

# **2024 4th International Conference on Robotics, Automation and Intelligent Control (ICRAIC 2024)**

**Changsha, China  
6-9 December 2024**



**IEEE Catalog Number: CFP24VA1-POD  
ISBN: 979-8-3315-4402-7**

**Copyright © 2024 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:	CFP24VA1-POD
ISBN (Print-On-Demand):	979-8-3315-4402-7
ISBN (Online):	979-8-3315-4401-0

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2024 4th International Conference on Robotics, Automation and Intelligent Control (ICRAIC) **ICRAIC 2024**

## Table of Contents

Preface .....	xix
Conference Committee .....	xx

### ICRAIC 2024

Visual Analysis of Ship Fire Research Based on CiteSpace .....	1
<i>Yaqiang Zuo (Dalian Maritime University, China), Baijun Tian (Dalian Maritime University, China), and Hanyuan Zhang (Dalian Maritime University, China)</i>	
Background Estimation Based on Tensor CUR Decomposition .....	5
<i>Yue He (Nanjing University of Posts and Telecommunications, China), Guoxia Xu (Nanjing University of Posts and Telecommunications, China), Lizhen Deng (Nanjing University of Posts and Telecommunications, China), and Hu Zhu (Nanjing University of Posts and Telecommunications, China)</i>	
Research on Economic Optimal Dispatch of Microgrid Clusters Based on Improved Vulture Optimization Algorithm .....	10
<i>Zhuangzhuang Luo (Hubei Minzu University, China) and Qing Ai (Hubei Minzu University, China)</i>	
Active Fault-Tolerant Thermal Control of Lithium-ion Batteries against Air Cooling Input Fault .....	14
<i>Chengzhi Liu (University of Jinan, China), Zhengce Liu (University of Jinan, China), Zi-Peng Wang (Beijing University of Technology, China), Ping Jiang (University of Jinan, China), and Kezhen Han (University of Jinan, China)</i>	
Design of a Soft Hand Rehabilitation Robot .....	20
<i>Xiaohui Wang (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Qinkun Cheng (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Zhifeng Wang (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), and Naishi Feng (Shenyang University, China)</i>	
Path Planning Algorithm for Mobile Robot Based on Deep Reinforcement Learning .....	25
<i>Zhengen Lv (Guilin University of Technology, China), Yicheng Shen (Guilin University of Technology, China), Ling Hao (Zhejiang University of Technology, China), Yi Lei (Guilin University of Technology, China), and Yibo Wang (Guilin University of Technology, China)</i>	

Enhancing Point Cloud Scene Understanding with a Data-Aware PointNet .....	31
<i>Kai Xiao (National University of Defense Technology, China), Jialin Gui (National University of Defense Technology, China), Jian Long (National University of Defense Technology, China), Xiang Hu (National University of Defense Technology, China), and Yuanxi Peng (National University of Defense Technology, China)</i>	
SOC Estimation for Lithium-ion Batteries Based on BiLSTM-AdaBoost with Savitzky-Golay Filter .....	35
<i>Qinyi Liao (Hubei Minzu University, China), Shidong Li (Hubei Minzu University, China), Xiangjin Yin (Hubei Minzu University, China), and Qiaoqiao Xing (Hubei Minzu University, China)</i>	
Boundary PD Control of an Output Restricted Mobile Manipulator Based on Disturbance Observer .....	42
<i>Fang Guo (Dongguan University of Technology, China), Yi Qin (Dongguan University of Technology, China), and Fujie Wang (Dongguan University of Technology, China)</i>	
Hardware Platform Design of a Pneumatic Soft Hand Rehabilitation Robot .....	46
<i>Xiaohui Wang (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Qinkun Cheng (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Yongxu Lu (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Zhifeng Wang (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), and Naishi Feng (Shenyang University, China)</i>	
A Fast Method for Reconstructing 3D Models of Handheld Objects in Manufacturing Factories Based on Point Clouds .....	52
<i>Yang Li (Norinco Group Air Ammunition Research Institute, China), Lei Liu (Norinco Group Air Ammunition Research Institute, China), Xiaoping Pu (93128 troops of the Chinese Peoples Liberation Army, China), Yuanxun Zheng (Norinco Group Air Ammunition Research Institute, China), Yongliang Guan (Norinco Group Air Ammunition Research Institute, China), Junnan Chen (Norinco Group Air Ammunition Research Institute, China), and Lan Wei (China Research and Development Academy of Machinery Equipment, Beijing)</i>	
Research on Path Planning Simulation of Mobile Robot Based on ROS .....	60
<i>Mingtao Yao (Beijing University of Chemical Technology, China), Chenhao He (Beijing University of Chemical Technology, China), and Jiawei Wang (Beijing University of Chemical Technology, China)</i>	
Time-Frequency Vision Transformer Based on Fault Diagnosis Method for Spacecraft Attitude Control System .....	65
<i>Ting Li (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Sheng Gao (Chinese Academy of Sciences, China; China-Portugal Belt and Road Joint Laboratory on Space &amp; Sea Technology Advanced Research, China), Qinkun Cheng (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Zuwei Liu (Three Gorges Navigation Administration Bureau, China), Chenguang Ai (Chinese Academy of Sciences, China), and Wei Zhang (Chinese Academy of Sciences, China)</i>	
HSSAS: Optimizing NLP Models by Combining Self-Supervised Learning and Neural Architecture Search .....	71
<i>Shuocheng Qi (University of Jinan, China), Dong Wang (University of Jinan, China), Yuling Fan (University of Jinan, China), and Likai Dong (University of Jinan, China)</i>	

A Numerical Modeling and Simulation Approach for the Dynamic Analysis of Non-Contacting Mechanical Face Seals .....	76
<i>Bo Yan (Ningxia University, China; Tsinghua University, China), Qiang He (Tsinghua University, China), Weifeng Huang (Tsinghua University, China), Zhike Peng (Ningxia University, China; Shanghai Jiao Tong University, China), and Songtao Hu (Ningxia University, China; Shanghai Jiao Tong University, China)</i>	
A Enhanced MPF Method for Terrain Aided Loosely Coupled Navigation .....	83
<i>Peng Ding (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), Shenshen Yang (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), Lei Wang (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), and Xiufeng Li (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China)</i>	
A Traffic Intersection Branch Flow Prediction Method Based on Reinforcement Learning .....	88
<i>Jianhua Dong (Chongqing Jiaotong University, China)</i>	
Building Disease Image Recognition Network Based on Improved SRM Attention Mechanisms ..	92
<i>Yanna Liao (Xi'an University of Posts and Telecommunications, China), Zhehui Mi (Xi'an University of Posts and Telecommunications, China), and Sayda Elmi (University of New Haven, USA)</i>	
Research and Design of an Intelligent Strawberry Picking Robot Based on STM32 and Color Sensor Technology .....	99
<i>Xiang Pan (Shanghai Institute of Technology, China), Chun Luo (Shanghai Institute of Technology, China), Yuru Zheng (Shanghai Institute of Technology, China), Zhengyi Hou (Shanghai Institute of Technology, China), and Awen Ma (Shanghai Institute of Technology, China)</i>	
Deep Learning and Machine Vision Based License Plate Detection for Complex Environments ..	103
<i>Mingkun Guo (Harbin Engineering University, China), Yan Li (Shihezi University, China), Jiyong Hu (FAW-Volkswagen Automobile Company, China), and Hongfei Yang (Shihezi University, China)</i>	
Automated Ton Bag Handling System Based on Vision and Laser Localization .....	107
<i>Jun Tang (Hunan Shengshitong Technology Co., Ltd., China), Jiakai Liao (Changsha University of Science &amp; Technology, China), and Tengjiao Long (Hunan Xiangjiang Smart Car Travel Technology Co., Ltd, China)</i>	
An Accurate Online Circular Hole Measurement Method Based on Multi-Camera .....	111
<i>Fangyuan Wang (Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Renbo Xia (Chinese Academy of Sciences, China), Jibin Zhao (Chinese Academy of Sciences, China), Tao Zhang (Chinese Academy of Sciences, China), Liang Zhao (Chinese Academy of Sciences, China), and Tianyu Zhang (Chinese Academy of Sciences, China)</i>	

An Optimized Path Planning Method for Mobile Robots Based on Hybrid A* and DWA Algorithm .....	117
<i>Xuan Zhou (Nanjing Normal University, China), Xuan Lu (Nanjing Normal University, China), Jiaqing Ma (Nanjing Normal University, China), Yijun Li (Nanjing Normal University, China), Lei Ma (Nanjing Wanhe Robot Technology Co., Ltd, China), Fei Xie (Nanjing Normal University, China), and Jing Zhao (Nanjing University of Posts and Telecommunications, China)</i>	
AES Model with Logic Rule Reasoning and Self-Explanation Based on AMR and LLM .....	125
<i>Jiaxing Sun (North China University of Technology, China), Qing Zhang (North China University of Technology, China), Jie Liu (North China University of Technology, China), and Liyuan Zhang (Dalian University of Technology, China)</i>	
Contrastive Learning Graph Collaborative Filtering Model Based on Hybrid Negative Sampling....	130
<i>Jing Zuo (Qinghai Normal University, China; Beijing Normal University, China), Chen Hao Xu (Qinghai Normal University, China; Beijing Normal University, China), Sheng Ling Geng (Qinghai Normal University, China; Beijing Normal University, China), Zhong Ze Luo (Qinghai Normal University, China; Beijing Normal University, China), Yong Jia Jiang (Qinghai Normal University, China; Beijing Normal University, China), and Qi Hang Wei (Qinghai Normal University, China; Beijing Normal University, China)</i>	
Design and Fault Diagnosis of an Aircraft Online Control System .....	137
<i>Jiageng Luo (National key laboratory complex system control and Intelligent agent cooperation, P.R.China)</i>	
Real-Time SVM Classification of EMG Signals for Detecting Finger Movements in Prosthetic and Robotic Arm Control .....	145
<i>Kimia Savoji (Clemson University, USA) and Ata Jahangir Moshayedi (Jiangxi University of Science and Technology, China)</i>	
Leveraging SAM for Training-Free Binocular Disparity Estimation .....	151
<i>Panpan Yuan (University of Science and Technology Liaoning, China; Polytechnic University, China), Zhibin Chen (University of Science and Technology Liaoning, China), Xu Wang (Polytechnic University, China), Kuowen Guang (Polytechnic University, China), Xinzheng Zhu (Polytechnic University, China), Yupeng Du (University of Science and Technology Liaoning, China; Polytechnic University, China), Fengyu Liang (University of Science and Technology Liaoning, China; Polytechnic University, China), and Jinfeng Yang (Polytechnic University, China)</i>	
Adaptive Active Disturbance Rejection Control for Manipulator with Local Dynamic Linearization .....	160
<i>Peng Chen (Control Science and Technology Department in Zhejiang University of Technology, China), Qiang Chen (Control Science and Technology Department in Zhejiang University of Technology, China), Huihui Shi (Control Science and Technology Department in Zhejiang University of Technology, China), and Yimin Zhou (Shenzhen Institute of Advanced Technology in Chinese Academy of Sciences, China)</i>	
Hybrid Artificial Bee Colony Algorithm for Weighted C-Type Random 2 Satisfiability in Discrete Hopfield Neural Network .....	166
<i>Yunjie Chang (Universiti Sains Malaysia, Malaysia; Hunan Institute of Technology, China) and Xiaofeng Jiang (Universiti Sains Malaysia, Malaysia)</i>	

Hopf Bifurcation Control and Finite-Time Synchronization in a 4D Hyperchaotic System .....	170
<i>Yan Zhou (Inner Mongolia Normal University, China), Ruimei Li (Inner Mongolia Normal University, China), and Zhuang Cui (Inner Mongolia Normal University, China)</i>	
A Descriptor with Rotation Invariance of Environment Expression using Building Boundary of OpenStreetMap .....	174
<i>Yuxian Zhang (Shanghai Jiao Tong University, China), Runheng Zuo (Shanghai Jiao Tong University, China), Hao Liu (Beijing Intelligent Transport Development Center, China), Zexing Li (Shanghai Jiao Tong University, China), Ruoyao Li (Shanghai Jiao Tong University, China), and Yafei Wang (Shanghai Jiao Tong University, China)</i>	
Deep Reinforcement Learning-Driven Multi-Agent Collaborative Optimization for Battlefield Kill Chain Efficiency .....	179
<i>Jie Zhang (Nanjing Research Institute of Electronic Engineering, China), Feng Zhu (Nanjing Research Institute of Electronic Engineering, China), Chao Wang (Nanjing Research Institute of Electronic Engineering, China), Dong Li (Nanjing Research Institute of Electronic Engineering, China), Zhiquan Chen (Nanjing Research Institute of Electronic Engineering, China), and Liang Zhang (Nanjing Research Institute of Electronic Engineering, China)</i>	
Non-Visual Semantics-Based Basement Floor Identification and Localization .....	184
<i>Guangxiao Shao (Qingdao University of Science and Technology, China), Wennan Chai (Qingdao University of Science and Technology, China), Wenjian Wang (Qingdao University of Science and Technology, China), Xiaohui Yang (University of Kassel, Germany), and Qingdang Li (Qingdao University of Science and Technology, China)</i>	
Biomimetic Butterfly Robot Based on Flapping Wing Flight of Spotted Butterfly .....	190
<i>Chao Liu (Soochow University, China), Liuyi Shi (Soochow University, China), Zichang Deng (Soochow University, China), Siteng Ma (Soochow University, China), Aidi Zhang (Soochow University, China), and Tangyan Song (Soochow University, China)</i>	
Evaluation of System Capability Based on Optimized Wavelet Neural Network .....	196
<i>Chao Zhang (Military Representative Bureau of the Army Equipment Department in Nanjing Region, China), Dong Li (The 28th Research Institute of China Electronics Technology Group Corporation, China), Yunze Wang (Military Representative Bureau of the Army Equipment Department in Nanjing Region, China), and Aiwei Zang (The 28th Research Institute of China Electronics Technology Group Corporation, China)</i>	
A Gesture Recognition Method Based on Edge-Terminal Collaboration and Transfer Learning .....	201
<i>Chao Wang (Nanjing Research Institute of Electronic Engineering, China), Liang Zhang (Nanjing Research Institute of Electronic Engineering, China), Tao Wang (Nanjing University of Posts and Telecommunications, China), Rui Guo (Nanjing Research Institute of Electronic Engineering, China), and Feng Zhu (Nanjing Research Institute of Electronic Engineering, China)</i>	
Fault Diagnosis of Charging Piles Based on SPCA-ISSA-SVM .....	206
<i>Pangdi Peng (Hubei Minzu University, China), Xianbo Sun (Hubei Minzu University, China), Haoyu Jin (Hubei Minzu University, China), and Kewen Dong (Hubei Minzu University, China)</i>	

Research on Key Technologies for Intelligent Monitoring in Drilling and Extraction .....	212
<i>HaoYu Jin (Hubei Minzu University, China), XianBo Sun (Hubei Minzu University, China), PangDi Peng (Hubei Minzu University, China), and ZhiChao Wang (Hubei Minzu University, China)</i>	
An Integrated System for Visible Light Communication and Gesture Recognition Based on ResNet .....	218
<i>Zehua Xu (Tsinghua University, China) and Hongyan Fu (Tsinghua University, China)</i>	
Research on 3D Modeling of Real Scene of Ancient Timber Structures Based on UAV Tilt Photogrammetry .....	222
<i>Qi Li (Guangxi University of Science and Technology, China), Haibo Xia (Guangxi University of Science and Technology, China), Yanan Ren (Guangxi University of Science and Technology, China), Haotian Ming (Guangxi University of Science and Technology, China), Xiaoyun Yang (Guangxi University of Science and Technology, China), Peng Li (Guangxi University of Science and Technology, China), Yiwei Liu (Guangxi University of Science and Technology, China), and Xiang Liu (Guangxi University of Science and Technology, China)</i>	
Research on Dynamic Construction Method of Command and Control Capability Packages Based on SOA .....	228
<i>Dong Li (The 28th Research Institute of China Electronics Technology Group Corporation, China), Aiwei Zang (The 28th Research Institute of China Electronics Technology Group Corporation, China), Jie Zhang (The 28th Research Institute of China Electronics Technology Group Corporation, China), Chao Wang (The 28th Research Institute of China Electronics Technology Group Corporation, China), and Tianqi Lv (The 28th Research Institute of China Electronics Technology Group Corporation, China)</i>	
MPC and Whole-Body Control-Based Bimanual Mobile Robot Reactive Control .....	233
<i>Jianming Yao (Guangdong University of Technology, China; The Shenzhen Institute of Artificial Intelligence and Robotics for Society, China), Ning Wang (Nanjing University of Aeronautics and Astronautics, China; The Shenzhen Institute of Artificial Intelligence and Robotics for Society, China), Huafeng Dong (Guangdong University of Technology, China), and Tianwei Zhang (The Shenzhen Institute of Artificial Intelligence and Robotics for Society, China)</i>	
Stochastic Consensus for Heterogeneous Multiagent Systems with Multiple Observers via Non-Periodic Sampling Strategies .....	238
<i>Yuanshan Liu (Nanjing Agricultural University, China) and Yize Yang (The University of Adelaide, Australia)</i>	
Multi-Objective Small Gap Coal Gangue Recognition Method Based on Semantic Segmentation ....	245
<i>Yanwei Wang (Heilongjiang University of Science &amp; Technology, China), Yulong Wang (Yichun Luming Mining Co., Ltd, China), Wenbin Tao (Heilongjiang University of Science &amp; Technology, China), Jiaquan Yang (Yichun Luming Mining Co., Ltd, China), and Xiangyu Zhang (Yichun Luming Mining Co., Ltd, China)</i>	



Obstacle Avoidance Trajectory Planning for Truss-Type Coal Gangue Sorting Robot .....	250
<i>Zhenhui Min (Heilongjiang University of Science &amp; Technology, China), Yulong Wang (Yichun Luming Mining Co., Ltd, China), Zheng Wang (Heilongjiang University of Science &amp; Technology, China), Jiaquan Yang (Yichun Luming Mining Co., Ltd, China), Xiangyu Zhang (Yichun Luming Mining Co., Ltd, China), and Yanwei Wang (Heilongjiang University of Science &amp; Technology, China)</i>	
A Vision-Based Autonomous Picking Robot Based on Optimized YOLOv5 with CBAM and ASFF .	255
<i>Lizhi Gong (Nanjing Normal University, China), Ying Wu (Nanjing Normal University, China), Xuan Lu (Nanjing Normal University, China), Ying Lin (Nanjing Normal University, China), Haining Huang (Nanjing Normal University, China), Fei Xie (Nanjing Normal University, China), and Baoping Ma (Nanjing Normal University, China)</i>	
Short-Term Power Load Forecasting Based on FARIMA with Cuckoo Optimization .....	259
<i>Junyi Lin (Minnan University of Science and Technology, China), Suying Wu (Minnan University of Science and Technology, China), Zhengyang Wu (Minnan University of Science and Technology, China), Cheng Cao (HCL Technologies, USA), and Wanqing Song (Minnan University of Science and Technology, China)</i>	
Research on Identification Method of Groove Inflection Point of Medium and Thick Plate Based on Line Structured Light .....	263
<i>Xu Feng (Wuhan University of Technology, China), Hong Lu (Wuhan University of Technology, China), Zhe Zhang (Central Southern China Electric Power Design Institute, China), Yongquan Zhang (Wuhan University of Technology, China), Xujie Yuan (Wuhan University of Technology, China), Jinchao Feng (Wuhan University of Technology, China), and Weijie Dong (Wuhan University of Technology, China)</i>	
Integrated Method for Shaft Bearing Fault Diagnosis Based on VMD Signal Reconstruction and Enhanced YOLOv8 Model .....	270
<i>JiaQi He (Wuhan University of Technology, China), Hong Lu (Wuhan University of Technology, China), Yan Kan (LingYun Technology Group Co., Ltd., China), DaWei Yan (LingYun Technology Group Co., Ltd., China), FangBo Cheng (Wuhan University of Technology, China), Qi Liu (Wuhan University of Technology, China), and ChuanLong Shang (Wuhan University of Technology, China)</i>	
Parkinson's Disease Identification Based on Instantaneous Amplitude Features .....	276
<i>Fangyuan Zheng (Northwest Normal University, China), Yuhong Ma (Northwest Normal University, China), Jinye Lu (Northwest Normal University, China), and Juntao Wang (Northwest Normal University, China)</i>	
Optical Flow Clustering Fusion of Improved Artificial Potential Field Method for Robot Obstacle Avoidance .....	281
<i>Shuai Duan (Liaoning University, China), Lina Li (Liaoning University, China), and Juxian Wu (Liaoning University, China)</i>	

A Kinematic-Constrained Inertial Navigation Method Based on Simplified Sage-Husa Filter ...	288
<i>Peng Ding (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), Shenshen Yang (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), Bohan Liu (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China), and Xiufeng Li (China Ship Scientific Research Center, China; State Key Laboratory of Deepsea Manned Vehicle, China; Taihu Laboratory of Deepsea Technological Science, China)</i>	
Adaptive Synchronization of Stochastic Chaotic Delayed Neural Networks with Discontinuous Activations .....	293
<i>Qian Wang (Tianjin University of Commerce, China), Zhiyi Lu (Tianjin University of Commerce, China), Zi-Peng Wang (Beijing University of Technology, China), Zhijie Liu (University of Science and Technology Beijing, China), and Xiao-Wei Zhang (Beijing University of Technology, China)</i>	
Prescribed Performance Control of Second Order Nonlinear Multiagent Systems with Actuator Faults .....	299
<i>Jiayou Guan (Hebei University of Technology), Shida Xun (Hebei University of Technology), Meng Wang (East China University of Science and Technology), Anqing Wang (Dalian Maritime University), Wenqiang Ji (Hebei University of Technology), and Zhaocheng Wang (Hebei University of Technology)</i>	
Research on Path Tracking of Wheeled Mobile Robot Based on Adaptive Sampling Time MPC	305
<i>Suna Zhao (Zhengzhou University of Light Industry, China), Peijun Han (Zhengzhou University of Light Industry, China), Jie Zhang (Zhengzhou University of Light Industry, China), and Taishan Lou (Zhengzhou University of Light Industry, China)</i>	
FL-SeAu: Federated Learning with Security Authentication via Reversible Data Hiding .....	311
<i>Tingting Su (Engineering University of PAP, China), Yan Ke (Engineering University of PAP, China), Jiajia Weng (Engineering University of PAP, China), and Zhaojun Yu (Engineering University of PAP, China)</i>	
An Optimal Multi-Agent Path Planning Method Based on Priority Setting and Collision Detection .....	320
<i>Long Zhang (Nankai University, China), Haining Zhang (Nankai University, China), Qian Zhang (Nankai University, China), and Yameng Zhao (Nankai University, China)</i>	
Research on Traffic Flow Speed Prediction Model Based on Spatio-Temporal Graph Convolution for Multiple Time Periods .....	327
<i>Fangxuan Li (Tianjin University, China), Kang Song (Tianjin University, China), Hui Xie (Tianjin University, China), and Long Yan (Tianjin University, China)</i>	

A Novel Power Inspection Robot Based on Obstacle Detection Method using YN-Net Deep Neural Network .....	336
<i>Xiaohan Yang (Nanjing Normal University, China), Wenxin Xu (State Grid Jiangsu Electric Power Co., LTD., State Grid Huaian power supply company, China), Baoping Pang (State Grid Jiangsu Electric Power Co., LTD., State Grid Huaian power supply company, China), Jiaqing Ma (Nanjing Normal University, China), Baoping Ma (Nanjing Normal University, China), and Fei Xie (Nanjing Normal University, China)</i>	
An Efficient Image Restoration Method Based on Iterative Attention and Regional Feature Processing .....	344
<i>Xiwen Zhang (Ningbo University, China), Shuaixin Wang (Ningbo University, China), Kewei Chen (Ningbo University, China), and Fangyan Dong (Ningbo University, China)</i>	
A Road Defect Detection Network Based on Attention Mechanism .....	350
<i>Junxian Li (Ningbo University, China), Jiake Wu (Ningbo University, China), Fangyan Dong (Ningbo University, China), and Kewei Chen (Ningbo University, China)</i>	
Elevator Brake Fault Diagnosis Method Based on Active Learning of Temporal Ensembling Gradient Vector .....	356
<i>Jiahao Ma (Southwest Jiaotong University, China), Kai Zhang (Southwest Jiaotong University, China), Dalong Wang (Southwest Jiaotong University, China), Qing Zheng (Southwest Jiaotong University, China), Guofu Ding (Southwest Jiaotong University, China), and Zhaocheng Yuan (Chengdu Institute of Special Equipment Inspection and Testing, China)</i>	
Research on Tomato Maturity Detection Based on YOLOv8s and Attention Mechanism .....	362
<i>Huimei Wei (Dalian University of Science and Technology, China) and Jing Li (Dalian University of Science and Technology, China)</i>	
Control Method of Underwater Manipulator Based on Fusion of Somatosensory and Visual Information .....	368
<i>Zhibo Cui (Xi'an Jiaotong University, China), Mingming Zhang (Xi'an Jiaotong University, China), Shuanglu Quan (Xi'an Jiaotong University, China), Xinquan Xu (Xi'an Jiaotong University, China), Haolin Zhang (Xi'an Jiaotong University, China), Qiao Hu (Xi'an Jiaotong University, China), and Pengfei Xu (Hohai University, China)</i>	
A Collaborative Drone System with Robotic Arm Based on Lightweight Structure and Multimodal Control .....	375
<i>Feng Yang (Nanjing Normal University, China), Qing Yao (Nanjing Normal University, China), Ziwen Song (Nanjing Normal University, China), Haoyuan Gu (Nanjing Normal University, China), Jiaqing Ma (Nanjing Normal University, China), Yiwen Huo (Nanjing Normal University, China), and Yijian Liu (Nanjing Normal University, China)</i>	
Time-Varying Formation Maneuvering Control of Multiple Unmanned Surface Vessels using Affine Formation .....	382
<i>Wen Pang (University of Shanghai for Science and Technology, China), Xinling Zhang (University of Shanghai for Science and Technology, China), Chen Liang (University of Shanghai for Science and Technology, China), Changle Yu (University of Shanghai for Science and Technology, China), Chuntian Zhang (University of Shanghai for Science and Technology, China), and Qian Chen (University of Shanghai for Science and Technology, China)</i>	

Investigation of the Consistency Between Drivers' Subjective Feedback and Objective Performance in Multi-Information Human-Machine Interaction .....	388
<i>Zhengxin Liu (Chongqing Jiaotong University, China), Song Wang (Chongqing Jiaotong University, China), Wenjing Zhao (Hong Kong Polytechnic University, China), Xin Tian (Chongqing Jiaotong University, China), and Shujia Qiao (Chongqing Jiaotong University, China)</i>	
Formation Motion Planning of Heterogeneous UAV-UGV System Based on Potential Field Method and Rigid Graph Theory .....	394
<i>Qian Chen (University of Shanghai for Science and Technology, China), Chengchen Pan (University of Shanghai for Science and Technology, China), Yao Zhan (University of Shanghai for Science and Technology, China), Xiuchun Li (University of Shanghai for Science and Technology, China), Zhengyu Shi (University of Shanghai for Science and Technology, China), and Wen Pang (University of Shanghai for Science and Technology, China)</i>	
Multi-Source Information Fusion Based on DCAFN for Bearing Compound Fault Diagnosis ...	400
<i>Yuanhao Sun (Hunan University of Technology, China), Xiaojun Deng (Hunan University of Technology, China), Junfeng Man (Hunan First Normal University, China), and Xia Peng (Hunan First Normal University, China)</i>	
VSG Based Cooperation Control for Battery Energy Storage to Enhance Power System Frequency Stability .....	405
<i>Sitong Yan (Hunan First Normal University, China), Junjie Ma (Hunan First Normal University, China), Junfeng Man (Hunan First Normal University, China), Wei Yan (Hunan First Normal University, China), Haifeng Yu (State Grid Hunan Electric Power Company Limited, China), and Linxing Lv (Hunan First Normal University, China)</i>	
Two-Dimensional Trajectory Optimization for Autonomous Vehicles at Intersection .....	412
<i>Yuxin Jia (University of Shanghai for Science &amp; Technology, China), Qian Chen (University of Shanghai for Science &amp; Technology, China), Jing Zhao (University of Shanghai for Science &amp; Technology, China), and Khurram Jalil (University of Shanghai for Science &amp; Technology, China)</i>	
Prescribed-Time Formation Tracking Control with Collision Avoidance under Limited Information .....	417
<i>Shun Yang (Huazhong University of Science and Technology, China), Qiang Xiao (Huazhong University of Science and Technology, China), and Zhigang Zeng (Huazhong University of Science and Technology, China)</i>	
Multi-Branch Attention-Enhanced Contrastive Framework Based Domain Adaptation Method for Unsupervised Rolling Bearings Fault Diagnosis .....	422
<i>Haibo Liu (Hunan University of Technology, China), Junjie Ma (Hunan First Normal University, China), Junfeng Man (Hunan First Normal University, China), and Zhiguang Song (Beijing Huahang Weishi Robot Technology Co., Ltd, China)</i>	
Enhanced Pix2Pix Visible-to-Infrared Image Generation Network .....	427
<i>Wentao Zhang (Central South University, China), Peiqiu Huang (Central South University, China), Mengyu Li (Central South University, China), and Yong Wang (Central South University, China)</i>	
Improved YOLOv5 Algorithm for Remote Sensing Image Detection .....	433
<i>Yong Wang (Central South University, China), Yunlong Ding (Central South University, China), Mengyu Li (Central South University, China), and Tong Zhang (Central South University, China)</i>	

A Few-Shot Anomaly Detection Method Based on BYOL Contrastive Learning Framework .....	439
<i>Zhipeng Deng (Changsha University of Science and Technology, China), Junfeng Man (Hunan First Normal University, China), Zhiguang Song (Beijing Huahang Weishi Robot Technology Co., Ltd, China), and Gen Yang (Hunan First Normal University, China)</i>	
Smart Meter Outlier Detection using PCA Dimensionality Reduction and K-Means Clustering	444
<i>Xiang Gong (Hunan First Normal University, P.R. China) and Lisha Ma (Hunan First Normal University, P.R. China)</i>	
Cross-Weather 3D Point Cloud Semantic Segmentation .....	448
<i>Yuxin Liao (Nanchang University, China), Wei Li (Nanchang University, China), Pengxiang Su (Nanchang University, China), and Jie Liu (Nanchang University, China)</i>	
Research on Optimal Control Strategy of Markov Jump Systems Based on Fuzzy Clustering ....	453
<i>Zhiqiang Zhuang (Central South University, China), Shan Ma (Central South University, China), and Yunfeng Zhang (Central South University, China)</i>	
Performance Prediction of Power Metering Equipment Based on Wavelet-LSTM .....	461
<i>Tianshi Tan (Hunan First Normal University, P.R. China), Anxin Huang (Hunan First Normal University, P.R. China), and Lisha Ma (Hunan First Normal University, P.R. China)</i>	
Modeling and Prediction for the Total Head of Pressurized Pump Station Intake Pipe .....	466
<i>Hongqiu Zhu (Central South University, China), Quan Yu (Central South University, China), Sibao Xia (Central South University, China), and Yusi Dai (Central South University, China)</i>	
A Multivariable Adaptive Trend Extraction Method for Steady-State Detection .....	472
<i>Zelin Fan (Central South University, China)</i>	
A Fast Method for Point Feature Extracting and Matching .....	480
<i>Zhen Zhang (Guilin University of Aerospace Technology, China), Jianfang Zhu (Guilin University of Aerospace Technology, China), Jinzhao Wei (Guilin University of Aerospace Technology, China), and Guangping Zhang (Guilin University of Aerospace Technology, China)</i>	
K-Medians Clustering-Based Secure State Estimation .....	485
<i>Zhiyuan Wang (Beijing Information Science &amp; Technology University, China) and Cui Zhu (Beijing Information Science &amp; Technology University, China)</i>	
An Electrical Information Based Positioning and Homing Strategy for Intelligence Mobile Robot .....	490
<i>Zhe Liu (State Grid Shanghai Municipal Electric Power Company, China), Yingshuang Cao (State Grid Shanghai Municipal Electric Power Company, China), and Yueqiu Chen (Xiamen Wenyao Energy Technology Co., Ltd, China)</i>	
Design of Travel Time Prediction System Based on Multi-Source Data Fusion .....	494
<i>Qing-Yin Li (Shandong University of Technology, China), Qing-Wei Hou (Shandong University of Technology, China), Qing-Song Li (Shandong University of Technology, China), Yu-Jia Fang (Shandong University of Technology, China), Ze-Jun Li (Shandong University of Technology, China), and Yong-Sheng Yang (Shandong University of Technology, China)</i>	

Design of a Battery Charging Control System .....	499
<i>Xiaolong Wu (Hunan First Normal University, China), Zhouwen Tan (Hunan First Normal University, China), Jie Xiao (Hunan First Normal University, China), Weixiang Wang (Changsha NAV Communication Technology Co., Ltd, China), Tao Zhou (Hunan First Normal University, China), and Mingzhang Guo (Hunan First Normal University, China)</i>	
Path Planning of Non-Particle Model Robot in Confined Space .....	504
<i>Jiang Zhan (Changchun University of Science and Technology, China), Chengzhi Su (Changchun University of Science and Technology, China), Mingzhen Li (People's Liberation Army, China), Duo Zhang (AVIC, China), and Zichao Zhao (Jilin Institute of Metrology Science, China)</i>	
Multi-Resolution Collision Detection-Based Motion Planning Method and its Application in Live-Line Working Robots .....	510
<i>Mingyue Liu (Xi'an Jiaotong-Liverpool University, China)</i>	
A Visual Detection Method of Defective Products Based on Improved DeepLabv3+ Segmentation Network .....	517
<i>Yang Meng (Zhongguancun Robot Industry Innovation Center, China), Shibo Liu (Beihang University, China), Yong Tao (Beihang University, China), Honglei Mu (Tsinghua University, China), Haitao Liu (Beihang University, China), and He Gao (Beihang University, China)</i>	
Anti-Corner Reflector Jamming of Radar Seeker Based on Extreme Learning Machine .....	523
<i>Tianxiang Tang (Xi'an Institute of Electronic Engineering, China) and Linmao Qiu (Xi'an Institute of Electronic Engineering, China)</i>	
Expert Recommendation System Based on Knowledge Graph .....	528
<i>Ziyang Zhang (Shanghai University of Engineering Science, China) and Juan Zhang (Shanghai University of Engineering Science, China)</i>	
Heterogeneous Feature Dynamic Fusion Network for Pedestrian Re-Identification .....	533
<i>Guoyun Lian (Shenzhen Polytechnic University, China)</i>	
LW-YOLO: A Lightweight Network for Defect Detection in Photovoltaic Modules .....	538
<i>Weihaio Li (Jishou University, China), Jianqi Li (Jishou University, China), Binfang Cao (Hunan University of Arts and Science, China), Jiang Zhu (Hunan Provincial Key Laboratory for Control Technology of Distributed Electric Propulsion Aircraft, China), and Minghui Tian (Jishou University, China)</i>	
Development of an Intelligent Wheelchair System Utilizing Raspberry Pi for Enhanced User Mobility and Safety .....	544
<i>Zhihui Meng (Beijing Information Science and Technology University, China), Zi-hui Zhu (Beijing Information Science and Technology University, China), Yu-zhe Li (Beijing Information Science and Technology University, China), Rui Yang (Beijing Information Science and Technology University, China), Xin-yue Fu (Beijing Information Science and Technology University, China), and Yuan-xin Cai (Beijing Information Science and Technology University, China)</i>	
Error Compensation-Based Dual-PID Strategy for Multi-Channel Temperature Equalization Control .....	549
<i>Ao Ye (Beijing Information Science and Technology University, China), Fubing Li (Beijing Information Science and Technology University, China), Zongmin Zhao (Beijing Information Science and Technology University, China), and Bingxia Shen (Beijing Information Science and Technology University, China)</i>	

Ensemble Methods with Self-Adaptive Response Mechanism for Dynamic Multi-Objective Optimization .....	556
<i>Xuan Zhao (Huaibei Normal University, China), Fangzhen Ge (Huaibei Normal University, China), Debao Chen (Huaibei Normal University, China), Longfeng Shen (Huaibei Normal University, China), and Huaiyu Liu (Huaibei Normal University, China)</i>	
Adaptive Bidirectional Asymptotic Feature Pyramid Network for Object Detection .....	562
<i>Hao Lu (Central South University, China), Yiqun Zou (Central South University, China), Zhiyao Zhang (Central South University, China), and Yong Wang (Central South University, China)</i>	
An Improved Pied Kingfisher Optimization Algorithm Based Approach to Path Planning in Spatial Crowdsourcing .....	568
<i>Xu Zhang (Huaibei Normal University, China), Minglan Fu (Huaibei Normal University, China), and Xingyu Zhou (Huaibei Normal University, China)</i>	
A Multi-Objective Discrete Carnivorous Plant Algorithm for Flexible Job Shop Considering Energy Consumption .....	575
<i>Jiapeng Chen (Huaibei Normal University, China), Xinkang Li (Huaibei Normal University, China), Chun Wang (Huaibei Normal University, China), and Yonghong Xu (Huaibei Normal University, China)</i>	
Solving Multi-Objective Optimization Problems via Selective Inheritance Meta-Reinforcement Learning .....	582
<i>Mingshi Wang (Huaibei Normal University, China), Fangzhen Ge (Huaibei Normal University, China), Debao Chen (Huaibei Normal University, China), Longfeng Shen (Huaibei Normal University, China), and Huaiyu Liu (Huaibei Normal University, China)</i>	
Welding Simulation and Process Parameter Optimization of U-rib Fillet Weld Based on Genetic Algorithm .....	588
<i>Sen Li (Wuhan University of Technology, China), Hong Lu (Wuhan University of Technology, China), Yongquan Zhang (Wuhan University of Technology, China), Guangao Yang (Wuhan University of Technology, China), Lang Yu (Wuhan University of Technology, China), Zhi Liu (Huanggang Normal University, China), and Neng Wang (Hubei Honglu Steel Structure Co., Ltd, China)</i>	
A Fatigue Detection Algorithm for Manufacturing Workers Based on Face Alignment .....	593
<i>Jinlei Cui (Ningbo University, China), Honglei Shao (Ningbo University, China), Fangyan Dong (Ningbo University, China), and Kewei Chen (Ningbo University, China)</i>	
An Efficient Multi-Agent Collaboration Algorithm for Battlefield Kill Chains via Deep Reinforcement Learning .....	599
<i>Jie Zhang (Nanjing Research Institute of Electronic Engineering, China), Yu Liu (Nanjing Research Institute of Electronic Engineering, China), Chao Wang (Nanjing Research Institute of Electronic Engineering, China), Dong Li (Nanjing Research Institute of Electronic Engineering, China), Tianqi Lv (Nanjing Research Institute of Electronic Engineering, China), and Liang Zhang (Nanjing Research Institute of Electronic Engineering, China)</i>	
Facial Emotion Recognition Based on Local Feature .....	603
<i>Jinye Lu (Northwest Normal University, China), Yuhong Ma (Northwest Normal University, China), Fangyuan Zheng (Northwest Normal University, China), and Juntao Wang (Northwest Normal University, China)</i>	

Knowledge Distillation for Object Detection Based on Feature Enhancement and Dynamic Fusion .....	607
<i>Yong Wang (Central South University, China), Qian Huang (Central South University, China), Zhiyao Zhang (Central South University, China), and Tong Zhang (Central South University, China)</i>	
<b>Author Index .....</b>	<b>613</b>