI-Driven Real-Time Adaptive Camouflage System	462
<i>Sajad Ghatrehssamani, Dylan Moore, Shuvashis Saha, Lawrence Ong</i>	
Efficient Gesture Recognition Using Simplified and Quantized CNN Architecture	464
<i>Bong-seok Kim, Soon Kwon, Sangdong Kim</i>	

Performance Comparison of Attention Module in YOLO-based Vehicle Detection Network with a Super-resolution Branch	466
<i>Hyunjin Jo, Byung Wook Kim</i>	
Convolutional Neural Network-Based Intelligent Waste Classification for Smart City	468
<i>Shengjie Li, Jiancheng Chi, Lei Wang, Van Cu Pham</i>	