2021 20th International Symposium on Distributed **Computing and Applications for Business Engineering and Science** (DCABES 2021)

Nanning, China 10-12 December 2021



IEEE Catalog Number: CFP2120K-POD ISBN:

978-1-6654-2890-3

Copyright © 2021 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:
 CFP2120K-POD

 ISBN (Print-On-Demand):
 978-1-6654-2890-3

 ISBN (Online):
 978-1-6654-2889-7

ISSN: 2379-3724

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



2021 20th International Symposium on Distributed Computing and Applications for Business Engineering and Science (DCABES) DCABES 2021

Table of Contents

Preface
E-Business and Commerce
Modification Terms to the Black-Scholes Model Based on the Functional Volatility Model 1 Xiaozheng Lin (Fuzhou University, China), Wei Chen (Fuzhou University, China), Meiqing Wang (Fuzhou University, China), and Choi-Hong Lai (University of Greenwich, UK)
Empirical Research on the Impact of Margin Selling on the Volatility of China's Stock
Market
E-Commerce Service Equilibrium Prediction Simulation Based on Ontology
A Review on the Issues in Usability Evaluation of eHealth Applications: From a COVID-19 Pandemic Perspective
Bashair AlThani (Imam Abdulrahman Bin Faisal University, Saudi Arabia) Big Data and Data Mining
Political Economy Analysis of Carbon Emissions: Based on Empirical Data from the Central Region
Lipeng Wen (Guilin University of Electronic Science and Technology, China), Tingting Yin (Guilin University of Electronic Science and Technology, China), Xuemei Long (Guilin University of Electronic Science and Technology, China), and KengCheng Zheng (Zhongnan University of Economics and Law, China)
Digital Economy Has Become a New Engine for Regional Development

Analysis and Decision-Making of Regional Economic Vitality	
Research and Application of Community Pension Service Data Analysis System Based on Data Mining Algorithm	
Machine Learning Techniques to Predict Academic Performance of Health Sciences Students . 33 Hana Alharthi (Imam Abdulrahman Bin Faisal University, Saudi Arabia)	
Research Progress, Hot Spots and Prospects in the Field of Agricultural Innovation in China—CiteSpace Analysis Based on 2258 Articles	
Gender Classification for Online Shopping	
Mining Model of Purchase Intention Based on Support Vector Machine Algorithm	
A Study of the Influence of Different Opinion Leaders on the Evolution of Followers' Views in Social E-Commerce Networks	
Level-Based E-Government Cloud Cross-Domain Access Control Technology	
Intelligent Transportation	
Trajectory Tracking of Unmanned Vehicle Based on Improved Model Predictive Control 57 Miao Wang (Wuhan University of Technology, China), Yefu Wu (Wuhan University of Technology, China), and Fengyu Huang (Wuhan University of Technology, China)	
NDT-Based Robot Positioning System for Large Scale Diversity Environment	
Research on Detection Method of Abnormal Trajectory of Port Operation Vehicles	

Research on Model and Method of Inland River Ship Overload Measurement
Research on Path Planning Algorithm of Intelligent Wheeled Robot Based on ROS
Research on Scheduling Algorithm of Multi-AGVS System
Image and Vision Processing
Contourlet Transform Based Reduced-Reference Image Quality Assessment
Emotional Conversational Analytics—An Experimental Case Study
Application of Face Recognition in Port Unrestricted Scene
DP-Face: Privacy-Preserving Face Recognition Using Siamese Network
SSD Small Object Detection Algorithm Based on Feature Enhancement and Sample Selection 96
Zhipeng Liu (Jiangnan University, China), Wei Fang (Jiangnan University, China), and Jun Sun (Jiangnan University, China)
Application of CNN-Based Face Recognition Technology in Smart Logistics System
Multiscale Global Channel Network for Edge Detection
Classroom Monitoring System Based on Facial Expression Recognition
Research on Campus Physical Measurement System Based on CNN-LSTM

Campus Safety Monitoring System Based on Deep Learning
Algorithm Design and Implementation
Parallelization Implementation of Topographic Viewpoint Filtering Algorithm Based on Terrain Viewshed Using MPI and OpenMP
A Weight-Based Clustering Routing Algorithm for Ad Hoc Networks
A Railway Station Scheduling Algorithm Based on Multi-Objective Particle Swarm Optimization Algorithm
Recognition of Power Quality Disturbance Based on Artificial Bee Colony Algorithm to Optimize Kernel Extreme Learning Machine
Improved Yolov4-Tiny Algorithm Based on Cascade Residual Dilated Fusion
An Effective Lightweight Attention Mechanism
Traceability Method between Design Documents and Source Codes Based on SQL Dependence 144
Lujing Yu (Wuhan University of Technology, China), Yonghua Li (Wuhan University of Technology, China), Yuqing Feng (Wuhan Social Work Polytechnic, China), and Chen Qi (Chongqing Guoyuan Port Co., Ltd., China)
KTSP Solution Based on Workload Balance and Genetic
An Intelligent Identification and Detection Method for Forest Pests Based on YOLOv5s Algorithm

Improve the Performance of LSM-Tree Based on Key-Value via Multithreading
Quantile Regression Method of House Price Index for Newly Building Condominiums in China
A Hybrid ARIMA—ANN Model for Internet Food Safety Risks
Model Checking the Efficiency of Blockchain-Based Edge Computing Network
Development of Classroom Assistant Software Based on Mini Program
Research on Amazon Forest Fire Based on Cellular Automata Simulation
Improved BiLSTM Model for Online Food Safety Risk Prediction
Coefficient Optimization Based on Genetic Algorithm for Hybrid Control of Semi-Active Suspension System
Research on Historical Concept Modeling Language and Modeling Tool Based on Model Driven Architecture

Fungal Growth Kinetics Model Based on Carbon Cycle
Network Security
Research on Multi-Level Malicious Web Page Recognition Based on Topic Fusion and Improvement of CNN
Application and Research of Intelligent Security System Based on NFC and Cloud Computing Technology
Research on Network User Behavior Management System Based on Blockchain Technology 203
Sun Jianjun (Shandong Vocational College of Science and Technology, China)
Research on Smart Home Security Threat Modeling Based on STRIDE-IAHP-BN
Other Topics
A High Precision Refresh Method to Improve the Performance of Flash Storage Devices 214 Peixuan Li (Qinghai Normal University, China; State Key Laboratory of Tibetan Intelligent Information Processing and Application, China; Key Laboratory of Internet of Things of Qinghai Province, China; Academy of Plateau Science and Sustainability, China), Yaofang Zhang (Qinghai Normal University, China; State Key Laboratory of Tibetan Intelligent Information Processing and Application, China; Key Laboratory of Internet of Things of Qinghai Province, China; Academy of Plateau Science and Sustainability, China), Deli Yin (Chuzhou Polytechnic, China), and Ping Xie (Qinghai Normal University, China; State Key Laboratory of Tibetan Intelligent Information Processing and Application, China; Key Laboratory of Internet of Things of Qinghai Province, China; Academy of Plateau Science and Sustainability, China)
A Power-On Hardware Self-Test Framework in Web-Based OS
Prestress Optimal Design of Deployable Antenna Considering the Effect of Gravity

Electrostatic interaction investigations of the Barnase-Barstar Complex Using Molecular Dynamics Simulation	229
Yi Fu (Wuxi City College of Vocational Technology, China; Wuxi Research Center for Environmental Science & Engineering, China), Ji Zhao (Wuxi City College of Vocational Technology, China; Wuxi Research Center for Environmental Science & Engineering, China), and Juan Mei (Wuxi City College of Vocational Technology, China; Wuxi Research Center for Environmental Science & Engineering, China)	
Research on the Method of Leakage Inductance Suppression of High Frequency Transform Switching Power	
Study on Carbon Sink Value of Marine Resources	237
Author Index	241