

2022 International Conference on 3D Immersion, Interaction and Multi-sensory Experiences (ICDIIME 2022)

**Madrid, Spain
27 – 29 June 2022**



**IEEE Catalog Number: CFP22CV4-POD
ISBN: 978-1-6654-9010-8**

**Copyright © 2022 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:	CFP22CV4-POD
ISBN (Print-On-Demand):	978-1-6654-9010-8
ISBN (Online):	978-1-6654-9009-2

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

CURRAN ASSOCIATES INC.
proceedings
.com

2022 International Conference on 3D Immersion, Interaction and Multi-sensory Experiences (ICDIIME) **ICDIIME 2022**

Table of Contents

Message from the General Chairs	x
Organizing Committee	xi
Reviewers	xii

ICDIIME 2022

Research into Digital Sculpture Technology Based on Artificial Intelligence	1
<i>Peng Li (Xiangnan University, China), Dengpan Jiang (Xiangnan University, China), and Hui Xie (Xiangnan University, China)</i>	
Class D Power Amplifier Based on Waveform Predistortion Technology	6
<i>Congcong Li (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Yanjie Dai (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Hongxia Zhu (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Zhen Jing (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Qing Wang (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Pingxin Wang (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), Chao Yu (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China), and Tingting Wang (State Grid Shandong Electric Power Company Marketing Service Center (Metrology Center), China)</i>	
Image Target Detection Algorithm Based on Computer Vision Technology	10
<i>Haidi Yuan (Basic Experiment Teaching Center of Anhui Sanlian College, China)</i>	
Image Recognition Algorithm Based on Deep Learning	14
<i>Jiashan Zhu (Qujing Power Supply Bureau of Yunnan Power Grid Co. Ltd., China)</i>	
Improvement of Attribute Reduction Classification Algorithm Based on Rough Sets	18
<i>Conghua Lan (Lanzhou Institute of Technology, China)</i>	

Research on Ink Speed Recognition Method of Hyperspectral Imaging Ink Pad Based on Machine Learning	22
<i>Shangpeng Yang (Criminal Investigation Police University of China, China)</i>	
A Study on the Collision of Artificial Intelligence and Art Based on Generative Adversarial Networks (GAN)	27
<i>Shaoyi Guo (Shenyang Jianzhu University, China), Yaxian Wang (Chaoyang Quality Education Practice School for Primary and Secondary Schools, China), and Wei Yang (Graduate School of Shenyang Ligong University, China)</i>	
An Information Fusion Technology for Statistical Analysis of Computer Professional Certificates	32
<i>Jianlai Liao (Dongguan Nanbo Vocational and Technical School, China), Bo Li (Dongguan Nanbo Vocational and Technical School, China), and Zhiyue Ren (Dongguan Nanbo Vocational and Technical School, China)</i>	
Application of Big Data Processing Technology in Power Marketing System	36
<i>Chennan Zhou (Guangdong Electric Power Information Technology Co., Ltd., China), Rixin Zhuang (Guangdong Electric Power Information Technology Co., Ltd., China), and Fei Chen (Guangdong Electric Power Information Technology Co., Ltd., China)</i>	
The Fault Diagnosis Method Based on Fuzzy Neural Network	40
<i>Junzhe Dong (Xidian University, China)</i>	
The Fuzzy Control Method Based on Dynamic Self-Optimization	44
<i>Kun Han (National University of Defense Technology, China), Tongfei Shang (National University of Defense Technology, China), and Mingming Zhang (Unit 32707, China)</i>	
Solid-Fluid Interaction Simulation System Based on SPH Unified Particle Framework	48
<i>Xuqiang Shao (North China Electric Power University, China), Xin Zhang (North China Electric Power University, China), Shihe Yang (North China Electric Power University, China), and Yizhong Jin (North China Electric Power University, China)</i>	
Design and Research of Distributed Web Crawler Based on Knowledge Graph	55
<i>Xiaohu Liu (College of Xinyu, China)</i>	
Research on Distributed Energy Virtual Power Plant Based on Spatial Prediction Model	60
<i>Wenjing Zu (State Grid Henan Electric Power Company, China), Peng Li (State Grid Henan Electric Power Company, China), Shiqian Wang (State Grid Henan Electric Power Company, China), Huixuan Li (State Grid Henan Electric Power Company, China), Yihan Zhang (State Grid Henan Electric Power Company, China), Hongkai Zhang (State Grid Henan Electric Power Company, China), and Yida Du (North China Electric Power University, China)</i>	
Research into Digital Oil Painting Restoration Algorithm Based on Image Acquisition Technology	65
<i>Dengpan Jiang (Xiangnan University, China), Peng Li (Xiangnan University, China), and Hui Xie (Xiangnan University, China)</i>	

Text Classification in Architecture Field Based on Naive Bayes Algorithm	69
<i>Xinyi Sun (Shenyang Jianzhu University, China), Liming Du (Shenyang Jianzhu University, China), and Yanshuang Wang (Shenyang Jianzhu University, China)</i>	
Data Processing in CPSS Platform Based on Data Mining and Cloud Edge Computing	73
<i>Haimin Sun (Luxun Academy of Fine Arts, China), Mengcan Sun (Luxun Academy of Fine Arts, China), and Lu Zhao (Luxun Academy of Fine Arts, China)</i>	
Research on Remote Sensing Images Clarification Algorithm Based on Grid Technology	79
<i>Rongchun Wu (Officers College of Chinese People's Armed Police Force, China)</i>	
Fast Adaptive Machine Vision Positioning Algorithm Based on Relative Threshold Features	85
<i>Kai Zheng (Xi'an Transportation Engineering College, China)</i>	
A Design of Turnout Health Monitoring Algorithm and System	89
<i>Dong Wang (He'an Highspeed Rail CO., Ltd., China), Yong Xia (He'an Highspeed Rail CO., Ltd., China), Hongtao Wang (Anhui Comprehensive Transportation Research Institute CO., Ltd, China), and Feixiang Wang (Anhui Comprehensive Transportation Research Institute CO., Ltd, China)</i>	
Design and Implementation of Image Relief Based on Computer 3D Modeling	94
<i>Han Chi (Minjiang University, China)</i>	
Modeling and Analysis of Video Image Target Detection (TD) and Tracking Based on Deep Learning	99
<i>Zhaosheng Xu (Xinyu University, China)</i>	
Improved Human-Object Interaction Based Lightweight Openpose	104
<i>Hanmin Yang (School of Engineering, Guangzhou College of Technology and Business, China), Qingyuan Liu (School of Engineering, Guangzhou College of Technology and Business, China), and Jiali Zhang (School of Engineering, Guangzhou College of Technology and Business, China)</i>	
Face Recognition Method Based on Adaptive Feature Fusion	108
<i>Pengfei Yan (Harbin Engineering University, China) and Zhongmin Zhang (Harbin Engineering University, China)</i>	
Improving the Bag-of-Words Model using the Hubness Phenomenon for Skeleton-Based Action Recognition	112
<i>Leilei Chen (Shanghai Open University, China), Xinjie Duan (Mechanical and Electrical Engineering, Shanghai Normal University, China), and Yan Ma (Mechanical and Electrical Engineering, Shanghai Normal University, China)</i>	
Research into Oil Painting Recognition and Analysis System Based on Image Intelligent Algorithm	117
<i>Zhihua Kuang (Xiangnan University, China) and Peng Li (Xiangnan University, China)</i>	
Design and Application of Current Situation Network Survey System for Female Science and Technology Workers Based on J2EE	121
<i>Yang Wang (Bohai University, China)</i>	

Research on Online on-Demand Platform of Piano Repertoire Based on Streaming Media Technology	125
<i>Heda Zhang (Bohai University, China)</i>	
Research on Integrated Management Platform of Sports Service Industry Based on WebGIS	130
<i>Wen Jing (Bohai University, China) and Yang Li (Bohai University, China)</i>	
Research on Table Tennis Training Plan Management System Based on SSM Framework	135
<i>Jun Li (Bohai University, China)</i>	
Adaptive Assessment Method of High Voltage Power Metering Operation Process Based on Information Fusion in VR Training	139
<i>Miao Jin (China Electric Power Research Institute, China), Jun Zhang (China Electric Power Research Institute, China), Guoshu Lai (Marketing Service Center of State Grid Fujian Electric Power Co., Ltd., China), Zhiwei Guo (Marketing Service Center of State Grid Fujian Electric Power Co., Ltd., China), Tianfu Huang (Marketing Service Center of State Grid Fujian Electric Power Co., Ltd., China), Wenxi Chen (China Electric Power Research Institute, China), Quan Wang (China Electric Power Research Institute, China), Wei Zhou (China Electric Power Research Institute, China), and Jiliang Fu (China Electric Power Research Institute, China)</i>	
Research on 3D Face Recognition Technology Based on Multi Feature Fusion from the Perspective of Aesthetics	143
<i>Yan Fu (Institute of Psychology of the Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Chunlei Fan (Institute of Psychology of the Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Ligang Wang (Institute of Psychology of the Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), Ting Tao (Institute of Psychology of the Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China), and Wenbin Gao (Institute of Psychology of the Chinese Academy of Sciences, China; University of Chinese Academy of Sciences, China)</i>	
On the Use of LSTM-RNN for Detecting Audio Spoofing Attacks	147
<i>Lian Huang (Guangdong Mechanical & Electrical College, China) and Jinhong Zhao (Guangdong Mechanical & Electrical College, China)</i>	
Research and Implementation of Coronary Artery Segmentation Algorithm Based on Deep Learning	151
<i>Shoujin Wang (Shenyang Jianzhu University, China) and Huailiang Xie (Shenyang Jianzhu University, China)</i>	
Research of Visual SLAM in Dynamic Environment using Convolutional Neural Network	157
<i>Feng Zhang (Shenyang Jianzhu University, China), Mingzhi Sun (Shenyang Jianzhu University, China), Shuai Yuan (Shenyang Jianzhu University, China), and Weiliang Wang (Shenyang Jianzhu University, China)</i>	
Research on Non-Contact Surface Deformation Monitoring System Based on UWB Positioning	163
<i>Yang Li (Institute of Exploration Technology, CAGS, China), Jianhui Dong (College of Architecture and Civil Engineering, Chengdu University, China), Zhenxing Ren (College of Mechanical Engineering, Chengdu University, China), and Junrui Pei (Chinese Academy of Geological Sciences, China)</i>	

Design and Realization of Financial Accounting Reporting System Based on Computer Software... <i>Jin Lu (Kunming Metallurgy College, China)</i>	167
An Improved Threshold Image Separation Algorithm <i>Yunhong Zhao (Jingchu University of Technology, China), Suruo Li (Jingchu University of Technology, China), and Yuhua Xu (Nanjing Audit University, China)</i>	171
Research on the Maximum Coverage Algorithm of Airship Monitoring System <i>Sijin Xiong (Northwest Institute of Nuclear Technology, China), Wei Tao (Northwest Institute of Nuclear Technology, China), Xiaojun Meng (Northwest Institute of Nuclear Technology, China), Huidong Huangfu (Northwest Institute of Nuclear Technology, China), Jiachen Shen (Northwest Institute of Nuclear Technology, China), Jianhua Zhang (Northwest Institute of Nuclear Technology, China), Jianglong Zhou (Northwest Institute of Nuclear Technology, China), Peng Zhang (Northwest Institute of Nuclear Technology, China), Kang Su (Northwest Institute of Nuclear Technology, China), Haoran Tang (Northwest Institute of Nuclear Technology, China), Ying Zang (Northwest Institute of Nuclear Technology, China), Haiyan Chen (Northwest Institute of Nuclear Technology, China), and Rongxin Chen (Northwest Institute of Nuclear Technology, China)</i>	175
Author Index	181