2026 IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and IEEE International Conference on Robotics, Automation and Mechatronics (RAM)

Changchun, China
5-8 August 2026

IEEE Catalog Number: CFP26835-POD
ISBN: 979-8-3195-2189-7

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:	CFP26835-POD
ISBN (Print-On-Demand):	979-8-3195-2189-7
ISBN (Online):	979-8-3195-2188-0
ISSN:	2326-8123

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

FogTrack: Vision-Language Inheritance Learning for Aerial Multi-Vessel Tracking 1
Changhong Fu, Zijie Zhang, Mengyuan Li, Liangliang Yao, Haobo Zuo, Guangze Zheng, Shan An

Event-Triggered Reference Governor with Deep RL for Constrained Quadrotor UAV Control 9
Rong Wang, Xun Gong

An Approximation-Free Approach to Oxygen Excess Ratio Control of PEM Fuel Cells* 11
Yu Wan, Yan Ma, Jinwu Gao, Hong Chen

Democratizing Physical Intelligence: Interactive Robot Learning Demonstrations for Public Education at Science Centre Singapore 17
Ciel T. Choo, Mei Yeen See, Song Choon Lee, Timothy Lee, Ruixiang Du, Yanliang Zhang, Mun See Tham

A Few-Shot VLM-Driven Perception-to-Action Pipeline for Robotic Pick-and-Place 23
Sixiong You, Jie Xue, John N Tunell, Gabriel Dutra Diniz Costa, Xiaoran Hao, Jian Wang, Guodong Liu

A Coupled Geometric-Mechanical Modeling Approach for Precise Control of Cable-Driven Hyper-redundant Robots 29
Zhenpu Zhu, Zhanxuan Peng, Jiaxun He, Yu Rong, Guoying Gu

Trajectory Tracking Control of Intelligent Vehicles Based on the Unitire Model 37
Fei Wang, Dang Lu

A Real-time Evacuation Strategy Generation Framework for Metro Stations via Simulation-in-the-loop Large Language Model Learning 43
Huibo Bi, Linxuan Wang, Guangpeng Wang, Yuxuan Si, Zhiyao Liang, Yongxing Li, Yanyan Chen, Siqi Wu Yiping Duan, Xiaoming Tao

Phase-Preserving Learned Compression for SAR RAW Data via Complex-Valued Neural Networks 49
Tie Li, Hao Wei, Xin Qiao, Chenyang Ge

Redundancy-Aware Graph Clustering Guided Framework for Swarm Intelligence Feature Selection 55
Yinyin Bao, Ye Lei, Erchao Li, Liangming Chen, Lisen Wei, Wenna Zhao

Teacher-Guided Asymmetric Reinforcement Learning for End-to-End Visual Navigation of UAVs 61
Yiming Wei, Qiuquan Guo, Caizheng Wang, Dengyuan Zhang, Xiaocheng Lin, Xiangkun He

GeoKDS^4:Geometry-Aware Distillation for Semi-Supervised Semantic Segmentation 67
Shun Zuo

A Simple and Lightweight 4-Channel Fusion Strategy for Audio-Visual Speaker Localization with Directional Prior 73
Shimin Ou, Xiangting Chen

CAR-TransReID: Confusion-Aware and Reliability-Guided Learning for Robust Person Re-Identification 79
Jin Liu, Lei Yao, Weinan Hong, Yuanqian Ma, Zipei Fan

EMA-TransUNet: An Enhanced Multi-Scale Attention Network for 3D Nasopharyngeal Carcinoma Segmentation 85
WenBin Zhao, Liang Zhiying, Li Haojiang, Syed Mansoor Sarwar, Xiaoqi Chen, Shen Jun

DFBNet: Decoupled Foreground-Background Collaborative Segmentation for Low-Light Robotic Garment Grasping 91
Yinghao Lv

Sparsity-Aware Vision Transformer Network for Efficient Event-Based Action Recognition 97
Bochen Xie, Jian Liu, Youxuan Fang, Youfu Li

Stackelberg-Based Dual-Policy Learning for Social Robot Navigation* 103
Hui Li, Haoxin Wang, Zhiyu Jiang, Jianan Li, Haokai Jin, Hao Li

Degradation-Aware Perceptual Path Planning for Robust LiDAR Localization* 109
Hui Li, Hao Li, Zhiyu Jiang, Jianan Li, Haokai Jin, Haoxin Wang

Mean Field Game-based Speed Optimization for Large-population CAVs 115
Fuguo Xu, Tielong Shen

End-to-End Jumping Control for a Parallel Wheel-legged Lunar Rover in Low Gravity 120
Yunshu Xue, Houhua Jing, Guanghui Sun

ESO-Enhanced Hierarchical Trajectory Tracking Control for Autonomous Agricultural Vehicle 126
Qiushi Li, Jinlin Sun, Shihong Ding, Zhenzhen Huang

Constrained Distributed Aggregative Optimization With Aperiodic Communication for Networked Multi-Electrolyzer Systems 132
Jiajun Zhang, Runzi Lin, Haifeng Zhang, Jinwu Gao, Shengyan Hou, Shihui Liu

sEMG-Only Interaction Stiffness Estimation for Contact-Rich Human-Robot Collaboration 138
Chan Xu, Silu Chen, Dehao Wang, Xiyu Chen, Chi Zhang, Guilin Yang, Zaojun Fang

TopoFlatten: Action Decision via Topology-Guided Confidence Scoring for Robotic Garment Unfolding 144
Qingyun Yang

Enhancing Spatial Understanding in Vision-Language Models via Curriculum Learning 150
Zhe Zhong, Qinyuan Ren

Cooperative Grasping Strategy for Dual-Drive Gantry Robots with Coaxial Dual-Gripper 156
Jiaxiang Lu, Silu Chen, Chi Zhang, Guilin Yang

Reinforcement learning-based prescribed performance tracking control for robotic manipulators* 162
Yan Li, Xin Liu, Yan Zhang, Jianlei Fan, Zengpeng Lu

An Outcome-Oriented Multimodal Decision Support Framework for Three-Level Emergency Department Triage 168
Siyang Yao, Xing Gao, Yushun Tao, Jing Xiong

A Cooperative Game-Based Approach for Coupled Fault Identification of Unmanned Aerial Vehicles 174
Ping Huang, Chao Cheng, Fantuo Meng, Hualiang Li

Highway Ramp Merging Behavior of Autonomous Vehicles Using Human-Inspired Structured LSTM with Reward Machine Reinforcement Learning 181
Yiyan Lv, Chufei Yan, Zhihao Cui, Yulei Wang

Temperature Anomaly Detection and Early Warning Method for Wind Turbines Based on Multivariate Time-Series Representation Learning 187
Xiaodong Wang, Baoming Wu, Xiangwen Shao, Yintao Fu, Shuanhong Wang

Cascade Control and Virtual Impedance Design for Hardware-in-the-Loop Simulation of Scaled Tracked Vehicles 193
Jingshi Liang, Ye Zhuang, Bin Xu

LLM-in-the-Loop Variable Impedance Control: Towards Safe Generalized and Personalized Robotic Interactions 195
Junyuan Xue, Wenyu Liang, Yilan Xu, Yan Wu, Tong Heng Lee

Tactile-Reactive Surface Following Control on Rapidly Changing or Discontinuous Geometries 201
Yilan Xu, Junyuan Xue, Dongyu Li, Wenyu Liang, Tong Heng Lee

Multimodal Emotion Recognition Using EEG and ECG: Exploring Cross-Modal Correlations and Feature Fusion Strategies 207
Chenrui Ding, Xinrui Wang, Chuanzhi Su, Mengjie Huang, Rui Yang

Diffusion-Based Reinforcement Learning for Multi-Objective Adaptive Control in Autonomous Car-Following 213
Weiling Ke, Shanghao Li, Daiying Tian, Hao Fang

Elasto-Geometric Calibration of Serial Robots Using Joint Torque Sensing 219
Yaohua Zhou, Xiaocong Li

Terrain-Aware Heuristic for Hybrid A*: Low-Cost Path Planning in Off-Road Environments 225
Kai Wang, Meiling Wang, Zihao Mao, Wenjie Song

Research on Simulated Human-in-the-Loop Reinforcement Learning Methods for Robotic Grasping Oriented to Sample Efficiency Improvement 231
Zihe Wei, Tianxing Zhou, Zichen Zhou

A Multi-Parameter Acquisition and Reproduction Framework for Human Manipulation Based on 6-DOF Bilateral Teleoperation 239
Zhao Wang, Yang Gao, Xu Deng

HydrotheraBots: Integrating Robotics, Artificial Intelligence, and Extended Reality for Hybrid Land-Water Rehabilitation 245
John John Cabibihan, Mizaj Shabil Sha

DR-TSLM: Deictic Reference Resolution via Temporal-Spatial Large Language Model for Human-Robot Interaction 247
Runjia Tan, Shanhe Lou, Lan Yu, Xuesong Tian, Chen Lv

Improved YOLOv8-Based Ground Small Object Perception for UAV 253
Yongjun Yan, Yinyin Cao, Peng Zhang, Xuanjiang Liu, Hongliang Wang, Dawei Pi

Physics-Constrained Deep Residual Learning for Dynamics Modeling of Autonomous Racing Cars 259
Bolin Zhao, Zitong Shan, Xianqi He, Baichuan Lou, Chen Lv

Cross-Domain Cockpit Fusion in Autonomous Vehicles: Intelligent Decision-Making and Comfort Optimization via Large Language Models 265
Yuhao Lan, Zhoudong Yan, Peng Hang

CL-DPL: Continual Learning Method Based on Dynamic Prompts for Driver Distraction Detection 271
Lie Yang, Nan Jin, Jing Li, Yan Yang, Xuanyu Chen, Tingfang Zhang

Serial Cycle-Consistent Video Joint Embedding Predictive Architecture with Phase-Wise Optimization 277
Fei Yan, Chengyu Miao, Zhiyi Yao, Wei Han, Yu Liu, Hetian Guo, Tianlv Huang, Tianshuo Wang, Zipei Fan Xuan Song

DPRF-CLIP:Dual-Path Residual Fusion for Zero-Shot Industrial Anomaly Detection 283
Shuaishi Liu, Tianjiao Ma

Multimodal Sentiment Analysis via Modal Experts and Missing-Modal Prompt Generation 289
Shuaishi Liu, Xuanyu Wu

Variable Impedance Control Method for Upper Limb Rehabilitation Robot Based on Fuzzy Network 295
Zaixiang Pang, Guangjun Liu, Yaxuan Wang Shuang, Shuang Li

A Zeroing Neural Dynamics-Based Predictive Control Algorithm for Manipulator Trajectory Tracking and Obstacle Avoidance 301
Zhishuo Zhang, Shijun Tang, Chong Zhang, Yunfeng Hu

Temporal Cross-Modal Alignment Attack against Perception-Oriented Vision-Language Models for Autonomous Driving 307
Xianglong Chen, Yunfeng Hu, Bin Ma, Bosong Zou

SmartHerd: An IoT-Enabled Deep Representation Learning Framework for UWB Trajectory Clustering of Dairy Cows 313
Lei Yao, Fanrong Kong, Jin Liu, Weinan Hong, Zipei Fan, Lin Lei, XinWei Li

HuMam: Humanoid Motion Control via End-to-End Deep Reinforcement Learning with Mamba 319
Yinuo Wang, Xiaowen Tao, Yunfeng Hu, Yang Liang, Ziyu Song, Haitao Ding, Jinzhao Zhou

End-to-End Autonomous Parking Method Fusing CoViT Visual Encoding and State Transition-Assisted SAC 325
Fengjie Du, Shichun Yang, Bingtao Ren, Chuanye Wang, Yaoguang Cao, Yufan Guo

A Simultaneous Calibration Method for Dual-Arm Robots Based on Optical Trackers 333
Kang Min, Yudong Shi, Hangjie Mo, Xiaojian Li, Xianghong Hu, Shanlin Yang

LLM-Based Hierarchical Control Architecture for Robotic Operation 339
Mingyang Ma

Uncertainty-Resilient Fuzzy Reinforcement Learning for Autonomous Endovascular Navigation of Magnetic Vascular Catheter Robots 345
Zhengyang Li, Ge Fang, Yanding Qin, Jianda Han

Active-Model Compensated Model Predictive Control for Ultrasonic Motors in MRI-Compatible Surgical Robots 351
Ke Xu, Longxin Wang, Ge Fang, Yanding Qin, Hongpeng Wang, Jianda Han

Design and Validation of an MRI-Compatible Puncture Needle with Fiber Bragg Grating Force Sensing for Neurosurgery 357
Longxin Wang, Hongzhe Guo, Ge Fang, Yanding Qin, Hongpeng Wang, Jianda Han

Text-Supervised Semantic Segmentation for User-Specified Robotic Cloth Grasping 363
Zhiwen Tu, Xingyu Zhu, Jiqian Zhang, Runyang Feng, Yixing Gao

A Stable Self-Guided Framework for Semi-Supervised Semantic Segmentation 369
Jiqian Zhang, Yue Yin, Yixing Gao

Defect-Aware Neural Compression for Cable Joint Surface Defect Images 375
Bin Liu, Gen Liu, Yunxia Haoyue, Xuefeng Zhao, Xinyu Zheng, Chenyang Ge

Identification of Nonlinear Dynamic Networks via Integral-Based Sparse Bayesian Learning and Stability Screening 381
Yige Yao, Yaozhong Zheng, Ran Shi, Hai-Tao Zhang

Hybrid Subgraph-Vector Retrieval with Planner-Solver-Critic for Wastewater Treatment Plant Operation and Maintenance Assistance 388
Long Pang, Jeff Ng Man-Po, Tsz-Kin Wong, Kevin Wong Chi Wai, Wenkai Hu, Lijun Zhang

MPPI Cost Function Design for Quadrupedal Locomotion via Hierarchical LLM-CEM Optimization 394
Chuyuan Tao, Hanbo Wu, Fanxin Wang, Haolong Jiang, Zehao Li, Yuefeng Gao

An Underactuated Robot Gripper with Slider Dual-Parallelogram Linkages for Pinching and Scooping in Environmental Constraints 400
Yuxuan Hou, Chunyu Guo, Wenzeng Zhang

An Underactuated Robot Gripper With Double-Slot Linkages for Pinching and Passive Scooping in Environmental Constraints* 405
Chenning Cao, Yuxuan Ye, Zeyu Li, Wenzeng Zhang

DLIRO: Dual-Antenna RTK-Aided LiDAR-Inertial Odometry for Large-Scale Outdoor Localization 411
Zewen Sun, Dongen Li, Zefan Huang, Wuqiang Wang, Christina Dao Wen Lee, Junqi Liu, Chengran Yuan Shuo Sun, Hongliang Guo, Francis E. H. Tay, Marcelo H. Ang

Study on Gimbal Line-of-Sight Stabilization Method Based on Fuzzy Sliding Mode Control 418
Zuyao Zhang, Benfa Zhang, Taoming Hao, Qi Xu, He Wang, Jinan Sun, Yuhang Liu, Yankang Liu

Markov Intent-Driven Shared Control for Teleoperated Needle Puncture 424
Pu Chen, Hao Wen, Haibo Jing, Jiexi Tian, Xingguang Duan, Changsheng Li

Data Driven Impedance Control of Space Robot Capturing a Target with Model Uncertainties 430
Prasad N. Dal, Saurabh Chaudhary, Suril V. Shah

Bio-Inspired Model Predictive Formation Control of Multi-Robot Systems (MRS) under Limited Visibility in a Dynamic Indoor Environment 436
Madan Gopal Tiwari, K Anirudha, Abhra Roy Chowdhury

DIFES: Diffusion-Informed Feature Smoothing for Small-Sample Materials Characterization Imaging 443
Ziyue You, Fu Liu, Qiuzhan Zhou, Shuzhi Sam Ge

A Calibration Method for Serial Robots Based on an Improved Bald Eagle Search Algorithm 445
Wei Zhao, Angang Feng, Hongrui Wu, Yanhui Li, Xin Guo, Mingchao Zhu

A Multi-Sensor Fusion SLAM Method with Ground Constraints for Inspection Robots 451
Xueyu Luo, Longfei Wu, Xiaogang Liu, Shouqiao Xin, Yankang Liu, Taoming Hao, Yue Zhang Qihang Zhang

CA-Safe DP: Integrating Coordinate Attention and Overshoot Recovery for Robotic Manipulation 456
Zhe Wu, Yicheng Shi, Yuanchong Wang, Renjie Cheng, Wenyi Liu, Zongda Zhang

Robust Sheet-Material Identification via Dual-Press Thickness Estimation and Tactile Mixture-of-Experts 462
Zhisan Han, Priscilla Hong, Yuchuan Huang, Xiaoshi Zhang

A Noise-Resilient Discrete-Time Zeroing Dynamics Approach to Equality-Constrained Time-Varying Quadratic Programming 464
Zixuan Cheng, Liang Feng, Zhihan Xu, Chao Jiang, Yang Shi, Jiyun Wang

Appearance-Boundary Fusion Distillation for Event-Based Optical Flow 470
Haoxiang Ma, Haojia Wang, Zhen Yang

Application of CNN-LSTM with Artificial Features and Attention Mechanism for Walking, Upstairs, and Downstairs Recognition 476
Mengyuan Zhou, Meng Zhang, Ge Cao, Linxing Wang, Xiuqi Sun, Jiahe Zhang

Intelligent Driver State Monitoring and Warning System for Long-Haul Freight 482
Yan Yang, Jing Li, Nan Jin, Cheng Zeng, Xianfeng Xiao, Lie Yang

DaSiamRPN Target Tracking Algorithm Based on Shallow Neural Network Model Update 488
Xiaozhen Liang, Pengfei Ren, Yankang Liu, Xiaohong Zhu, Chunzong Lan, Chang Liu, Anan Hong Taoming Hao

Texture-Constrained Diffusion Model for Cable Joint Surface Defect Generation 494
Bin Liu, Yuchen Wang, Sen Teng, Xuefeng Zhao, Xuewei Wei

From Code Generation to Logic Internalization: A Human–AI Collaborative Mechanism for Generative AI- Enabled Programming Instruction 500
Xue Wang, Zhiyuan Hou, Simiao Lang, Zhongwen Yu

Intelligent Scheduling and Orchestration for Generative AI-driven Micro-course Production 506
Simiao Lang, Qian Li, Chunting Zuo, Xue Wang

AeroBridge-TTA: Test-Time Adaptive Language-Conditioned Control for UAVs 512
Lingxue Lyu

AI-Driven Advances in Pulse Adulteration Detection Using Spectroscopy and Hyperspectral Imaging 518
Rashmi Kanyal, Prateek Srivastva, Amit Kumar Mishra, Swati Pant

Predictive Collision Avoidance via Probabilistic Multi-Object Tracking in Dynamic Environments 524
Bruk Gebregziabher, Hadush Hailu

Cable Joint Surface Roughness Measurement Algorithm Based on 3D Models and Displacement Maps 530
Jian Gao, Lei Xin, Shaobin Li, Xuefeng Zhao, Yaning Liu