2024 International Conference on Advanced Control Systems and Automation Technologies (ACSAT 2024)

Nanjing, China 15-17 November 2024



IEEE Catalog Number: CFP24VY6-POD **ISBN:**

979-8-3315-4167-5

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:	CFP24VY6-POD
ISBN (Print-On-Demand):	979-8-3315-4167-5
ISBN (Online):	979-8-3315-4166-8

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

A novel Artificial Vulture Optimization Algorithm and its application on the aluminum smelting furnace temperature prediction system	1
Jiayang Dai, Hangbin Liu, Yason Luo, Peirun Ling, Haofan Shi	
Design and experimental research of an underwater respiratory monitoring device	ſ
Letian Tang, Guang Liu, Pei Hu, Rukun Wu	6
Design of Portable On-line ECG Monitor	10
Weiwei Lyu, Yingli Wang, Yunbiao Jin, Qingjun Zeng	12
Electro-hydraulic position synchronous servo system based on adaptive sliding mode control	16
Yuchao Wang, Yuanxun Fan, Yi Wang	
The application of online monitoring technology in the structural safety monitoring of the runner chamber	22
Zhanling Wang, Tianliang Zhao, Zifeng Zhao, Junchao Xi	
A Model for Completing The Transformer-user Linked Data Based on Variational Autoencoder and Generative Adversarial Networks	26
Chao Ma, Meng Liu, Han Liu, Hao Xu, Cong Wang, Jiaxin Yan	
Dynamic Inertia Weight and Learning Factor Enhanced Particle Swarm Optimization for Optimal and Coordinated Economic Dispatch of Interconnected Multi-Microgrid Systems	31
Yansong Mei, Tianguang Lu, Yuhao Zhang, Shaocong Wu, Qinzheng Wu, Yingdong Xu	
Computational analysis of Mechanical Vapor Compression (MVC) distillation system	36
Qing Huo, Cong Liu, Rouman Li, Weiqi Liu	
Design and Implementation of an Agricultural Logistics Control System Based on IoT Techology	40
Pengyu Sun, Zhiquan Zhang	
Signal Generator Based Prescribed-Time Anti-Disturbance Containment Control for Multi-agent Systems with An Application to Multiple Manipulator System	44
Chen Zhang, Mingfeng Guan, Guangming Zhang	
Design of Autonomous and Precise Landing Tracking Algorithm for Multi Rotor Unmanned Aerial Vehicles	49
Fei Xiong, Bo Zhang, Zaifeng Li, Wei Ding, Xu Liu, Yixin Lu	
Extrinsic Calibration Method for LiDAR and Millimeter-Wave Radar Systems	53
Yanping Yang, Mingwu Ren	55

Research on The Two-parameter Joint Control System of Plasma Discharge Cavity Based on Adaptive PID	60
Hao Li, Fan Lei, Hui Zhou, Zhiwei Liu	
Research of Multi-channel Digital Filters Based on DSP	<i>(</i>)
Gang Huang, Zhiyuan Gao	64
Load forecasting of port multi-energy fusion power system based on improved FFT and ConvMLP-GRU	68
Dianqiang Zhou, Xujing Tang, Wei Guo, Tian Wang	
Design of Intelligent Guide Car	70
Jinhao Tan, Jincan Li, Zekai Chen, Jiahui Li	76
Industrial Robot Control System Integration Design and Application	0.1
Yan Chen, Xingwen Gu, Yushuai Wang, Lianchong Ling	81
Design for Safe Handling Disposal of the Lithium Waste Power Batteries in a Disassembly Line using Control System Equipped with Machine learning	0.5
Weichao Tan, Celso Bation ,Co, Rowell M.Hernandez, Jeffrey Sarmiento, Cristina Amor Rosales	85
Evolution and Challenges of the New-Type Power System: Transformation under the Carbon Neutrality Goal	91
Tengyan Wang, Nige Li, Lu Chen, Mu Chen	
Safety Analysis and Control Strategy of Shunting Operation in Metro Depot	05
Qi Wang, Xiujuan Yu, Yitong Chen	95
Forming temperature field Prediction of extrusion products based on spatiotemporal separation modeling	99
Zhehui Yan, Sheng Qin, Min Chen, Liping Wu, Xiaobo Wang, Yingshi Zhou	
Frequency measurement method of vibrating wire sensor in complex noise environment	102
Boyun Jing, Xiangan Wang, Yonghong Li, Yanping Liu, Jun Zou, Xiaobing Luo, Feilong Liu, Guiping Li	103
Research on the influence of temperature control uniformity in thermal vacuum test of high-power supply products	107
Tianli Hui, Xiaoyan Guo, Wenjing Song, Ning Ma, Yujun Bai, Haiqing Lv, Jialin Liu, Xin Tian, Chao Ran, Xiaojun Tang	107
The Mechanic and Application of Flexible Auxiliary Support under Assembly Pre- Tightening Process	111
Dekun Chen, Hongqiang Liao, Junwei Liu, Yunbin Yang, Zhou Huang	

Study on the Stage Electric Response Characteristics of Electrically Controlled Solid Propellants	116
Men Li, Tianpeng Li, Xinbao Gao	110
Nonlinear Control of Electro-Hydraulic Servo Systems under Variable Load Conditions	120
Haoran Liu, Junjie Mi, Weilin Zhu, Jianyong Yao	
Design of a Trajectory Tracking Controller for Underactuated Unmanned Surface Vessels Based on the Backstepping Method	127
Fengying Ma, Xinming Chen, Peng Ji, Guangxin Luo, Wanlong Dong	
Application of Neural Network Model Considering Chaotic Vibration of Traction Gears in Locomotive Adhesion Optimization Control	132
Caizhou Dai, Ningzhou Li, Xiaojuan Wei	
Research on Sensorless Control Based on Adaptive Sliding Mode Control	137
Rang Yang, Yi Hu	137
Design and analysis of flood prevention and sealing device at the entrance of GCB room of hydropower station	143
Jin Yang, Chengshan Li, Tao Tian, Yuanxun Liu, Qingshu Wang, Rui Wang, Mengmeng Liu	143
Distance-based formation control for wheeled mobile robots with prescribed performance	148
Guopeng Wang, Wen Qin, Lei Chen	
UAV Flight Phase Recognition and Decision Control Based on Attitude Angle Information	152
Peiyu Xing, Zhanwen Xi	
Forging Production Line Simulation Based on RobotStudio	150
Xueyan Jiao, Qingsong Zhu	158
Research on bearing surface defect detection based on CBAM and BN	163
Zigui Liu, Felicito Caluyo, Rowell Hernandez, Jeffrey Sarmiento, Cristina Amor Rosales	105
Control of a single-leg robot Based on Closed-Loop PD-Type Iterative Learning and Neural Network	170
Han Yang, Yongkang Din, Qingyu Liu, Hongkang Zhang	
The Utilization of Deep Learning Technology in the Detection of Laser Welding Defects	178
Shaowei Shi, Felicito Caluyo, Rowell Hernandez, Jeffrey Sarmiento, Cristina Amor Rosales	
Research on cycle life prediction model of electronic bonding structure based on Anand equation	182
Guoyong Zhang	

Research on the Control Characteristics of Three Types of Coil type Electromagnetic Launcher	187
Junjie Liu, Jianming Shi, Bolin Cai	
Adaptive Motion Control and Structural Design of a Spherical Robot Based on Feature Modeling	195
Yawen Yang, Bishuang Fan, Hongsen Duan, Chong Jiang	
Electromagnetic Simulation of A Self-Excited Oscillation Fluxgate Current Sensor Based On ANSYS	202
Xiang Min, Xiang Li, Huihui Feng	
Improved direct torque control based on permanent magnet synchronous motor	207
Xiongchao Yang, Yun Lv	207
A Robust In-Motion Alignment Method for GNSS-aided SINS Based on Multiple Backtracking	212
Fanlong Meng, Weiwei Lyu	
An automated security policy generation method based on rule-matching and machine-learning models	217
Yue Wu, Ruixia Lang, Hao Yang, Xiangze Li	
Research on integrated technology of synthetic biology automated platform	221
Sidi Li, Cui Ma, Fan Yang, Shu Chen, Kai He	221
Comprehensive Measurement Method of Intelligent Level of Measurement and Control Equipment Based on Kinetic Entropy	229
Jing Sun, Lijiao Niu, Xiujian Zhang	
A Method for Detecting Abnormal Datas of Transfomer-Users Based on Deep Learning	234
Chao Ma, Han Liu, Bintai Xu, Wenbin Zhang, Yongzhe Liu, Fading Pan	
A New MRACS Approach for High-order System Following Low-order Model Using State Variables Taking from the Model	238
Yongdong Wei, Xiaojing Liu, Jiayi Kong, Zixuan Cheng, Wen Fang	
D265-12 Diesel engine piston and cylinder liner percussion noise calculation and analysis	242
Juli Zheng, Xiujuan Zhang, Xinlin Zhang, Zhiqiang Chen	
A Rainy Day Object Detection Method Based on YOLOv11 Combined with FFT and MF Model Fusion	246
Jin Yang, Tao Tian, Yuanxun Liu, Chengshan Li, Dingping Wu, Lin Wang, Xiancheng Wang	246
An improved HTNet micro-expression recognition method	251
Liyan Zhang, Jiayan Li, Shuang Chen, Jiaxin Du, Zhongyue Zheng	251

UAV Obstacle Avoidance Path Planning Based on Improved Artificial Potential Field Method	255
Mingrui Li, Ligang Quan, Qiaosong Li, Da Li, Zaifeng Li, Wei Ding	
Dual-UAVs Collaborative Target Localization and Configuration Optimization	250
Zekai Zhao, Cheng Xu	259
Text Classification Method Based on Approximate Nearest Neighbor Enhanced Contrastive Learning and Attention Mechanism	266
Lai Qian, Weiwei Zhao, Qianqian Chen, Jiaxu Chen	
Principle and Parameter Setting Method of PSS2B Model of IEEE	
Xince Zhao, Jiapeng Cui, Xinghua Mu, Huaiyu Guo, Bowen Gu, Zhipeng Liu, Changlong Zhao, Chen Yang	275
Artificial Intelligence-based Interference Signal Recognition for Satellite Communications	279
Xiaoyu Han	
A Signal Denoising Method for Pulsed Eddy Current Testing Based on Parameter Optimization of VMD Combined with Wavelet Threshold	283
Tianyu Wu, Siquan Zhang	
Multi-energy storage participates in the peak regulation auxiliary service of the power market	291
Wenyuan Qiao, Chenxu Zhao	
Research on Evaluation Method of Transmission Line Tower Grounding Device Based on K-Means Algorithm	296
Zengchao Liu, Feilong Cheng, Wei Wang	
Wind Power Prediction with Ramp Events Detection Based on Multi-layers Architecture	300
Xuemeng Wang, Ying Han	
Medium-term Prediction of PV Power based on PConv-Informer Modeling Method	
Xinggang Hu, Ying Han	304
Model-Driven Behavioral Modeling and Verification Methods for Human-Machine Hybrid Intelligent Systems	308
Yuanfa Dong, Yuxin Zeng, Wenli Zhang, Bin Zhou	
Author Index	315