PROCEEDINGS OF SPIE

International Conference on Computer Network Security and Software Engineering (CNSSE 2022)

Wenshun Sheng Yongquan Yan Editors

25–27 February 2022 Zhuhai, China

Organized by
Guangzhou Computer Society
Guangzhou Association for Science and Technology

Sponsored
AEIC Academic Exchange Information Center

Published by SPIE

Volume 12290

Proceedings of SPIE 0277-786X, V. 12290 SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in *International Conference on Computer Network Security and Software Engineering (CNSSE 2022)*, edited by Wenshun Sheng, Yongquan Yan, Proc. of SPIE 12290, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510655980

ISBN: 9781510655997 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

vii Conference Committees

COMPUTER NETWORK SECURITY AND MODEL PREDICTION APPLICATIONS

12290 02	Research on modeling method of network attack chain efficiency [12290-1]
12290 03	Audio adversarial attack: HIS attack [12290-36]
12290 04	A measure for enhancing HREIK network lookup [12290-40]
12290 05	Self-attention on RNN-based text classification [12290-49]
12290 06	A privacy-preserving data collection scheme for smart agriculture based on edge blockchain [12290-25]
12290 07	A conformance check method for evaluating the fitness of a process model with duplicate tasks [12290-12]
12290 08	A de-obfuscation system based on Markov models [12290-34]
12290 09	Research on the construction method of encrypted malicious traffic detection system based on machine learning [12290-7]
12290 0A	A fast and robust mesh construction method for medial axis transform [12290-10]
12290 OB	Research on the aggregation of V2G security authentication and privacy data based on blockchain [12290-19]
12290 OC	Transplantation and optimization of GPU-oriented SM3 cryptographic hash algorithm [12290-21]
12290 OD	Network intrusion monitoring based on improved ant colony algorithm [12290-4]
12290 OE	Third party testing and evaluation of 3D geometric modeling kernels [12290-9]
12290 OF	Toward more efficient iris recognition using a lightweight CNN framework with attention mechanism [12290-28]
12290 OG	A feature matching-based attack on text CAPTCHAs [12290-13]
12290 OH	Automatic summarization of medical conversations based on episodic memory network hierarchical labels [12290-5]

12290 01	Evaluating deep neural network for automated sleep staging in real-life scenarios [12290-42]
12290 OJ	The fruit fly optimization algorithm based on normal cloud model [12290-15]
12290 OK	Improved multi-identity fully homomorphic encryption scheme based on LWE [12290-41]
12290 OL	Analysis of cyber security rebuts and its rising aims on current technologies [12290-52]
12290 OM	A static analysis method of incremental codes using value dependency graph [12290-32]
12290 ON	Modeling hybrid systems based on combination of SysML and Modelica [12290-37]
12290 00	Atrial fibrillation detection based on ECG [12290-44]
12290 OP	Research on reliable transmission strategy of WSN with adjustable cache location [12290-8]
	BIG DATA ALGORITHMS AND SOFTWARE ENGINEERING SIGNAL PROCESSING
12290 OQ	A multi-controller placement problem in SDWAN [12290-6]
12290 OR	Design and implementation of college entrance examination volunteer intelligent filling system based on big data [12290-48]
12290 OR 12290 OS	• • • • • • • • • • • • • • • • • • • •
	based on big data [12290-48] Prediction of residential water consumption based on K-means and improved KNN algorithm
12290 OS	based on big data [12290-48] Prediction of residential water consumption based on K-means and improved KNN algorithm [12290-2] Quantum group blind signature scheme based on measurement-based quantum computation
12290 OS 12290 OT	based on big data [12290-48] Prediction of residential water consumption based on K-means and improved KNN algorithm [12290-2] Quantum group blind signature scheme based on measurement-based quantum computation [12290-14]
12290 OS 12290 OT 12290 OU	Prediction of residential water consumption based on K-means and improved KNN algorithm [12290-2] Quantum group blind signature scheme based on measurement-based quantum computation [12290-14] Research on autopilot test method based on data playback [12290-17]
12290 OS 12290 OT 12290 OU 12290 OV	Prediction of residential water consumption based on K-means and improved KNN algorithm [12290-2] Quantum group blind signature scheme based on measurement-based quantum computation [12290-14] Research on autopilot test method based on data playback [12290-17] Application research of software engineering technology in the era of big data [12290-33] Research on demand management based on SYSML complex relationship in digital nuclear
12290 OS 12290 OT 12290 OU 12290 OV 12290 OW	Prediction of residential water consumption based on K-means and improved KNN algorithm [12290-2] Quantum group blind signature scheme based on measurement-based quantum computation [12290-14] Research on autopilot test method based on data playback [12290-17] Application research of software engineering technology in the era of big data [12290-33] Research on demand management based on SYSML complex relationship in digital nuclear reactor [12290-39]

12290 10	Research on the application of VR technology in the command hall of Qingyun choir [12290-55]
12290 11	Research on classification of COVID-19 and common pneumonia by x-ray images based on convolutional attention mechanism [12290-50]
12290 12	A new data process framework of industrial big data based on feature selection [12290-57]
12290 13	MCI classification based on fusion of brain network properties and local cortex signal features [12290-35]
12290 14	Image self-embedding semi-fragile watermarking algorithm based on block truncation coding [12290-11]
12290 15	Raft consensus algorithm based on reputation mechanism [12290-22]
12290 16	Design of EAST diagnostic database based on HDF5 [12290-16]
12290 17	Design and implementation of online training platform for logistics management based on JSP technology [12290-47]
12290 18	Research on the overall design of intelligent management cloud platform in Longhu mountain Taoism scenic spot: thinking based on big data [12290-24]
12290 19	Realization of simulation droplet deformation in shear flow based on DCU acceleration device $[12290\text{-}58]$
12290 1A	The design and realization of carrying capacity of resources and environment and suitability for territorial and spatial development evaluation system [12290-23]
12290 1B	Design method of cultural and creative products of Fujian and South African heritage based on simulated annealing algorithm $[12290-54]$
12290 1C	Database programming technology for computer software engineering [12290-30]
12290 1D	Improved semantic segmentation algorithm based on attention mechanism and pyramid module [12290-53]

Conference Committees

General Conference Chair

Zhiyong Zhang, Henan University of Science and Technology (China)

Technical Program Committee Chair

Philippe Fournier-Viger, Harbin Institute of Technology (China)

Publication Chair

Qujiang Lei, University of Chinese Academy of Sciences (China)

Local Committee Chairs

Ji Wang, Ningbo University (China) **Carlos Becker Westphall**, Federal University of Santa Catarina (Brazil)

Academic Committees

Zongxi Li, Xi'an Jiaotong University (China)
Jalil Piran, Sejong University (Korea, Republic of)
Jian Cao, Air Force Engineering University (China)
Lei Zhang, Henan University (China)
Nirmalya Thakur, University of Cincinnati (United States)

Program Committees

Fangfang Jian, Henan University of Science and Technology (China)
 Yongquan Yan, Shanxi University of Finance and Economics (China)
 Wenshun Sheng, Nanjing Tech University (China)
 Junwen Chen, China Petroleum Engineering and Construction
 Corporation, Southwest Branch (China)
 Cheng Jin, New United Group Company Ltd. (China)

Technical Program Committees

Anhui Liang, Guangdong University of Technology (China)
Kevin Cohen, University of Colorado Boulder (United States)
Marcin Paprzycki, Systems Research Institute (Poland)
Maria Ganzha, Warsaw University of Technology (Poland)
Ying-Ren Chien, National Ilan University (China)
Vladimir G. Chigrinov, Foshan University (China)
Mamoun Alazab, Charles Darwin University (Australia)

Mahmoud AlShawabkeh, Guangxi Normal University for Nationalities (China)

Mohamed A. Sullabi, Libyan Academy-Misurata Branch (Libya) **Paul Blondel**, Université Picardie Jules Vernes (France)