

2022 International Conference on Cloud Computing, Big Data Applications and Software Engineering (CBASE 2022)

**Suzhou, China
23 – 25 September 2022**



**IEEE Catalog Number: CFP22DL8-POD
ISBN: 979-8-3503-9640-9**

**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:	CFP22DL8-POD
ISBN (Print-On-Demand):	979-8-3503-9640-9
ISBN (Online):	979-8-3503-9639-3

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

CURRAN ASSOCIATES INC.
proceedings
.com

2022 International Conference on Cloud Computing, Big Data Applications and Software Engineering (CBASE) **CBASE 2022**

Table of Contents

Preface	xii
Conference Committee	xiii

Software Engineering Development and Programming

Research and Design of LIMS in the Field of Metal Deep Processing	1
<i>Bin Jia (Xi'an Eurasia University, China), Hongfei Hu (Xi'an Eurasia University, China), Na Li (Xi'an Eurasia University, China), and Ping Zhang (Xi'an Eurasia University, China)</i>	
Research on the Influence of Managerial Overconfidence on Performance Commitment	5
<i>Shiyue Li (Lanzhou University of Technology, China)</i>	
Evaluating the Impact of Residents' Income on Residents' Consumption Based on MATLAB	9
<i>Meichi Ge (Northeast Yucai Foreign Language School, China) and Wanbing Yu (Northeast Yucai Foreign Language School, China)</i>	
A Graphical Display Method for Low Performance Embedded Systems Based on Hybrid Programming and Double Buffering Technology	14
<i>Hongfei Hu (Xi'an Eurasia University, China), Yongheng Liu (Peng Cheng Lab, China), Yimei Xu (Xi'an Eurasia University, China), and Weinan Chen (Xi'an Eurasia University, China)</i>	
Software Dependability Evaluation Method for the Whole Life-Cycle	18
<i>Weixin Wu (Jinan University, China), Chaonan Wang (Jinan University, China), Chunhui Yang (China Electronic Product Reliability & Environmental Testing Research Institute, China), and Min Yu (China Electronic Product Reliability & Environmental Testing Research Institute, China)</i>	
Research on Data Storage Mode and Storage Access Interface Design of TSDA Server	23
<i>Zhengrui Peng (Electric Power Research Institute of State Grid Shanghai Electric Power Company, China), Xiangyi Xu (Electric Power Research Institute of State Grid Shanghai Electric Power Company, China), and Xin Wan (Shanghai EnergyFuture Co., Ltd, China)</i>	

Interactive Image-Space Rendering of Dispersions	27
<i>Yuanmeng Luo (Jiangnan university, China)</i>	
The Design and Implementation of Criminal Investigation Simulation Training System Based on VR Technology	32
<i>Hong Zhou (Sichuan Judicial And Police Officers Peofessional College, Sichuan) and Yipeng Yang (Sichuan Judicial And Police Officers Peofessional College, Sichuan)</i>	
Dynamic Community Detection in Weighted Graph Stream	36
<i>Jiarui Wang (University of British Columbia, Canada)</i>	
The Advance and Analysis of Memory Allocations	45
<i>Pengyu Ren (Huazhong University of Science and Technology, China)</i>	
Network Security Protection System for Energy Monitoring System Based on Commercial Cryptography	49
<i>Sihang Yu (State Grid Fujian Electric Power Research Institute, China), Zhiguang Xu (State Grid Fujian Electric Power Company, China), Chaoping Deng (State Grid Fujian Electric Power Research Institute, China), Guodong Lin (State Grid Fujian Electric Power Research Institute, China), Jinshan Chen (State Grid Fujian Electric Power Research Institute, China), and Zhaoxiang Li (State Grid Fujian Electric Power Research Institute, China)</i>	
Design and Implementation of English Reading Online Examination System	54
<i>Yan Liu (Jingchu University of Technology)</i>	
Splicing All Possible Convex and Non-Convex Pentagons with Tangram Using DFS	60
<i>Shixu Li (Macau University of Science and Technology, China)</i>	
Construction of an Evaluation Index System for Digital Transformation Maturity of Energy Industry Based on Analytic Hierarchy Process	65
<i>Yingchun Yang (State Grid Sichuan Electric Power Company, China), Fuxin Li (State Grid Sichuan Electric Power Company, China), Houdong Xu (State Grid Sichuan Electric Power Company, China), Yuhan Dai (State Grid Sichuan Electric Power Company, China), Yu Zhang (Beijing SGITG-Accenture Information Technology Co., Ltd., China), and Tianguang Yang (Beijing SGITG-Accenture Information Technology Co., Ltd, China)</i>	
DynaMo Analyzation: Dynamic Community Detection by Incrementally Maximizing Modularity Analyzation	73
<i>Shibo Jin (The University of British Columbia, Canada)</i>	
Attention-Aware CNN Model for Traffic Signs Classification	83
<i>Xiangsheng Gu (University of California, USA), Qiuyi Lang (Queen's University Belfast, UK), Fu Lin (York University, Canada), and Pengfei Wang (Dalian University of Technology, China)</i>	
Task Scheduling Strategy in the Cloud Based on Cauchy Chaotic Harris Hawk Optimization	88
<i>Hao Wang (Shandong University of science and technology, China), Yaoxin Li (Shandong University of science and technology, China), and Yunshen Ma (Shandong University of science and technology, China)</i>	

The Elaboration and Further Improvements of PageRank	92
<i>Victor Leonardo Wang (High School Affiliated to Renmin Univ of China), Yingchao Tang (High School Affiliated to Renmin Univ of China), Justin Guo (High School Affiliated to Renmin Univ of China), and Xinrui Bao (High School Affiliated to Renmin Univ of China)</i>	
Defect Detection of Printed Matter Based on LSTM Progressive Residual Network	99
<i>Weidong Du (Southeast University, China), Long Lin (Changzhou University, China), Zihao Xin (Changzhou University, China), and Hongyuan Wang (Changzhou University, China)</i>	

System Security Testing and Big Data Analysis

Literature Image Visualization Processing and Data Analysis of the Theoretical Research on "middle School Chorus" Since the Founding of New China from the Perspective of Big Data	105
<i>Wen Shi (Experiment Juninor Middle School, China), Wu Jiang (Experiment Juninor Middle School, China), and Li Ze (Experiment Juninor Middle School, China)</i>	
Analysis on the Research of Database Programming Technology in Computer Software Engineering	111
<i>Kaixin Su (Xiamen University of Technology)</i>	
Research on Quantum Secure Route Model and Line Model Image Encryption Technology Based on Big Data Technology	115
<i>Lian Tong (Jiangsu Maritime Institute, China), Pingping Xia (Jiangsu Maritime Institute, China), and Taizhi Lv (Jiangsu Maritime Institute, China)</i>	
2D Robots Navigation System with Narrow Gap Problems	119
<i>Zixuan Zhou (Shanghai Starriver Bilingual School, China)</i>	
Analytics on the Cloud – Inner Melbourne	124
<i>Ziyan Zhao (Zhejiang University, China), Wanqi Geng (University of Melbourne, Australia), Xuesen Li (University of Melbourne, Australia), Dewei Yu (University of Melbourne, Australia), Xuan Zhou (University of Melbourne, Australia), and Wei Zhang (Zhejiang University, China)</i>	
Construction and Effectiveness of Engineering Financial Archives Management Informatization Based on the Integration of Industry and Finance	132
<i>Yajie Zhou (State Grid Hubei Extra High Voltage Company, China) and Xiang Song (State Grid Hubei Extra High Voltage Company, China)</i>	
A Frequent Subgraph Publishing Algorithm Based on Differential Privacy	136
<i>Wenfeng Liu (Guilin University of Electronic Technology, China), Di Chen (Guilin University of Electronic Technology, China), MingHao Yu (Guilin University of Electronic Technology, China), and Qiang Xu (Guilin University of Electronic Technology, China)</i>	
Design of a Digital Service Platform for College Student Employment Based on Big Data Analysis	142
<i>Na Li (Xi'an Eurasia University, China), Xin Liu (Xi'an Eurasia University, China), Hongfei Hu (Xi'an Eurasia University, China), and Bin Jia (Xi'an Eurasia University, China)</i>	

Research on Encryption Protection Method of Quantum Security Computer	147
<i>Lian Tong (Jiangsu Maritime Institute, China), Taizhi Lv (Jiangsu Maritime Institute, China), and Pingping Xia (Jiangsu Maritime Institute, China)</i>	
Research on the Application of Data Mining Technology in Enterprise Supply Chain Management System	151
<i>Chuanlu Huang (Jiangxi Information Application Vocational and Technical College, China), Lingyun Luo (Jiangxi Information Application Vocational and Technical College, China), and Yu Nie (Jingdezhen Ceramic University)</i>	
Research on the Value and Application of Power Big Data in External Value-Added Services	155
<i>ZhengXiong Mao (Information center of Yunnan Power Grid Co., Ltd, China), Hui Li (Information center of Yunnan Power Grid Co., Ltd, China), ZuYuan Huang (Information center of Yunnan Power Grid Co., Ltd, China), Yuan Tian (Information center of Yunnan Power Grid Co., Ltd, China), XiaoPing Zhao (Information center of Yunnan Power Grid Co., Ltd, China), and Hang Zhang (Information center of Yunnan Power Grid Co., Ltd, China)</i>	
Research on the Informatization of Teaching Management in the era of Big Data	160
<i>Kangkang Zheng (Hohai University, China)</i>	
The Impact of Big Data on Microeconomic Activities and the Challenges it Faces	164
<i>Haonan Yao (Guangzhou Yudlai International School)</i>	
A CP-ABE Method Base on Reused sub-Policy	168
<i>Qingqing Huang (School of Computing of Neusoft Institute Guangdong, China)</i>	
Attention-Based CNN Model for Traffic Sign Recognition	174
<i>Yaozhen Chen (Faculty of Computer Science, Dalhousie University, Canada), Han Qu (The University of Sheffield, United Kingdom), Zicheng Wang (Faculty of Computer Science, Dalhousie University, Canada), and Chengpeng Xiong (Stony Brook University, United Kingdom)</i>	
Mean Estimation of Multidimensional Numerical Data with Local Differential Privacy	180
<i>Yunshen Ma (Shandong University of science and technology, China), Huixin Xu (Shandong University of science and technology, China), Yue Zhang (Shandong University of science and technology, China), and Hao Wang (Shandong University of science and technology, China)</i>	
Driving Behavior Index Extraction Based on ViCANdo	185
<i>Jinjing Zhang (Shanghai DianJi University, China) and Bin Liu (Shanghai DianJi University, China)</i>	
Traffic Zone Division Method Based on Spatial Constraint Clustering	189
<i>Binbin Feng (Zhengzhou University, China), Hongwei Li (Zhengzhou University, China), and Yirui Jiang (Zhengzhou University, China)</i>	
A Pedestrian Detection Method Based on Improved YOLOv5s	197
<i>Xingxing Zhang (Zhengzhou University, China), Huawei Song (Zhengzhou University, China), Fangjie Wan (Zhengzhou University, China), and Xin Yang (Zhengzhou University, China)</i>	

Bayesian Optimization for Robust Engineering Design with Noise Factors	202
<i>Ying Chen (Nanjing University of Aeronautics and Astronautics, China)</i>	
<i>and Mei Han (Nanjing University of Aeronautics and Astronautics, China)</i>	

Intelligent Algorithms and Neural Network Modelling

Research on Supply Chain Big Data Management Based on Machine Learning Algorithms	207
<i>Likun Ye (South China University of Technology, China)</i>	
Analysis of Intelligent Application Technology of Rule of law in the era of Wisdom of law	214
<i>Haitao Tu (Beijing Guodiantong Network Technology Co., LTD., China)</i>	
<i>and Wang Cong (Beijing Guodiantong Network Technology Co., LTD., China)</i>	
Realization of Real Estate Market Early Warning System Based on Neural Network	220
<i>Bing Du (ShenYang JianZhu University, China) and Haiying Li (ShenYang JianZhu University, China)</i>	
Implementation and Effectiveness Evaluation of Four Common Algorithms of Recommendation Systems - User Collaboration Filter, Item-Based Collaborative Filtering, Matrix Factorization and Neural Collaborative Filtering	224
<i>Hongjiao Liu (University of Tasmania, Australia)</i>	
Prediction of Sunburn in Power Grid Workers Using Machine Learning Models	228
<i>Quanquan Gong (State Grid Shandong Electric Power Company Electric Power Research Institute, China), Lianke Xie (State Grid Shandong Electric Power Company Electric Power Research Institute, China), Dandan Dou (State Grid Shandong Electric Power Company Electric Power Research Institute, China), Kun Wang (State Grid Shandong Electric Power Company Electric Power Research Institute, China), and Guoying Zhang (State Grid Shandong Electric Power Company Electric Power Research Institute, China)</i>	
Big Data Collaborative Artificial Intelligence and High-Performance Computing to Drive Physical Design of Fusion	232
<i>Pan Liu (Tianfu Innovation Energy Establishment, China; Beijng PARATERA Technology corp., Ltd, China; National University of Defense Technology, China;), Gongjie Liu (Beijng PARATERA Technology corp., Ltd, China), Jie Liu (National University of Defense Technology, China), Chencheng Liu (Central South University of Forestry and Technology, China), Wenbin Xiong (Nuclear and Radiation Safety Center, China), Zhangcun Tang (University of Electronic Science and Technology of China, China), Yinzhao Zhou (Tianfu Innovation Energy Establishment, China), Yonggang Wang (Tianfu Innovation Energy Establishment, China), and Zhouming Yuan (Tianfu Innovation Energy Establishment, China)</i>	

Research on Insulator Recognition Algorithm Based on Deep Learning	237
<i>Fan Kuang (Dongguan Power Supply Bureau of Guangdong Power Grid Corporation, China), Jianhua Cui (Dongguan Power Supply Bureau of Guangdong Power Grid Corporation, China), Xiliang Dai (Dongguan Power Supply Bureau of Guangdong Power Grid Corporation, China), and Cheng Zhang (Dongguan Power Supply Bureau of Guangdong Power Grid Corporation, China)</i>	
Ship Route Planning Method Based on Optimized A-Star Algorithm	242
<i>Yangchong Cao (Dalian Maritime University, China), Yaoliang Huang (Dalian Maritime University, China), and Zhihao Ma (Dalian Maritime University, China)</i>	
Research on Optimization of Traveling Salesman Problem Based on Differential Evolution Algorithm	246
<i>Xuemei You (Shandong Normal University, China), Man Zhang (Shandong Normal University, China), and Yangli Yu (Beijing University of Technology, China)</i>	
Abnormal Ship Route Detection Based on Quick-Bundles Clustering Algorithm	250
<i>Yining Zhu (Shanghai Maritime University, China) and Yingjie Xiao (Shanghai Maritime University, China)</i>	
Face Expression Recognition Based on Convolutional Neural Networks	254
<i>Xinpeng Zhang (Tianjin Polytechnic University, China)</i>	
Improved Hybrid Jaya Grey Wolf Optimization Algorithm	259
<i>Chu-Xin Wang (Beijing Jiaotong University, China), Zhi-Yuan Hu (Beijing Jiaotong University, China), Yun-Feng Chen (China Railway Lanzhou Group Co., Ltd., China), and Yuan-Jie Tang (Beijing Jiaotong University, China)</i>	
Implementation of Load Balancing Algorithm Based on Flink Cluster	264
<i>Kun Lang (The Thirty-second Institute of Chinese Electronic Technology Group Corporation) and Xiaoli Chai (The Thirty-second Institute of Chinese Electronic Technology Group Corporation)</i>	
An Intelligent Recommendation Model for Small Batch Gradient Descent Method	269
<i>Xiaoying Ye (Guangdong Neusoft Institute, China), Rong Tang (Chongqing Center for Disease Control and Prevention, China), and Xiaoyan Ye (Software Engineering Institute of Guangzhou, China)</i>	
Improved CharNet Text Recognition Algorithm Based on Multi-Layer Feature Mechanism	273
<i>Yuanyuan Zhang (China Datang Corporation Science and Technology General Research Institute Ltd., China), Dongnan Suo (Datang Northeast Electric Power Test & Research Institute, China), Fangfang Hou (China Datang Corporation Science and Technology General Research Institute Ltd., China), and Xueli Lei (China Datang Corporation Science and Technology General Research Institute Ltd., China)</i>	
An Enhanced Neural Network Model Based on VGG-16 for Accurate Recognition of Oracle	277
<i>Jiuxiang Gao (Xiamen University Malaysia, Malaysia)</i>	

A DDoS Attack Detection Method Based on Deep Learning two-Level Model CNN-LSTM in SDN Network	282
<i>Mengxue Li (Zhejiang Gongshang University, China), Binxin Zhang (Zhejiang Gongshang University, China), Guangchang Wang (UT Si Dakang communication limited company, China), Bin ZhuGe (Zhejiang Gongshang University, China), Xian Jiang (Zhejiang Gongshang University, China), and Ligang Dong (Zhejiang Gongshang University, China)</i>	
Chinese License Plate Recognition Using Attentional Mechanism in Neural Network Algorithm ...	288
<i>Haoshen Bai (Zhejiang Gongshang University, China), Zhenqing Fan (North China University of Technology, China), Yiwei Hong (University of Washington, Australia), and Zhanjie Peng (James Cook University, Australia)</i>	
Siamese Network with Feature Fusion for Visual Object Tracking	295
<i>Qiongrui Liu (Xi'an Jiaotong University, China), Xiyi Wang (University of Washington, USA), Wenjie Wu (Shanghai University, China), and Xilin Zhu (Tianjin Normal University, China)</i>	
Author Index	301