2023 2nd International **Conference on Artificial Intelligence, Human-Computer Interaction and Robotics** (AIHCIR 2023)

Tianjin, China 8 - 10 December 2023



IEEE Catalog Number: CFP23UU9-POD ISBN:

979-8-3503-6037-0

Copyright © 2023 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:
 CFP23UU9-POD

 ISBN (Print-On-Demand):
 979-8-3503-6037-0

 ISBN (Online):
 979-8-3503-6036-3

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



2023 2nd International Conference on Artificial Intelligence, HumanComputer Interaction and Robotics (AIHCIR) AIHCIR 2023

Table of Contents

Message from General Chairs	
023 2nd International Conference on Artificial Intelligence, Hu Computer Interaction and Robotics (AIHCIR)	man
Research on the Psychological Stress of Pilots Under Complex Flight Interaction Tasks	1
Depth Image Restoration for High-Level Vision Tasks	6
devitalization of Ancient Painting: An Interactive Device Based on Augmented Reality and Human-Computer Interaction Technology Empowers Ancient Chinese Painting Exhibitions Tianqi Chen (Capital Normal University, China)	13
Gero-Shot Visual Question Answering Based on Large Language Model for Extracting Hidde Gnowledge	
A Personalized Course Recommendation System has Been Developed Using xDeepFM and coBERTa Models Bin Yang (Dalian Minzu University, China) and Chongzhen Qi (Dalian	27
Minzu University)	

Automatic Area Measurement of Ring Cooler Corner Images Based on EU-Net Wei Wang (University of Science and Technology Beijing, China), Dezheng Zhang (University of Science and Technology Beijing, China), Qing Li (University of Science and Technology Beijing, China), Jing Li (University of Science and Technology Beijing, China), Jinge Ma (University of Science and Technology Beijing, China), and Yaming Xi (University of Science and Technology Beijing, China)	32
Selective Representation of Multi-Agent Q Learning Pengcheng Liu (Sichuan University, China), Kangxin He (Sichuan University, China), and Hui Li (Sichuan University, China)	40
An Improved YOLOv5 Multi-Scale Object Detection Method	50
Virtual Keyboard System Based on IMU Glove	56
PSO-Based Black-Box Lane Detection Adversarial Attack	62
Background Interference-Based Temporal Enhancement for Action Recognition Su Liu (Chongqing University of Posts and Telecommunication, China), Xinyi Wang (Chongqing University of Posts and Telecommunications, China), Xue Chen (Chongqing Housing Provident Fund Management Center, China), Ying Huang (Chongqing University of Posts and Telecommunications, China), and Bangrui Wan (Chongqing University of Posts and Telecommunications, China)	68
YOLOv5-Pothole: An Improved Pothole Perception Method Based on YOLOv5-seg Xiaokang Chen (Beijing Union University, China), Nan Ma (Beijing University of Technology, China), and Mohan Wang (Beijing University of Technology, China)	75

Visiting Spacecraft Rendezvous and Docking Information Management Technology and Application
Hongtao Nan (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), Zheng Zhao (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), Weihe Diao (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), Xiaoyang Yin (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), Wei Cheng (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), Fangjing Weng (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China), and Ying Wang (Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology, China),
Re ² GCC: Retrieve-Rerank-Generate Framework for Code Completion
Research on UWB Localization Algorithm Based on Improved BP Neural Network and Kalman
Filter
Distance-Ranking-Based Weighted Triplet Loss for Visual Place Recognition
A Traffic Sign Recognition Method Based on Improved VGGNet Model
Application of Object Detection Algorithm Based on Deep Learning in Classification of wild Ginseng Grades
Research on Path Planning of Autonomous Vehicle Based on Improved Ant Colony Algorithm 111 Xin He (QILU Institute of Technology, China), Yunbo Huang (QILU Institute of Technology, China), Tao Mi (QILU Institute of Technology, China), Yingting Guo (University of Science and Technology Beijing, China), Hao Yue (QILU Institute of Technology, China), and Xiangju Liu (QILU Institute of Technology, China)
Research and Application of Trajectory Tracking Control Algorithm Based on LQR and PID 116 Zhou Wang (Tiangong University, China) and Weixing Su (Tiangong University, China)

SFED-Former: A Symmetrical Feature Enhanced DETR for Video Lane Detection
TDT: Two-Stream Decoupled Transformer for Text-Driven Human Animation Generation 126 JiaShuang Zhou (Wuhan Textile University, China), Xiaoqin Du (Wuhan Textile University, China), Yifan Lv (Wuhan Textile University, China), and Yongqi Liu (Wuhan Textile University, China)
YOWO-Res: A Better CNN Architecture for Spatiotemporal Action Detection
Combined Active and Passive Variable Admittance Compliant Control for Teleoperation Robotic Systems
Prediction of Flue-Cured Tobacco Leaves Aroma Quality and Volume Based on Genetic Algorithm and Support Vector Machine
Recognition of Epilepsy EEG by Two-View Adversarial-Incentived-Based T-S Fuzzy Classifier 146 Jia Zhai (Jiangsu University of Science and Technology, China), Guanghao Song (Jiangsu University of Science and Technology, China), and Ta Zhou (Jiangsu University of Science and Technology, China)
Classification of Acute Radiation Dermatitis by Active-Guided-Based T-S Fuzzy Classifier 154 Guanghao Song (Jiangsu University of Science and Technology, China), Jia Zhai (Jiangsu University of Science and Technology, China), and Ta Zhou (Jiangsu University of Science and Technology, China)
A MEMS Gyroscope Arrays Error Calibration Method Based on LSTM
FDENet: Frequency Domain Enhancement Network for Clothing Category Classification 166 Yankang Shi (Wuhan Textile University, China), Chenghu Du (Wuhan Textile University, China), and Xiaokun Wu (Wuhan Textile University, China)

PCB Defect Detection Based on Improved YOLOv7-Tiny	. 172
Auto-FS-Cardiac: Optimizing ECG Heartbeat Classification with Automated Feature Selection Using TPOT Template Framework	
Frequency Domain Alignment for Knowledge Distillation in Clothing Classification	. 186
CloNet a Fine Grained Classification Network for Clothing Style Image	, 192
Enhancing Multi-Finger Vein Recognition Based on Multi-Task Learning	. 198
CA-FashionNet: Light-Weight Hybird Model for Fashion Style Classification	. 204
3D Visualization Indoor Positioning System with Sequence Feature Enhancement Transformer	
Network	. 209
A Hybrid Method for Remote Sensing Change Detection	. 215
Research on Multimodal Image Display System with Electrovibration-Based Tactile Rendering 220	3
Chuanlong Zhang (Nanjing University of Aeronautics and Astronautics, China), Jiaojiao Liu (Nanjing University of Aeronautics and Astronautics, China), Shouchun Wang (Nanjing University of Aeronautics and Astronautics, China), Yifan Long (Nanjing University of Aeronautics and Astronautics, China), Yunlong Wu (Nanjing University of Aeronautics and Astronautics, China), and Xiong Lu (Nanjing University of Aeronautics and Astronautics, China)	
A co-Located Mobile Collaborative Augmented Reality for Shared Experiences Ji Ding (Beijing Aerospace Automatic Control Institute; National Key Laboratory of Science and Technology on Aerospace Intelligence Control, China) and Wei Fang (Beijing University of Posts and Telecommunications, China)	. 225
A Blockchain Based Cryptographic Data Hiding and Transmission Scheme Jingqi Yang (China Electronics Technology Group Corporation, China), Huaihai Hui (China Electronics Technology Group Corporation, China), Pansong Dou (China Electronics Technology Group Corporation, China), and Peivun Liu (China Electronics Technology Group Corporation, China)	. 230

Pharmacy Infusion Bottle Detection Based on Improved YOLOv8	. 237
VulDeCRG: A Vulnerability Detection System Based on Code Representation Graph	. 243
Ground Calibration of Long-Focal Plane Array Optical Cameras Based on Planar Target and Collimated Light Tube	248
Lightweight Road Pothole Detection Network Based on FCOS	253
Protective Gloves Reflective Clothing Detection Algorithm Based on Improved Yolov8n	. 259
LWSeg: Lightweight Eye Segmentation Model for Gaze Estimation Sen Yan (East China University of Science and Technology, China), Xiaowei Bai (National Innovation Institute of Defense Technology, China), Yugang Niu (East China University of Science and Technology, China), Liang Xie (National Innovation Institute of Defense Technology, China), Ye Yan (National Innovation Institute of Defense Technology, China), and Erwei Yin (National Innovation Institute of Defense Technology, China)	. 266
Effective Information Guidance for Chinese Font Generation with Skeleton and Channel Expansion Jie Zhou (Jiangxi Normal University, China), Yefei Wang (Jiangxi Normal University, China), Yiyang Yuan (Jiangxi Normal University, China), Qing Huang (Jiangxi Normal University, China), and Jinshan Zeng (Jiangxi Normal University, China)	. 273
Research and Application of Intelligent Inspection and Fire Extinguishing Robots for Petroleum and Petrochemical Industry	.288
Machine Learning Fire Visual Recognition Based on Fusion of SFF-SVM	.298

Structural Segmentation and Large Language Model Make Behavior Tree More Explainable 305 Hang Su (Intelligent Game and Decision Lab (IGDL), China), Xiaoqing Zhao (Tianjin Artificial Intelligence Innovation Center (TAIIC), China), Fu Li (Intelligent Game and Decision Lab (IGDL), Tianjin Artificial Intelligence Innovation Center (TAIIC), China), Zhengyang Guo (Tianjin Artificial Intelligence Innovation Center (TAIIC), China), Yunlong Wu (Intelligent Game and Decision Lab (IGDL), Tianjin Artificial Intelligence Innovation Center (TAIIC), China), and Yanzhen Wang (Intelligent Game and Decision Lab (IGDL), Tianjin Artificial Intelligence Innovation Center (TAIIC), China)
Research on Fire Localization Based on Binocular Vision
U-Shaped Network Utilizing Tokenized Mlp and Strong Convolution for Ultrasonic Medical Image Segmentation
LTMVSNet: A Lightweight Transformer Network for Multi-View Stereo
Multi-Scale Residual Encoder with Cascaded Attention for 3D Human Model Generation 337 Xinrong Hu (Wuhan Textile University, China), Peiran Yang (Wuhan Textile University, China), Jinxing Liang (Wuhan Textile University, China), Tao Peng (Wuhan Textile University, China), and Junping Liu (Wuhan Textile University, China)
An Apparel Image Segmentation Method Utilizing a Prior Probability Mask Graph
Port Smart Gate Ground Scale Line Pressure Detection Using Federated Learning: Backdoor Attacks
End-Effector Impedance Control of Robotic Arm Based on Enhanced Neural Network RBF-PID-PSO
Gengyao Wu (Zhejiang Electric Power Co.Ltd, China), Pengfei Zhang (Zhejiang Electric Power Co.Ltd, China), Jie Zhang (Zhejiang Electric Power Co.Ltd, China), Ang Ma (Beijing University of Posts and Telecommunications, China), and Weitao Xu (Beijing University of Posts and Telecommunications, China)

COT2DNet: Contextual 2D Attention for Scene Text Recognition Yefei Qian (Xinjiang Key Laboratory of Signal Detection and Processing; Xinjiang University, China), Mayire Ibrayim (Xinjiang Key Laboratory of Signal Detection and Processing; Xinjiang University, China), Askar Hamdulla (Xinjiang Key Laboratory of Signal Detection and Processing; Xinjiang University, China), and Chunhu Zhang (Xinjiang Key Laboratory of Signal Detection and Processing; Xinjiang University, China)	405
Network Flow-Based Dynamic Detection System for Android Adware Using Pre-Trained I 410	Models
Wei Ye (Wuhan Textile University, China), Wei Yin (Wuhan Textile University, China), and Junwei Tang (Wuhan Textile University, China)	
Diffusion Model for Image Generation - A Survey	416
An Evaluation Method of Environmental Disturbance Factors Affecting Visible Light Perception System of Unmanned Ships	425
MFFNet: Multi-Modal Feature Fusion Network for Instance Segmentation of Froth Flotation	
Images Wenkai Dong (University of Science and Technology Beijing, China), Leiming Liu (University of Science and Technology Beijing, China), Xiaoqi Chen (Sichuan Tori Information Engineering Co., Ltd., China), Jianfu Ma (Sichuan Tori Information Engineering Co., Ltd., China), Tianxiang Zhang (University of Science and Technology Beijing, China), and Jiangyun Li (University of Science and Technology Beijing, China)	430
Clothing Retrieval Algorithm Based On Deep Metric Learning	435
Object Detection Method and its Application Based on YOLOv5	441
Research on Accuracy Verification of an Intelligent Tennis Practicing Device Based on Stochastic Differential Equations	446
Data-Driven Chinese Knowledge Graph Construction for Furniture Products	450

Interactive Recommendation Algorithm Based on Combination of DFM and Offline Reinforcement Learning	
Textile University, China), Wei Shen (Wuhan Textile University, China), and Xiong Wei (Wuhan Textile University, China)	
Enhancing Medical Image Segmentation: A Source-Free GAN-Based Approach	
Workpiece Segmentation Based on Improved YOLOv5 and SAM	
Research on Colour Correction in Image Stitching With Equal Depth of Field	
Ride-Hailing Demand Prediction Based on Hotspot Areas	
A Straw Coverage Rate Calculation Method Based on Single Image Processing	
Human Motion State Recognition Method Based on Plantar Pressure Sensing Technology491 Zhiwei Xu (Fuzhou University, China), Chenhao Tian (Fuzhou University, China), Xiaolin Zhu (Fuzhou University, China), and Zongxing Lu (Fuzhou University, China)	
A Review of SAM-Based Visual Semantic Segmentation	
A Survey of Human Action Recognition Based on Graph Convolutional Networks	
A Review of Multi-Agent Collaborative Control	

A Survey on Cooperative Control of Multi-Agent Systems	511
Modified Genetic Algorithm for Solving Function Optimization Problems Maoyu Du (Tianjin University of Technology and Education, China), Qiudong Yu (Tianjin University of Technology and Education, China), Feng Jia (Tianjin Aishendesi Technology Co., Ltd, China), and Sihao Hu (United International College, China)	516
An Improved Underwater Target Detection Algorithm Based on YOLOv8	521
Research on Human-Computer Interaction Based Tool Design for Agricultural Mulch Film Cleanup Assistance Lingxi Huang (Beijing Institute of Technology, China), Yun Chen (Beijing Institute of Technology, China), and Yuqing Zhang (Beijing Institute of Technology, China)	526
Research on Motor Imagery EEG Classification Method Based on Region of Interest and Electrophysiological Source Imaging Technology	532
The Research on Navel Oranges Detection Systems of Harvesting Robots Based on an Improved YOLOv5	
A Memory Object Sensitive Detecting Method for Use-After-Free Vulnerabilities	543
Research on Motor Imagery EEG Analysis Method based on "One-vs-Rest "CSP and Sparse Embedding	548
Kalman Filtering for Discrete-Time Switched System with Uncertainties	553
False Complaint Report Detection Based on Contrastive Learning Model	559
Intelligent Interface for Synthesizing Procedural Stone Forest Landscape	565

Visual Attention-Guided Weighted Naïve Bayes for Behavior Intention Inference Chao Pan (Wuhan University of Science and Technology, China), Hongping Fang (Wuhan University of Science and Technology, China), Hanyuan Zhang (Wuhan University of Science and Technology, China), Zhonghua Wan (Wuhan University of Science and Technology, China), Ling Mei (Wuhan University of Science and Technology, China), and Shiqian Wu (Wuhan University of Science and Technology, China)	569
Enhancing Prototype Networks for Relation Classification with Multi-Feature and Confusing Loss Function in Low-Resource Scenarios	575
Deep Graph Convolutional Neural Network for Fault Diagnosis of Complex Industrial Processes Chuan Zhang (Beijing University of Chemical Technology, China), Qunxiong Zhu (Beijing University of Chemical Technology, China), Yanlin He (Beijing University of Chemical Technology, China), Yang Zhang (Beijing University of Chemical Technology, China), Mingqing Zhang (Beijing University of Chemical Technology, China), and Yuan Xu (Beijing University of Chemical Technology, China)	581
Migration Algorithm of EEG Signal Classification Model Based on Federated Aggregation Li Li (Beijing University of Posts and Telecommunications, China), Nan Sun (Beijing University of Posts and Telecommunications, China), and Baofa Wei (Beijing University of Posts and Telecommunications, China)	586
Elevating Perception: Unified Recognition Framework and Vision-Language Pre-Training Using Three-Dimensional Image Reconstruction	
The Robot Fusion Mapping Method Applied in Indoor Poultry Farming Environment Jianming Zhang (East China University of Science and Technology, China), Jiasheng Lei (East China University of Science and Technology, China), Yuting Zhao (East China University of Science and Technology, China), Kaixiong Yang (East China University of Science and Technology, China), Luoran Liu (East China University of Science and Technology, China), Xin Peng (East China University of Science and Technology, China), and Kaixun He (Shandong University of Science and Technology, China)	597
Toxicity Prediction Study of Small Molecules Based on Graph Attention Networks	603
A Method of Computer Automatic Scoring for Subjective Questions	608