2021 8th International Conference on Dependable Systems and Their Applications (DSA 2021)

Yinchuan, China
11 – 12 September 2021

IEEE Catalog Number: CFP21M61-POD
ISBN: 978-1-6654-4392-0

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:	CFP21M61-POD
ISBN (Print-On-Demand):	978-1-6654-4392-0
ISBN (Online):	978-1-6654-4391-3
ISSN:	2767-6676

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 8th International Conference on Dependable Systems and Their Applications (DSA)

DSA 2021

Table of Contents

Message from the Steering Committee Chair, General Chairs, and Program Chairs ..... **xvii**
Organizing Committee ..... **xix**
Program Committee ..... **xx**
Steering Committee ..... **xxii**
Keynotes ..... **xxiii**

Group 1

A Comprehensive Evaluation for Burr-Type NHPP-based Software Reliability Models 1
Siqiao Li (Hiroshima University, Japan), Tadashi Dohi (Hiroshima University, Japan), and Hiroyuki Okamura (Hiroshima University, Japan)

An Adaptive Large Neighborhood Search for Two-Dimensional Packing with Conflict Penalty 12
Ju Zeng (Wuhan University of Technology, China) and Xiaopan Zhang (Wuhan University of Technology, China)

An Empirical Study on Spectral Clustering-based Software Defect Detection 20
Mingshuang Qing (Southwest University of Science and Technology, China), Xiuting Ge (Nanjing University, China), ZhanWei Hui (Military Academy of Sciences, China), Ya Pan (Southwest University of Science and Technology, China), Yong Fan (Southwest University of Science and Technology, China), Xiaojuan Wang (Military Academy of Sciences, China), and Xu Cao (Military Academy of Sciences, China)

ComFormer: Code Comment Generation via Transformer and Fusion Method-based Hybrid Code Representation 30
Guang Yang (Nantong University, China), Xiang Chen (Nantong University; Nantong University of Aeronautics and Astronautics, China), Jinxin Cao (Nantong University, China), Shuyuan Xu (Nantong University, China), Zhanqi Cui (Nantong University of Aeronautics and Astronautics, China), Chi Yu (Nantong University, China), and Ke Liu (Nantong University, China)

EKD-BSP: Bug Report Severity Prediction by Extracting Keywords from Description 42
Yanxin Jia (Nantong University, China), Xiang Chen (Nantong University; Nanjing University of Aeronautics and Astronautics, China), Shuyuan Xu (Nantong University, China), Guang Yang (Nantong University, China), and Jinxin Cao (Nantong University, China)

Fault Localization-Guided Test Data Generation Approach for Novice Programs 54
Zheng Li (Beijing University of Chemical Technology, China), Xiaotang Zhou (Beijing University of Chemical Technology, China), Deli Yu (Beijing University of Chemical Technology, China), Yonghao Wu (Beijing University of Chemical Technology, China), Yong Liu (Beijing University of Chemical Technology, China), and Xiang Chen (Beijing University of Chemical Technology, China)

HMBFL: Higher-Order Mutation-based Fault Localization 66
Zheng Li (Beijing University of Chemical Technology, China), Butian Shi (Beijing University of Chemical Technology, China), Haifeng Wang (Beijing University of Chemical Technology, China), Yong Liu (Beijing University of Chemical Technology, China), and Xiang Chen (Nantong University, China)

Just-in-Time Defect Prediction Technology based on Interpretability Technology 78
Wei Zheng (Northwestern Polytechnical University, China), Tianren Shen (Northwestern Polytechnical University, China), and Xiang Chen (Nan Tong University, China)

MFRL-CA: Microservice Fault Root Cause Location based on Correlation Analysis 90
YuHua Chen (Guangxi University, Nanning, China), NingJiang Chen (Guangxi University, Nanning, China), WenXiu Xu (Guangxi University, Nanning, China), LinMing Lian (Guangxi University, Nanning, China), and Huan Tu (Guangxi University, Nanning, China)

Multi-Objective Evolutionary Algorithm for String SMT Solver Testing 102
Zhilei Ren (Dalian University of Technology, China), Xiaofei Fan (Dalian University of Technology, China), Xiaochen Li (University of Luxembourg, Luxembourg), Zhide Zhou (Dalian University of Technology, China), and He Jiang (Dalian University of Technology, China)

Multiscale Dense Convolutional Networks for Intelligent Fault Diagnosis of Rolling Bearing..... 114
Yadong Xu (Southeast University, China) and Beibei Sun (Southeast University, China)

Optimal Gateway Station Placement for Transmission Delay Minimization in Broadband LEO Satellite Communication System 120
Cong Xiong (Sun Yat-sen University, China), Xiang Chen (Sun Yat-sen University, China), Fuzhou Peng (Sun Yat-sen University, China), and Lei Wang (Beijing Space Information Relay and Transmission Technology Center, China)

Orchid: Building Dynamic Test Oracles with Training Bias for Improving Deep Neural Network Models 128
Haipeng Wang (City University of Hong Kong) and W.K. Chan (City University of Hong Kong)

Plum: Exploration and Prioritization of Model Repair Strategies for Fixing Deep Learning Models 140
Hao Zhang (City University of Hong Kong) and W.K. Chan (City University of Hong Kong)

Querent-Centric Domain Name System Modeling and Its Application in Passive Software Discovery 152
Jian Qu (Xi'an Jiaotong University, China), Xiaobo Ma (Xi'an Jiaotong University, China), and Wenmao Liu (NSFOCUS Inc., China)

Use of Deep Learning Model with Attention Mechanism for Software Fault Prediction 161
Ting-Yan Yu (National Tsing Hua University, Taiwan), Chin-Yu Huang (National Tsing Hua University, Taiwan), and Neil C. Fang (National Tsing Hua University, Taiwan)

Group 2

A Link Flooding Attack Detection Method based on Non-Cooperative Active Measurement 172
Xin Wang (Xi'an Jiaotong University, China), Xiaobo Ma (Xi'an Jiaotong University, China), and Jian Qu (Xi'an Jiaotong University, China)

A Method of Random Forest Classification based on Fuzzy Comprehensive Evaluation 178
Jing Zhu (Army Engineering University of PLA, China), Song Huang (Army Engineering University of PLA, China), Yaqing Shi (Army Engineering University of PLA, China), Yanqiu Wang (Baopo Technology Co. Ltd, China), and Kaishun Wu (Army Engineering University of PLA, China)

A Novel Trust-based Model for Collaborative Filtering Recommendation Systems using Entropy... 184
Lei Chen (Beijing University of Posts and Telecommunications), Yuyu Yuan (Beijing University of Posts and Telecommunications), Hongpu Jiang (Beijing University of Posts and Telecommunications), Ting Guo (Beijing University of Posts and Telecommunications), Pengqian Zhao (Beijing University of Posts and Telecommunications), and Jinsheng Shi (Beijing University of Posts and Telecommunications)

A Pruning Neural Network for Automatic Modulation Classification 189
Zherui Zhang (Harbin Engineering University) and Ya Tu (Harbin Engineering University)

A Recommendation Method for Process Modeling based on Clustering and Graph Neural Network ... 195
Xingjun Chen (Dalian Naval Academy, China) and Mengjie Shan (Wuhan University Of Technology, China)

A Trusted Solution to Hyperledger Fabric Reordering Problem 202
Qiucheng Sun (Beijing University of Posts and Telecommunications, China), Yuyu Yuan (Beijing University of Posts and Telecommunications, China), Ting Guo (Beijing University of Posts and Telecommunications, China), and Lei Chen (Beijing University of Posts and Telecommunications, China)

An Efficient Batch Verification Scheme for SM2 Signatures 208
Dingning Liu (Beijing University of Posts and Telecommunications), Yuyu Yuan (Beijing University of Posts and Telecommunications), Tengfei Xue (Huawei Technologies Co. Ltd, China), and Lei Chen (Beijing University of Posts and Telecommunications)

Analysing Experimental Results Obtained When Applying Search-based Testing to Verify Automated Driving Functions 213
Florian Klueck (Graz University of Technology, Austria), Franz Wotawa (Graz University of Technology, Austria), Gerhard Neubauer (AVL List GmbH, Austria), Jianbo Tao (AVL List GmbH, Austria), and Mihai Nica (AVL List GmbH, Austria)

Architecture-Level Schedulability Analysis with IO Constraint using AADL 220
Yunwei Dong (Northwestern Polytechnical University, China), Qianwen Gou (Northwestern Polytechnical University, China), and Pei Tang (Northwestern Polytechnical University, China)

Behavior-Driven Development of Software Product Lines 230
Tugkan Tuglular (Izmir Institute of Technology) and Deniz Egemen Coşkun (Izmir Institute of Technology)

Development of System Life Cycle Processes Standardization and Future Evolution Analysis 240
Yangyang Zhang (China Electronics Standardization Institute), Zengzhi Liu (China Electronics Standardization Institute), Qiang Han (North Minzu University), and Wenyuan Zhang (China Electronics Standardization Institute)

Distributed Countermeasure Algorithm based on Deep Reinforcement Learning 247
Jiping Huang (Harbin Engineering University, China), Wei Qiao (Harbin Engineering University, China), and Mengfei Xu (Harbin Engineering University, China)

Effectively and Efficiently Defending Shadowsocks Against Website Fingerprinting Attacks 251
Shuangshuang Huang (Xi'an Jiaotong University, China), Xiaobo Ma (Xi'an Jiaotong University, China), and Huafeng Bian (Xi'an Jiaotong University, China)

Generating Test Scenarios using SysML Activity Diagram 257
Xinyue Yang (University of Chinese Academy of Sciences, Chinese Academy of Sciences, China), Jian Zhang (Chinese Academy of Sciences, China), Shan Zhou (Chinese Academy of Sciences, China), Bin Wang (Chinese Academy of Sciences, China), and Ruixue Wang (Chinese Academy of Sciences, China)

Group 3

Interval Estimation for Non-Parametric NHPP-based Software Reliability Model via Simulation-based Bootstrap 265
Xiao Xiao (Tokyo Metropolitan University, Japan) and Tadashi Dohi (Hiroshima University, Japan)

Measuring Trust and Automatic Verification in Multi-Agent Systems 271
Hongpu Jiang (Beijing University of Posts and Telecommunications, China), Yuyu Yuan (Beijing University of Posts and Telecommunications, China), Ting Guo (Beijing University of Posts and Telecommunications, China), and Pengqian Zhao (Beijing University of Posts and Telecommunications, China)

MPSK Signal Modulation Recognition based on Decision Fusion 278
Jiaxin Lin (Harbin Engineering University, China), Zhichao Zhou (Harbin Engineering University, China), Xiangyu Wu (Harbin Engineering University, China), and Changbo Hou (Harbin Engineering University, China)

On the Performance Evaluation of Congestion Control Algorithms Against DDoS Attacks 284
Huafeng Bian (Xi'an Jiaotong University, China), Xiaobo Ma (Xi'an Jiaotong University, China), and Pengyu Pan (Xi'an Jiaotong University, China)

Ontology Dependence Closure based on Privacy Association 289
Meijuan Wang (Army Engineering University of PLA), Song Huang (Army Engineering University of PLA), Hui Li (Army Engineering University of PLA), and Jingli Han (Army Engineering University of PLA)

Performance Comparison of Three Parameter Estimation Methods on Heavily Censored Data 295
Renyan Jiang (Changsha University of Science and Technology) and Shihai Xiao (Changsha University of Science and Technology)

Radar Signal Separation Recognition Method based on Semantic Segmentation 302
Jiajun Ai (Harbin Engineering University, China), Lijie Hua (Harbin Engineering University, China), Jin Liu (Harbin Engineering University, China), Shunshun Chen (Harbin Engineering University, China), Yongjian Xu (Harbin Engineering University, China), and Changbo Hou (Harbin Engineering University, China)

Radar System Testability Design and Demonstration based on Fault Modes and Software Control 307
Guoli Zhao (Nanjing Research Institute of Electronics Technology, China), Chang Liu (Institute of Reliability Engineering Beihang University, China), Shaofang Li (Nanjing Research Institute of Electronics Technology, China), Zenghao Tian (Castle (Beijing) Technology Co., Ltd., China), Xi Liu (Nanjing Research Institute of Electronics Technology, China), and Haifeng Li (Beihang University, China)

SAR and Optical Image Matching based on Phase Congruency and Template Matching 315
Qingbo Ji (Harbin Engineering University, China), Lingjie Wang (Harbin Engineering University, China), Changbo Hou (Harbin Engineering University, China), Qiang Zhang (Harbin Engineering University, China), Qingquan Liu (Harbin Engineering University, China), and Yue Jiang (Harbin Engineering University, China)

Small Sample Electromagnetic Signal Recognition based on Time Series Data Augmentation 321
Xinrui Wang (Harbin Engineering University) and Yun Lin (Harbin Engineering University)

Target Tracking Algorithm based on Electromagnetic and Image Trajectory Matching 327
Yongjian Xu (Harbin Engineering University, China), Chunjie Zhang (Harbin Engineering University, China), Guowei Liu (Harbin Engineering University, China), Ziwei Wang (Harbin Engineering University, China), Zhichao Zhou (Harbin Engineering University, China), and Changbo Hou (Harbin Engineering University, China)

Transient Fault Tolerance on Multicore Processor in AMP Mode 332
Jie Li (Shandong Institute of Space Electronic Technology) and Yue Wang (Shandong Institute of Space Electronic Technology)

UAV Test Data Generation Method based on CycleGAN 338
Kunyu Gao (University of Chinese Academy of Sciences; Chinese Academy of Science, China), Jinbo Wang (Chinese Academy of Sciences, China), Bin Wang (Chinese Academy of Sciences, China), Ruixue Wang (Chinese Academy of Sciences, China), and Jiao Jia (Chinese Academy of Sciences, China)

Group 4

A Combination of Fourier Transform and Machine Learning for Fault Detection and Diagnosis of Induction Motors 344
Van Duc Nguyen (Leiden University, The Netherlands), Ewout Zwanenburg (Leiden University, The Netherlands), Steffen Limmer (Honda Research Institute Europe GmbH, Germany), Wessel Luijben (Samotics Company, The Netherlands), Thomas Back (Leiden University, The Netherlands), and Markus Olhofer (Honda Research Institute Europe GmbH, Germany)

A Coverage-Guided Fuzzing Framework based on Genetic Algorithm for Neural Networks 352
Gaolei Yi (Beihang University, China), Xiaoyu Yang (China North Vehicle Research Institude, China), Pu Huang (Beihang University, China), and Yichen Wang (Beihang University, China)

A Domain Knowledge-Guided Lightweight Approach for Security Bug Reports Prediction 359
Wei Zheng (Northwestern Polytechnical University, China), Zheng Chen (Northwestern Polytechnical University, China), Xiaoxue Wu (Yangzhou University, China), Weiqiang Fu (Northwestern Polytechnical University, China), Bowen Sun (Northwestern Polytechnical University, China), and Jingyuan Cheng (Northwestern Polytechnical University, China)

A Model for Ship-Helicopter Cooperative Anti-Submarine Tracking based on Favorable Situation 369
Zongxiang Lin (Dalian Naval Academy) and Yongkan Sun (Dalian Naval Academy)

A Model-based Test Cases Generation Method for Spacecraft Software 373
Ye Tian (Beihang University, China), Chenglong Li (Beihang University, China), and Beibei Yin (Beihang University, China)

A Practical Method based on MSVL for Verification of Social Network 383
Xiaoyu Yang (Xidian University, China) and Xiaobing Wang (Xidian University, China)

A Survey of Story-Generation Apps and Online Systems Between 2017 and 2020 390
Siming Zheng (Tianjin Foreign Studies University, China), Hongwei Liu (Tianjin Foreign Studies University, China), and Hongji Yang (University of Leicester, UK)

A Survey on Autonomous Driving Datasets 399
Weiyu Liu (Beihang University, China), Qian Dong (Chinese Academy of Sciences, China), Pengqi Wang (Chinese Academy of Sciences, China), Guang Yang (Chinese Academy of Sciences, China), Lingzhong Meng (Chinese Academy of Sciences, China), You Song (Beihang University, China), Yuan Shi (Chinese Academy of Sciences, China), and Yunzhi Xue (Chinese Academy of Sciences, China)

An Airborne Requirements Verification Method based on Requirement Elements using CRF 408
Yue Shen (COMAC Shanghai Aircraft Design & Research Institute, China), Yu Li (Shanghai Aircraft Airworthiness Certification Center of CAAC, China), Yuping Zhu (COMAC Shanghai Aviation Industrial (Group) Co. Ltd., China), Yong Cai (Shanghai Aircraft Airworthiness Certification Center of CAAC, China), and Jun Shao (Shanghai Aircraft Airworthiness Certification Center of CAAC, China)

An Automatic Approach to Extracting Requirement Dependencies based on Semantic Web 414
Hui Guan (Shenyang University of Chemical Technology, China), Guorong Cai (Shenyang University of Chemical Technology, China), and Chuan Zhao (Beijing Technology and Business University, China)

An Energy-Efficient Strategy based on Q-Learning for Energy Harvesting-based Wireless Sensor Network 421
Jiayuan Wei (Ningxia University, China), Xingyu Miao (Ningxia University, China), and Yongqi Ge (Ningxia University, China)

An Indoor Positioning System based on Intelligent Terminal 428
Haoran Yu (Beihang University, China), Yijie Gao (Beihang University, China), and Jiang Wu (Beihang University, China)

An Intellectual Property Data Access Control Method for Crowdsourced Testing System 434
Song Huang (Army Engineering University of PLA, China), Zhen Yang (Army Engineering University of PLA, China), Changyou Zheng (Army Engineering University of PLA, China), and Jinyong Wan (Army Engineering University of PLA, China)

An Interactive Computer Assisted Design System: Architecture and Design 439
Yuxuan Yan (Dalian Naval Academy, China) and Xingjun Chen (Dalian Naval Academy, China)

An Optimal Resource Scheduling of Debris Monitoring using Particle Swarm Algorithm with Constriction Factor 444
Tao Song (China University of Geosciences, China), Wei Wang (China University of Geosciences, China), Dongcheng Li (University of Texas at Dallas, USA), and Yining Zhao (China University of Geosciences, China)

Analytical Investigation of Anomaly Detection Methods based on Time-Domain Features and Autoencoders in Satellite Power Subsystem 451
Weihua Jin (Harbin Institute of Technology, Harbin, China), Bo Sun (Beijing Institute of Spacecraft System Engineering, Beijing, China), Zhidong Li (Beijing Institute of Spacecraft System Engineering, Beijing, China), Lei Zhang (Beijing Institute of Spacecraft System Engineering, Beijing, China), and Shijie Zhang (Harbin Institute of Technology, Harbin, China)

Applying Animation for the Interpretation of Beijing Symbols in the Second Dimensional Space 461
Lu Zhang (Beijing Union University, China), Shimiao Gao (Beijing Union University, China), and Meiyu Shi (Beijing Union University, China)

Group 5

Applying Microservice Refactoring to Object-Oriented Legacy System 467
Junfeng Zhao (Inner Mongolia University, China) and Ke Zhao (Inner Mongolia University, China)

ARB-BERT: An Automatic Aging-Related Bug Report Classification Method based on BERT 474
Mingxi Li (Beihang University, China) and Bei-Bei Yin (Beihang University, China)

Automatic Test Path Generation and Prioritization using UML Activity Diagram 484
Lili Fan (Anhui Polytechnic University, China), Yong Wang (Anhui Polytechnic University, China), and Tao Liu (Anhui Polytechnic University, China)

Code Comprehensibility Evaluation for Java Class based on LDA Topic Model 491
Yikang Shao (Beihang University, China) and Jun Ai (Beihang University, China)

Constructing a Creative Service Software with Semantic Web 499
Pei-Shu Huang (National Yang-Ming Chiao-Tung University, Taiwan), Faisal Fahmi (National Yang-Ming Chiao-Tung University, Taiwan), Feng-Jian Wang (National Yang-Ming Chiao-Tung University, Indonesia), and Hongji Yang (University of Leicester, England)

Construction of GUI Elements Recognition Model for AI Testing based on Deep Learning 508
Congran Zhang (Beihang University, China), Tao Shi (Beihang University, China), Jun Ai (Beihang University, China), and Wei Tian (WuHan Second Ship Design & Research Institute, China)

Decision-Making Method of UAV Maneuvering in Close-Range Confrontation based on Deep Reinforcement Learning 516
Jiang Wu (Beihang University, China), Xiaodong Fan (Beihang University, China), and Kaixiang Zhang (Beihang University, China)

Deep Reinforcement Learning-based Adaptive Real-Time Path Planning for UAV 522
Jiankang Li (Beihang University, China) and Yang Liu (Beihang University, China)

Design and Implementation of Serial Rabbit Ear Removal Architecture based on FPGA in Passive Detection 531
Shanshan Wang (Nanjing Institute of Electronic Technology, China), Qingnan Wu (Nanjing Institute of Electronic Technology, China), and Huifang Dong (Nanjing Institute of Electronic Technology, China)

Design and Implementation of Software Test System for Aviation Communication Radio Station... 536
Liu Tao (Southwest China Institute of Electronic Technology), Wang Yuebo (Southwest China Institute of Electronic Technology), Chen Chao (Southwest China Institute of Electronic Technology), Li Jixiu (Southwest JiaoTong University), and Pu Qinglu (Southwest China Institute of Electronic Technology)

Design of a Reliable Algorithmic with Deep Learning and Transfer Learning for Load Combination Recognition 541
Yanmei Jiang (Hebei University of Technology, China) and Mingsheng Liu (Hebei University of Technology, China)

Detection and Mitigation of Label-Flipping Attacks in Federated Learning Systems with KPCA and K-Means 551
Dongcheng Li (University of Texas at Dallas, USA), W. Eric Wong (University of Texas at Dallas, USA), Wei Wang (China University of Geosciences, China), Yao Yao (China University of Geosciences, China), and Matthew Chau (University of Texas at Dallas, USA)

Dictionary Learning Algorithm based on Restricted Boltzmann Machine 560
Liu Lian (Dalian Naval Academy)

Emotions Behind Divergent Thinking 566
Zhongxi Lu (University of Leicester, UK), Jinli Luo (University of Leicester, UK), and Hongji Yang (University of Leicester, UK)

Event Graph-based Warship Formation Air Defense Scheduling Model and Algorithm 572
Jinbo Gong (Wuhan University of Technology, China), Xu Zhang (Wuhan University of Technology, China), Yaowu Liu (Wuhan University of Technology, China), and Xiaopan Zhang (Wuhan University of Technology, China)

Fault Diagnosis of the Four-Rotor Unmanned Aerial Vehicle using the Optimized Deep Forest Algorithm based on the Wavelet Packet Translation 581
Shaojie Ai (Beihang University, China), Weize Shang (Beihang University, China), Jia Song (Beihang University, China), and Guobiao Cai (Beihang University, China)

KD-RRT: Restricted Random Testing based on K-Dimensional Tree 590
Junlong Lian (Jiangsu University, China), Chenhui Cui (Jiangsu University, China), Weifeng Sun (Jiangsu University, China), Yiming Wu (Jiangsu University, China), and Rubing Huang (Jiangsu University; Macau University of Science and Technology, China)

Malware Detection using CNN via Word Embedding 600
Jie Zhang (Xidian University, China), Lin Yan (Xidian University, China), Rong Wang (Xidian University, China), Cong Tian (Xidian University, China), and Zhenhua Duan (Xidian University, China)

Group 6

Multi-Agent Trust Evaluation Model based on Reinforcement Learning 608
Jia Haoran (Beijing University of Posts and Telecommunications), Yuan Yuyu (Beijing University of Posts and Telecommunications), Han Qiang (North Minzu University), Zhao Pengqian (Beijing University of Posts and Telecommunications), and Guo Ting (Beijing University of Posts and Telecommunications)

Multi-Granularity Information Expression Application on Patent Text Clustering 614
Dongpu Sun (Dalian Navy Academy)

Multi-UAV Reconnaissance Task Assignment based on Wide-Area Search Scenario 620
Junpeng Zhang (Dalian Naval Academy) and Xingjun Chen (Dalian Naval Academy)

Operational Task Decomposition Method based on Extended HTN Planning 626
Nie Junfeng (Dalian Naval Academy)

Privacy Protocol Analysis based on Android Application 631
Yongming Yao (Peoples Liberation Army Engineering University; Nanjing University of Posts and Telecommunications, China), Yulin Wang (Nanjing University of Posts and Telecommunications, China), Weiyi Jiang (Nanjing University of Posts and Telecommunications, China), Ziyuan Wang (Nanjing University of Posts and Telecommunications, China), and Song Huang (Peoples Liberation Army Engineering University, China)

Quality Evaluation of Image Dataset based on Label File 639
Youdi Gong (Beihang University, China), Yunzhi Xue (Institute of Software Chinese Academy of Sciences, China), Qian Dong (Institute of Software Chinese Academy of Sciences, China), Guang Yang (Institute of Software Chinese Academy of Sciences, China), Pengqi Wang (Institute of Software Chinese Academy of Sciences, China), Yuan Shi (Institute of Software Chinese Academy of Sciences, China), and Lingzhong Meng (Institute of Software Chinese Academy of Sciences, China)

Satellite On-Orbit Anomaly Detection and Adaptive Model Updating Method 647
Zhidong Li (Beijing Institute of Spacecraft System Engineering, Beijing, China), Bo Sun (Beijing Institute of Spacecraft System Engineering, Beijing, China), Lei Zhang (Beijing Institute of Spacecraft System Engineering, Beijing, China), and Weihua Jin (Harbin Institute of Technology, Harbin, China)

Scenario-based Reliability Testing Methods for Smart Grid Dispatching and Control System 656
Linglin Gong (China Electric Power Research Institute, China), Yujia Li (China Electric Power Research Institute, China), Hongfu Chen (State Grid Shanghai Electric Power Co, China), Xin Xu (China Electric Power Research Institute, China), and Fang Liu (China Electric Power Research Institute, China)

Signal Modulation Recognition based on Convolutional Autoencoder and Time-Frequency Analysis 664
Xiangyu Wu (Harbin Engineering University, China), Jing Zhang (Harbin Engineering University, China), Changbo Hou (Harbin Engineering University, China), Guowei Liu (Harbin Engineering University, China), Jie Zhang (Harbin Engineering University, China), and Jin Liu (Harbin Engineering University, China)

Software Defect Prediction for Specific Defect-Type based on Augmented Code Graph Representation 669
Jiaxi Xu (Beihang University, China), Jun Ai (Beihang University, China), and Tao Shi (Beihang University, China)

Software Selection Test of Enterprise-Level Big Data Analysis Platform 679
Chiyang Gao (Beijing CCID Software Test Engineering Technology Center Co. Ltd, China), Wenbing Luo (Beijing CCID Software Test Engineering Technology Center Co. Ltd, China), and Fei Xie (Beijing CCID Software Test Engineering Technology Center Co. Ltd, China)

Stability Analysis and Parameter Design for Stabilizing One Delay Point in Two-Delay Differential Equations 685
Hanyuan Wu (Beihang University), Xiangmin Li (Beihang University), and Zhiyu Xi (Beihang University)

Survey on Autonomous Vehicle Simulation Platforms 692
Guang Yang (Institute of Software Chinese Academy of Sciences, China), Yunzhi Xue (Institute of Software Chinese Academy of Sciences, China), Lingzhong Meng (Institute of Software Chinese Academy of Sciences, China), Pengqi Wang (Institute of Software Chinese Academy of Sciences, China), Yuan Shi (Institute of Software Chinese Academy of Sciences, China), Qinghong Yang (Beihang University, China), and Qian Dong (Institute of Software Chinese Academy of Sciences, China)

Test Case Reuse based on ESIM Model 700
Xiaomeng Chen (University of Chinese Academy of Sciences; Chinese Academy of Sciences, China), Jinbo Wang (Chinese Academy of Sciences, China), Shan Zhou (Chinese Academy of Sciences, China), Panpan Xue (Chinese Academy of Sciences, China), and Jiao Jia (Chinese Academy of Sciences, China)

Test Method of Flight Control Software based on Input Field Model 706
Dongmei Dong (Beijing Electro-Mechanical Engineering Institute, China), Wuwu Hua (Beijing Electro-Mechanical Engineering Institute, China), Zhihao Liu (Beihang University, China), Yunyu Fang (Beijing Electro-Mechanical Engineering Institute, China), and Yue Hou (Beijing Electro-Mechanical Engineering Institute, China)

The Evaluation of Teaching Effect based on Interpretable Machine Learning 712
QingGuo Yan (State Grid Jiangsu Electric Power Co. LTD), Jun Zhao (State Grid Jiangsu Electric Power Co. LTD), XianGuang Cha (State Grid Jiangsu Electric Power Co. LTD), Wei Dai (State Grid Jiangsu Electric Power Co. LTD), ZeJia He (State Grid Jiangsu Electric Power Co. LTD), Lin Cui (State Grid Jiangsu Electric Power Co. LTD), and LingShuang Yu (Nanjing University)

Timing Attacks in Single-Chip Microcomputer through Workflow Verification 716
Cong Li (North Minzu University), Qiang Han (North Minzu University), Bingbing Lei (North Minzu University), Haide Liu (North Minzu University), Cong Liu (North Minzu University), and Yu He (North Minzu University)

Verification of CTCS-3 using TMSVL 722
Yining Wang (Xidian University, China), Chunyi Li (Xidian University, China), and Xiaobing Wang (Xidian University, China)

Group 7

A Mutation-based Approach to Repair Deep Neural Network Models 730
Huanhuan Wu (Beijing Information Science and Technology University, China), Zheng Li (Beijing Information Science and Technology University, China), Zhanqi Cui (Beijing Information Science and Technology University, China), and Jiaming Zhang (Beijing Information Science and Technology University, China)

A Novel Building Worker Detection based on Cross Feature Pyramid Network 732
Yumin Gao (Hubei Weite Sensing Internet of Things Research Institute Co. Ltd), Daojin Nie (Weite Technologies Co. Ltd), Huimin Gan (China Yangtze Power Co. Ltd. Three Gorges Hydropower Plant), Zhiyong Cao (Hubei Weite Sensing Internet of Things Research Institute Co. Ltd), Ning Lin (Guangxi Xijiang Development Investment Group Co. Ltd), and Cuicui Sun (Hubei Weite Sensing Internet of Things Research Institute Co. Ltd)

A Reliable and Low-Cost Flip-Flop Hardened against Double-Node-Upsets 734
Aibin Yan (Anhui University, China), Aoran Cao (Anhui University, China), Kuikui Qian (Anhui University, China), Liang Ding (Anhui University, China), Zhihui He (Anhui University, China), Zhengzheng Fan (Anhui University, China), and Xiaoqing Wen (Kyushu Institute of Technology, Japan)

An Improved Simhash Algorithm for Academic Paper Checking System 737
Mengxia Wang (YanTai University) and Wenqiang Fan (YanTai University)

Capability Analysis Method for Electromagnetic Spectrum 739
Yongchao Meng (University of Xidian, China), Peihan Qi (University of Xidian, China), Xiaoyu Zhou (University of Xidian, China), and Zan Li (University of Xidian, China)

Exploiting Bitcoin Mining Pool for Stealthy and Flexible Botnet Channels 741
Pengyu Pan (Xi'an Jiaotong University, China), Xiaobo Ma (Xi'an Jiaotong University, China), and Huafeng Bian (Xi'an Jiaotong University, China)

Heterogeneous Graph Modeling and Visualization for Cyber Asset Management 743
Shuowen Fu (Central South University, China), Xin Zhao (Central South University, China), Yunpeng Chen (Central South University, China), Yaqi Xu (Central South University, China), Xiaoli Li (Central South University, China), Fangfang Zhou (Central South University, China), and Ying Zhao (Central South University, China)

Impact of Mechanism and Influencing Factors of Radio Frequency Fingerprint on Wireless Devices 745
Wang Shihao (Harbin Engineering University Harbin, China) and Zha Haoran (Harbin Engineering University Harbin, China)

Modulation Recognition Algorithm based on Digital Communication Signal Time-Frequency Image 747
Kuixian Li (Harbin Engineering University Harbin, China) and Jibo Shi (Harbin Engineering University Harbin, China)

Proof of Greatest Number Program and Find 749
Zhihui Shan (North Minzu University, China), Qiang Han (North Minzu University, China), and Meng Han (North Minzu University, China)

Three Classifications of Big Data-based Software Testing 751
Pan Liu (Shanghai Business School, China), Jiaqi Yan (Shanghai Business School, China), and Xiaoyu Song (Shanghai Business School, China)

Underwater Unmanned Vehicle Search Path Optimization Arithmetic 753
Wenjin Yin (Dalian Naval Academy), Zhijiang Yuan (Dalian Naval Academy), Fei Long (Dalian Naval Academy), and Ye Zhao (Dalian Naval Academy)

Author Index **757**