2026 International Conference on Embedded Systems, Mobile Communication and Computing (EMC^2 2026)

Hong Kong, China
12-14 January 2026

IEEE Catalog Number: CFP266AY-POD
ISBN: 979-8-3315-7709-4

Copyright © 2026 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: CFP266AY-POD
ISBN (Print-On-Demand): 979-8-3315-7709-4
ISBN (Online): 979-8-3315-7708-7

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

● Chapter 1-Communication, Network and Intelligent Algorithms

Digital Predistortion Method with Two-Dimensional Complex-Valued Spline-Interpolated Lookup Table for Joint Impairment Compensation 1
Tianfu Cai, Jianzhuang Li,Mingyu Li, Shuman Kong

Energy-Efficient Channel Knowledge Map Construction for 6G Networks Using Improved Transformer 6
Kaibo Zhang, Weizheng Zhang, Chiya Zhang

Base Station Switch-Off Strategy for Energy-Efficient Beyond 5G Wireless Networks 12
Chongyao Tang

Optimizing Coding Strategies for BB84-Based Quantum Key Distribution 18
Shawn A. Prestridge, Dinesh Rajan

Direct Preference Optimization toward Mobile and Edge Acceleration: A Survey 24
Yubing Wu, Delu Zeng

HA-DAGP: A Hierarchical Attention-Driven Adaptive Graph Partitioning Model 28
Caidie Li, Xiong Zhang, Jing Sun, Fang Hu

From Data Freshness to Model Updates: An AoI-Driven Client Scheduling Approach 35
Qiran Chen, Wen Chen

A Multi-Strategy Beluga Whale Optimization Algorithm: Design, Implementation, and Performance Analysis 41
Yiwen Jiang, Dongxu Xia, Yixuan Sun, Guoqing Lu

Dual-Agent Reinforcement Learning for Green Permutation Flow Shop Scheduling with Variable Machine Speeds 47
Yongxin Lu, Yiping Yuan, Zirui Li, Yujia Song, Adilanmu Sitahong, Peiyin Mo

LHBKM: Lightweight Hierarchical Blockchain-Based Key Management in Dynamic MEC-Enabled IoT Networks 57
Taufik Iqbal Ramdhani, Ruki Harwahyu, Riri Fitri Sari

A Multi-Residual Network Interaction-Based Method for Optimizing Waveform in Multi-Platform Collaborative Detection 64
Jiahui Tang, Jindong Zhang, Hao Liu, Mingjie Li

A Scalable Edge Server Deployment Strategy Based on Spectral Clustering and Deep Reinforcement Learning 73
Yijing Xiang, Xia Ou, Hongbing Cheng

LGBM-Based Optimal Solution for Data-Driven Transmitter Circuit Design: Prediction Performance and Efficiency Balance 77
Xiaoli Pei

Research on MAC Layer Protocols for VANET Based on Time Slot Improvement 83
Yubing Lin, Fan Yang

CRC-Aided Segmented Sphere Decoding for Polar Codes 88
Yanfeng Li, Wenluo Xian, Xiangcheng Li, Youming Sun, Xiuyu Yue, Haiqiang Chen

DyRRS: A Learning-based Dynamic Retrieval and Routing Optimization Scheme for Edge–Cloud RAG 97
Jiayi Song, Hua Sun, Wenjing Xiao
CondenseGraph: Communication-Efficient Distributed GNN Training via On-the-Fly Graph Condensation 101
Zizhao Zhang, Yihan Xue, Haotian Zhu, Sijia Li, Zhijun Wang, Yujie Xiao
Who's nearby? LBSD user discovery overview 107
Ruiting Liu, Hangyu Li, Bing Zhang
Fairness Driven 3D Trajectory Design and Resource Allocation for UAV-Assisted ISAC Systems 112
Lulu Jing, Hai Wang, Zhen Qin, Yicheng Zhao
Optimization Algorithm for Wireless Communication Spectrum Sensing Based on Deep Learning 122
Xuchen Sun
Performance Comparison of Alamouti Coding, ZF and MMSE Detection over Rayleigh Fading Channels 127
Mandan Dong

● Chapter 2-Embedded Systems and AI Applications

Affine quantized convolutional neural networks in residue number systems 133
Michael Zingerenko, Elena Limonova, Vladimir V. Arlazarov
MAULF: A Multiscale-fused and Attention-guided Unsupervised Learning Framework 140
Junyang Leng, Meng Zhang, Hongci Chen, Fang Hu
Dual Adaptive Feature Modulation for Image Super-Resolution 146
Wenxuan Zhang, Yuhao Jiang, Yican Liu, Junmei Yang, Delu Zeng, Tiewen Pan
Real-Time Statistical Inference and Explainable Generative Modeling for Brain Signals in Mobile and Edge AI Systems 151
Zhiqi Lin, Wei Chen, Delu Zeng, Min Chen
An Image Recognition Method Based on Multi-Scale Wavelet Transform Convolution and Convolutional Block Attention 155
Yuhan Zhu
A Wireless Camera Scheduling Framework for Low-Latency 3D Reconstruction 163
Hongrui Yu, Yihan Sun, Changyang She, Bohai Li, Qian Wang, Syed Ali Hassan, Qiang Wang, Jie Chen
A Cross-Scale Approach to Safety Evaluation in Intelligent Driving 170
Tianyue Liu, Binghui Guo, Ziqiao Yin
Unsupervised Visible-Infrared Person Re-Identification via Fine-Grained Feature-Assisted Cross-Modality Alignment 176
Zhiyong Li, Wei Jiang
Dynamic Adaptation-Based Multi-Agent Emotional Regulation Mechanism in Public Opinion 182
Qinglan Wei, Neng Rao, Xuebing Wen, Hongjiang Xiao
GraphRCA-Chorus: Choreographed Multi-Agent Graph Transformers for Root Cause Analysis in Microservices 186
Jialei Fu, Zeyu Wang, Peiqing Lu, Kejian Tong

Global-Local Collaborative Learning: A Dynamic and Attentive Framework for Tiny Object Detection in Aerial Imagery 193
Yixin Li, Longdi Feng
From Perception to Action: A Foundation-Model- Driven Deep Learning Paradigm for Embodied Intelligence 199
Xiang Ma, Linlin Zhao, You Huang, Liyuan Zhang
Automatic Identification of Discourse Strategies in Customer-Service Human–Agent Dialogues with Explainable Pragmatics-Aware NLP 203
Yuejun Li, Hui Chen
How Does the Public Imagine Technology? Platform-Shaped Discourse Disparities in AIGC 208
Keqing Deng, Xiaokun Wu
Robust Image Classification Based on Transfer Learning: Scale Consistency Regularization 218
Pengyang Liu
Long-Horizon Set Prediction for Multi-Object Tracking via Temporal Instance Queries 223
Haokun Zhang
IoT Intrusion Detection Based on Information Entropy with CNN-LSTM-Attention 232
Yuhao Zhu
MCL-RPL: Multi-view Contrastive Learning for Robust Social Recommendation in Mobile Computing Environments 238
Wei Hu, Juhua Pu, Xiaolan Tang, Xingwu Liu
Similarity Consistency Learning Hashing for cross-modal retrieval 245
Renwei Xia, Yuting Hou, Peng Liu
Cross-Node Co-Design of Generative Distillation for Privacy-Preserving Embedded Edge Computing 249
Xueyao Li, Bei Li
An Edge-Guided Robust Image Watermarking Resistant to Screen-Shooting Attacks 254
Jingyi Zhang, Zhenzhen Zhang, Zichen Li
A Segmentation-Based Bias Field Correction Network 260
Yan Xu, Shunbo Hu, Jianyuan Sun
An Acceleration Sequence Event Detection Method Based on Sliding Window Variance and Lightweight LSTM 265
Shoufeng Chen, Jing Ding, Yifei Zhang, Feng Ou
Optimized Multimodal Diffusion Transformer Architecture for Real-Time Semantic Control of Digital Human Micro-Expressions in Embedded AI Systems 271
Hanwen Wang, Gaojing Zhang
An Intelligent Digital Clock Calibration Method Based on Computer Time Synchronization and Error Compensation 277
Yitian Sun
PocketKD: Adaptive Confidence Distillation and Lightweight Student Network for Embedded Applications 282
Minda Wu
Light-Neck: Memory-Aware Feature Fusion for Real-Time Object Detection on Edge Devices 287
Changyan Liu

High-capacity implicit embedding and lossless traceable image methods for quality information in intelligent manufacturing 292
Hesong Hu, Hang Chen, Chunlin Liu, Shengfang Qiao, Xiaoting Chen, Chun Shan, Mianjie Li
Cluster-Aware Contrastive Learning Framework for Graph Embedding 296
Yanqing Xu, Yangbangyan Jiang
Autonomous Learning through Self-Driven Exploration and Knowledge Structuring for Open-World Intelligent Agents 301
Feiyang Wang, Yumeng Ma, Tian Guan, Yutong Wang, Jinyu Chen
Graph-Structured Deep Learning Framework for Multi-task Contention Identification with High-dimensional Metrics 307
Xiao Yang, Yinan Ni, Yuqi Tang, Zhimin Qiu, Chen Wang, Tingzhou Yuan
Deep Learning-Based Uncertainty-Driven Robust Time Series Forecasting for Backend Service Metrics 312
Sijia Li, Chengda Xu, Chi Zhang, Bolin Chen, Zizhao Zhang, Zixiao Huang
Semantic Alignment and Output Constrained Generation for Reliable LLM-based Classification 317
Jixiao Yang, Sebastian Sun, Yang Wang, Yutong Wang, Xikai Yang, Chi Zhang
A lightweight algorithm for detecting traffic signs 323
Jianhui Zhang
DHMCNN-RV1: A Deep Hybrid Morphological–Convolutional Network with Morphological Residual Enhancement for Infrared Small-UAV Detection 327
Yifan Bu

- **Chapter 3-Sensing, Localization and Control**

Multi-waveguide indoor positioning for PASS 333
Yaoyu Zhang, Xin Sun, Tianwei Hou, Jun Wang, Anna Li, Yuanwei Liu, Arumugam Nallanathan
Underwater Terrain Sensing Method Using Forward-looking Sonar: Embedded System Design and Experimental Validation 340
Weilu Liu, Zhanxi Wu, Tian Zhou, Qijia Guo, Chao Xu
Research on Sensing and Positioning Technology Based on Integrated Sensing and Communication for 6G 346
Mingfei Wang, Xiuying Yang, Weiguang Tian, Jiahui Mi
A method for predicting electrolytic aluminum temperature based on machine learning and federated learning 352
Junyi Yu, Jiajia Xu
Real-World IMU-Wi-Fi Fusion for Indoor Localization Using Deep Learning and Scale-Factor-Adaptive Kalman Filter 357
Yuzhuo Kong, Changyang She, Xing Wei, Yi Zhong, Syed Ali Hassan
A new type of unmanned water quality detection boat based on a 32-bit ARM architecture platform 364
Xuetao Lian, Shenqi Lin, Zongze Yang, Xue Yang, Guangya Lou, Kaihong Shen, Zhanghua Wang, Deliang Xiao, Yutao Yuan, Xujun Hu
Plastic-YOLO: A Super-Resolution Enhanced Detection Framework for Riverine Plastic Waste Using an Optimized YOLOv11 Network 372
Zunyu Liu, Liji Zhan, Qian Qiao, Xiaoyu Zhang

STCP: A novel method for Efficient Motion Planning in Dynamic Environments 376
Ning Yu, Kailin Dong, Hongwei Zhao
Carbon Emission Prediction for Tobacco Logistics Parks Based on CNN-LSTM Model 380
Jiaying Wu, Sen Bai, Guibin Cen, Taicheng Wei, Yuqin Xie
High-Performance Series Elastic Actuator Design and Reinforcement Learning Control Based on the DDPG Algorithm 386
Xiubo Xia, Yongling Fu, Jian Sun, Donghao Jia, Junhang Liu
Detection and Trajectory Planning for Automatic Solar Panel Cleaning Using Drones 391
Haoran Cui, Yanbing Yang, Yang Chen, Jiahuan Cui
Position control based on induction motor with FOC 397
Shuliang Chen, Fangting Zhao
Research on the CCD-YOLOv5 Algorithm for Insulator Defect Detection 402
Gang Wang, Dengshuai Li, Qianjun Ma, Guohui Zhao
Multimodal Sensor Fusion-Assisted EKF and Machine Learning for UAV Positioning 407
Lingche Chi
Trajectory-Tracking for Elbow Joint Robot Based on Riccati Equation and Iterative Learning Control 413
Jinmiao Zhao, Hao Ding, Lu Song, Xin Gong, Xiaoxia Luo, Yiye Li, Erzhe Cheng, Da Xu, Yihan Ma, Wanying Gan
Interpretable Long-Term Methane Concentration Prediction via Transformer Architectures and SHAP Analysis 418
Jinhong Lai
Disturbance decoupling of large-scale Boolean networks based on matrix approach 424
Juhan Li, Peilian Guo, Yuanhua Wang
Efficient Model Predictive Control for 4-D Flight Trajectory Tracking Using Particle Filtering-Based Bayesian Recurrent Neural Network 428
Yuhang Wang, Jingyao Zhang, Peng Zhao, Kaiquan Cai
Kinematic DP-Assisted A* Search for Wear-Constrained Sequential Candidate Selection in Joint Space 433
Zhe Zhang, Bohuan Li, Wenjing Xiao, Xiangsuo Fan, Yixue Hao, Long Hu
High-precision Real-time Angle Measurement Based on TMR Magnetic Sensors 437
Tianxu Xie, Zhuolun Cai, Chuan Yang, Yan Li, Wei Gong, Yong Wang
High-Precision Positioning Based on Neural Network Iterative Learning Control 442
Yuyang Gao
Author Index 447