

# **2024 IEEE International Conference on Cognitive Computing and Complex Data (ICCD 2024)**

**Qinzhou City, China  
28-30 September 2024**



**IEEE Catalog Number: CFP24QZ8-POD  
ISBN: 979-8-3503-5290-0**

**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:	CFP24QZ8-POD
ISBN (Print-On-Demand):	979-8-3503-5290-0
ISBN (Online):	979-8-3503-5289-4

**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

# Table of Contents

---

## Session 1: Large Model Technology, Optimization, and Application

A Bagging RAG Public Opinion Analysis and Guidance Tool Driven by Large Language Model.....	1
<i>Chenjun Tang, Ze Li and Liangbing Zhu</i>	
A Review on Large Model-oriented Advertising Auction.....	7
<i>Ziwei Wu and Junwu Zhu</i>	
DF-SegDiff: A Diffusion Segmentation Model using a New Distributed Parallel Computing Algorithm.....	13
<i>Hancang Mi, Hong-Seng Gan, Xiaoyi Wang, Akinobu Shimizu, Muhammad Hanif Ramlee and Mehmet Zubeyir Unlu</i>	
Group-Mix SAM: Lightweight Segmentation Solution for Industrial Implementations.....	18
<i>Liang Wu, Puhong Duan and Xiaoguang Ma</i>	
Person Re-identification Method Based on Video Spatial Feature Enhancement.....	23
<i>Zunwang Ke, Guozhi Sun, Run Guo, Minghua Du and Yugui Zhang</i>	
Utilizing Spatial Transformers and GRU for Temporal Context in 3D Human Pose Estimation.....	31
<i>Chen Cheng, Huahu Xu and Jian Kang</i>	

## Session 2: Image Processing and Pattern Recognition

A Hand Action Recognition Framework Based on Multimodal Foundation Model and Tracking of Skeleton Point Trajectories .....	36
<i>Liang Wu, Xiaoyu Jiang and Xiaoguang Ma</i>	
Clothes Changing Person Re-identification via Pose and Style Normalization Network.....	41
<i>Chunyun Meng, Sai Liang, Hongli Li and Yuki Todo</i>	
Cycle-Consistent Generative Adversarial Network Augmented MobileNetV3 for Robust Grape Leaf Disease Classification.....	47
<i>Shahin Aghabalayev, Yao Liu, Yongfeng Tang and Rendong Ji</i>	
Data Transfer for YOLOv5 Based on Selector Network and Partial Pseudo-Labels.....	53
<i>Guoqiang Qu, Jianchu Lin, Haiyi Bian, Haiping Zhou, Muhammad Raees UL Haq and Bo Jiang</i>	
Garbage Image Classification Based on Improved ShuffleNet Fusion Algorithm.....	57
<i>Kaikai Shang, Shaozhang Xiao, Ken Lin, Kangliang Xiao and Yin Xia</i>	
Improved YOLOv8n Helmet Detection Algorithm for Missed and False Detection.....	63
<i>Jing Li, Chengjun Qiu, Yuangan Wang and Song Wang</i>	
Online Multi-Object Tracking Based On Global Feature Enhancement Network And Historical Feature Complement Iteration.....	69
<i>Zunwang Ke, Puping An, Gang Wang and Yugui Zhang</i>	
Optimization Model for Garbage Image Classification Based on RepVGG.....	77
<i>Ken Lin, Shaozhang Xiao and Kai Kai Shang</i>	

Pulmonary Nodule Detection and False Positive Reduction based on Mamba.....	83
<i>Xiang Xu, Chen Xu, Caiping Xi and Huiyang Lu</i>	
Remote Sensing Identification and Evaluation Method for Oyster Resources in Marine Pasture Rafting.....	89
<i>Guangping Zhang, Chenxiao Zhang and Jinzhan Wei</i>	
Remote Sensing Object Detection Based on Adaptive Spatial Attention.....	96
<i>Xuanchen Liu, Yuqi Yao, Gang Wang, Zhiyu Wu and Tingting Jia</i>	
Research on Motion Posture Based on Convolutional Neural Network Algorithm.....	103
<i>Yunpeng Tang and Yu Zou</i>	
Shallow Sea Bathymetric Inversion Based on Multispectral Remote Sensing Images.....	107
<i>Xuanzhi Liao, Qian Qiu and Yongfeng Qin</i>	
Ship Target Recognition Based on Improved Residual Network.....	114
<i>Junfeng Wang and Bo Du</i>	
TGC-YOLO: Detection Model for Small Objects in UAV Image Scene.....	119
<i>Taoyang Jin, Wenhao Wang, Chenjin Sun Zhenyang Yu, Yanlun Wu and Xin Chen</i>	
Three-dimensional Reconstruction of Wire-structured Optical Welds and Point Cloud Filtering Methods.....	125
<i>Yili Shen and Chuixi Zeng</i>	
Traffic Sign Small Object Detection Algorithm Combining Multi-feature and Accurate Location.....	131
<i>Zunwang Ke, Shuaibo Chen, Minghua Du, Jisheng Zhou and Yugui Zhang</i>	
WGS_YOLO_dual: A Detection Model for Strip Steel Surface Defects Based on Attention Mechanism and Spatial Pyramid Pooling Structure.....	139
<i>Qi Liu, Yong Zhong, Wenin Yang, Ziliang Liu, Jinli Ruan and Zhongrong Zeng</i>	

### Session 3: Big Data and Knowledge Graph

A Novel Framework for Real-Time Water Quality Analysis in Agriculture via ANN and Remote Sensing.....	144
<i>Hera Naeem, Amir Ali Mokhtarzadeh, M. Shahzaib Naeem, Kiyindou Michel Precieux and Sadaf Shah</i>	
Analysis of Non-Heritage Film and Television Viewing Based on AdaBoost-BP Algorithm.....	150
<i>Yining Zhao</i>	
Enhanced Data Augmentation and Hierarchical LSTM for UAV Intent Prediction.....	154
<i>Mingwei Zhao, Yonglong Zhang, Xu Liu, Mingxuan Liang and Xueqing Li</i>	
Equilibrium Analysis of AI Investment in Financial Markets under Uncertainty.....	162
<i>Sahil Varma Penmetsa</i>	
GAMJL: A Chinese Named Entity Recognition Method Based on Gated Attention Mechanism and Joint Learning.....	173
<i>Yi Wang, Junwu Zhu, Erfeng Xu and Wei Lin</i>	
Knowledge-Enhanced Contextual Auction Design Based on Deep Neural Networks.....	181
<i>Mingxuan Liang, Zhibo Guo, Junwu Zhu, Yuanyuan Zhang and Xueqing Li</i>	
Machine Learning for Talent Analytics: Unveiling Competency Indicators in Live Streamer.....	189
<i>Caisheng Liao, Yuki Todo, Minyu Wang and Yingwei Pan</i>	
Research on Enterprise Data Assets Based on Fusion Neural Network Algorithm.....	195
<i>Lili Dong, Ruishuang Qi and Tiantian Yang</i>	
Research on Sentiment Analysis Method of Fan Culture Based on CNN-LSTM.....	199
<i>Aiting Pan, Yuangan Wang, Junqi Luo and Qingqing Wang</i>	
RSSNet: A Novel Network Model for FRBs Search.....	204
<i>Mengyao Li, Bo Qiu, A-li Luo, Cuixiang Liu, Baisen Ma and Yicong Chen</i>	
Sustainable Cultivation Method of College Student Innovation Teams Based on Knowledge Graph.....	210
<i>Yujuan Yang</i>	
Vortex-induced Vibration of Two Rigidly Coupled Tandem Cylinders: A Numerical Study.....	217
<i>Weiya Zou, Suxiang Guo and Mengtian Song</i>	

### Session 4: Cyber Security and Analys

A Secure Communication Mechanism Scheme for the Internet of Things Based on Chebyshev Chaotic Map.....	223
<i>Wenchuan Zhang</i>	
Advanced Email Security with NLP and the Isolation Forest Algorithm.....	228
<i>Ujas Bhadani</i>	
Access Control Attribute Mining Model Based on ALBERT-PFN.....	235
<i>Zhaoxiong Bu, Li Ma, Jihui Li, Linjiu Guo, Yong Zhong and Zhongrong Zeng</i>	
Efficient Privacy-Preserving Federated Learning with Byzantine Robustness.....	241
<i>Chunhua Jin, Lulu Li, Jiahao Wang, Youwang Sun, Ying Jin and Guanhua Chen</i>	
Financial System Risk Warning Based on Deep Learning.....	247
<i>Wenjie Wang, Shufeng Wei, Yanyan Liu and Yongxiang Wang</i>	
HRAM: Underwater Hierarchical Route Allocation Mechanism Based on Load Balancing.....	253
<i>Na Liu, Yi Jiang and Xinpeng Lu</i>	
SERNET-T: A Smart Contract Multi-Label Vulnerability Detection Model Based on SE Attention and One-Dimensional Residual Network.....	260
<i>Linjiu Guo, Wenying Yang, Luobin Hu, Li Ma, Zepeng Wu and Zejian Lu</i>	

## **Session 5: Robotic Technology and Computer Vision**

Design and Research of a Magnetorheological Robot Calf Based on Fuzzy Switchable Damping Control.....	266
<i>Chenglong Zhao, Zhen Liu and Liucun Zhu</i>	
Design of a Lower Limb Exoskeleton Rehabilitation Robot System Based on Forward Dynamics Simulation.....	272
<i>Yudong Fang, Yuefei Wang, Liucun Zhu, Zhen Liu, Lei Shi, Muxin Du and Jianchu Lin</i>	
Development of a Control System for a Lower Limb Exoskeleton Rehabilitation Robot for Stroke Patients with Standing Instability .....	277
<i>Muxin Du, Qingqing Wang, Liucun Zhu, Zhen Liu, Lei Shi, Yudong Fang and Yinxi Gu</i>	
Motion Intent Recognition Algorithm for Lower Limb Rehabilitation Robots Based on Dual-Physics Sensor Feature Fusion.....	281
<i>Haiyu Lu, Peng Zhao, Fengling Ma, Junhao Ma, Xiangning Wu and Xueshan Gao</i>	
PRO-SLAM: A Visual SLAM Algorithm Based on Feature Mismatch Rejection and Map Construction.....	287
<i>Xiao Wu, Liucun Zhu, Tao Ma, Nanxiang Wang and Sijie Chen</i>	
Research on Factor Graph-based SLAM Localization Algorithm for Multi-source Sensor Fusion.....	294
<i>Tao Ma, Liucun Zhu, Xiao Wu, Sijie Chen and Nanxiang Wang</i>	
Research on the Teaching Mode of Industrial Robots under the Modern Industrial College Model.....	302
<i>Yuefei Wang, Jiaye Li, Yudong Fang and Junqi Luo</i>	
Robust Control of Lower Extremity Exoskeleton Rehabilitation Robot Based on Nominal Modeling.....	306
<i>Zhuangqun Song, Peng Zhao, Rong Yang, Xiangning Wu, Chao Yang and Xueshan Gao</i>	
The Electrical Control System for The Automatic Plug-seedling Feeding Device of Pepper Transplanting Machine Based on Arduino.....	314
<i>Xueqi Wei, Zhengmin Li, Guang Liao and Fujun Zhou</i>	

## **Session 6: Internet of Things and Intelligent System**

A Smart Hybrid Model for Fruit Quality Grading: Merging Canny Edge Detection and K-means Clustering Algorithm.....	320
<i>Samuel Enobong Sunday, Lie Liu, Huang Fei, Yongfei Ju and Hong Ki An</i>	
Adaptive Backstepping Heading Control for Wave Glider.....	325
<i>Paixia Li, Liucun Zhu, Wukang Tan and Zeliang Zhu</i>	
Advanced Watershed Water Level Prediction Method Based on an Enhanced Informer Model.....	332
<i>Yuexin Liu, Weiwei Shou, Dongqiang Chen, Xuefeng Wang and Chu Zhang</i>	
AI Mediated Surface Waste Auto-detection on Water Bodies Using Cutting Edge Technology.....	336
<i>Vijaya Choudhary, Paramita Guha, Archana and Sharmistha Dey</i>	

An Improved NGO Algorithm for Optimizing VMD-CNN-BILSTM-Cross Attention Bearing Fault Diagnosis Method.....	341
<i>Jiapeng Luo and Xiaobing Chen</i>	
Automatic Feed Dispenser for Aquaculture using Arduino Technology.....	N/A
<i>Raghuvira Pratap Adimulam, Vasanth Kokkiligadda and Aaryasri Polagani</i>	
Back Propagation Neural Network Based Positional Positive Solution for Wave Compensation Device.....	352
<i>Tao Tang, Limin Tao, Wei Han, Jing Zhang and Bicheng Jiang</i>	
Bending Prediction of Bulb Flat Steel By Neural Network Algorithm Based On SSA-BP.....	357
<i>Jinhui Luo, Liangwei Wang, Bofeng Xiao, Shan Gao, Wei Li, Jiankun Deng, Chenpeng Liang, Yijiang Xia</i>	
Credit Value Based Autonomous Vehicles Joint Task Offloading Optimization.....	364
<i>Yongyi Yang, Taoshen Li and Zhihui Ge</i>	
Digital Meter Detection and Reading Recognition Based on Improved YOLOv9.....	374
<i>Wenhao Wang, Chenjin Sun, Taoyang Jin, Zhenyang Yu, Yanlun Wu and Xin Chen</i>	
Enhanced-AlexNet for Smart Detection of Tomato Seedling Disease.....	380
<i>Joel Richmond Adeshida, Lie Liu, Ahmed N. Abdalla, Yongfei Ju and Bo Chen</i>	
Identification of Haploid Maize Seeds Using Efficient Channel Attention with Selective Kernel Networks and Multi-layer Stacked Ensemble.....	385
<i>Lieto Wamunyima, Haiyi Bian and Bobwillie Kessellie Sulonteh. Jr</i>	
Impact of Online Education on Academic Performance in Sino-Foreign Joint Programs during COVID-19 Prevention.....	390
<i>Junqi Luo, Yuangan Wang, Liucun Zhu and Yuefei Wang</i>	
Improved YOLOv8 factory safety wearable detection algorithm.....	395
<i>Wenhao Wang, Buying Fu, Yanlun Wu, Zhenyang Yu, Chenjin Sun and Xin Chen</i>	
Intelligent Speech Enhancement Algorithm Model Based on Recorded Classroom Audio.....	401
<i>Xinyun Zhang, Li Shen, Li Zhou, Dawei Luo, Dejiang Mo and Xiaonan Luo</i>	
Load Forecasting for Electric Propulsion Vessels Based on RBF Neural Network.....	407
<i>Puze Li, Chengjun Qiu, Wei Qu, Ke Li, Haozheng Liu and Wei Tao</i>	
Numerical Simulation of Vortex-Induced Vibration in Inclined Elliptic Cylinders for Marine Energy Applications.....	412
<i>Yanhong Li, Suxiang Guo and Mengtian Song</i>	
Overview of Tool Wear Condition Monitoring Technology.....	418
<i>Kailun Liu and Zhibin Miao</i>	
Prediction of Energy Efficiency and Environmental Sustainability in Greenhouse Tomato Production: Insights and Analysis.....	424
<i>Mahdi A. Mahdi, Wafaa K. Mahmood, Yongfeng Tang, Yao Liu and Hong Ki An</i>	
Research on Power Load Forecasting Based on a Time Convolutional Network Autoencoder Stacked Extreme Learning Machine Model.....	429
<i>Weiwei Shou, Peng Cai, Junyang Xu, Rongkai Zhao and Tian Peng</i>	
Research on Short-term Wind Power Forecasting for Offshore Wind Farms Based on VMD and Optimized RFR.....	436
<i>Qiuyu Chen, Yongling He and Jing Li</i>	
Research on the Applicability of Convolutional Neural Network Models in the Integration of Industry and Education in Vocational Colleges.....	442
<i>Ruishuang Qi, Lili Dong and Tiantian Yang</i>	
Research Review of Ship Power Load Forecasting Based on Intelligent Optimization Algorithms.....	446
<i>Ningjia Meng, Jiahao Mei, Kang Shen, Tianqin Liang, Yuanyuan Zhang and Jijin Xie</i>	
Review on Power Grid Fault Prediction and Location Technologies.....	456
<i>Fang Liu, Ningyang Ji, Meng Sun and Zeyu Zhu</i>	
State of Health Assessment of Lithium Batteries Based on Fusion Model and Feature Extraction.....	466
<i>Qiwei Zhang, Yulong Li, Peipei Cai, Rongkai Zhao and Tian Peng</i>	
Study on Surface Crack Closure Behavior of Ship Hull Plate Structures under Constant and Variable Amplitude Low-	

Cycle Fatigue Loading.....	471
<i>Wenlong Rong, Junlin Deng, Shourong Lai, Haoyue Ming and Chuannao Deng</i>	
Study on the Performance Impact of Large Deformation on Mobile Wellhead Platform 163.....	477
<i>Zhenguo Tang, Zhanbin Meng, Han Liu, Dongbin Yang and Ruizhu Wu</i>	
Wind Power Prediction based on Multivariate and Convolutional Neural Network Fast Deep Stacked Network Extreme Learning Machine.....	483
<i>Junyang Xu, Qiwei Zhang, Yuexin Liu, Xuefeng Wang and Chu Zhang</i>	
<b>Author Index.....</b>	<b>491</b>