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Information and Communications Security

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Preface

This volume contains papers that were selected for presentation and publication at the 23rd International Conference on Information and Communications Security (ICICS 2021), which was jointly organized by Chongqing University, Xi'an Jiaotong University, and Peking University in China during November 19–21, 2021. ICICS is one of the mainstream security conferences with the longest history. It started in 1997 and aims at bringing together leading researchers and practitioners from both academia and industry to discuss and exchange their experiences, lessons learned, and insights related to computer and communication security.

This year's Program Committee (PC) consisted of 141 members with diverse backgrounds and broad research interests. A total of 202 valid paper submissions were received. The review process was double blind, and the papers were evaluated on the basis of their significance, novelty, and technical quality. Most papers were reviewed by four or more PC members. The PC meeting was held online with intensive discussion over more than two weeks. Finally, 49 papers were selected for presentation at the conference giving an acceptance rate of 24%.

A "Best Paper Selection Committee" with five PC members of diverse backgrounds from around the world was formed, which selected the two best papers after a lengthy discussion. The paper "Rethinking Adversarial Examples Exploiting Frequency-Based Analysis" authored by Sicong Han, Chenhao Lin, Chao Shen, and Qian Wang received the Best Paper Award, while the paper "CyberRel: Joint Entity and Relation Extraction for Cybersecurity Concepts" authored by Yongyan Guo, Zhengyu Liu, Cheng Huang, Jiayong Liu, Wangyuan Jing, Ziwang Wang, and Yanghao Wang received the Best Student Paper Award. Both awards were generously sponsored by Springer.

ICICS 2021 was honored to offer two outstanding keynote talks: "Engineering Trustworthy Data-Centric Software: Intelligent Software Engineering and Beyond" by Tao Xie and "Securing Smart Cars – Opportunities and Challenges" by Long Lu. Our deepest gratitude to Tao and Long for sharing their insights during the conference.

For the success of ICICS 2021, we would like to first thank the authors of all submissions and the PC members for their great effort in selecting the papers. We also thank all the external reviewers for assisting the reviewing process. For the conference organization, we would like to thank the ICICS Steering Committee, the general chairs, Xiaohong Guan and Xiaofeng Liao, the publicity chairs, Qingni Shen, Qiang Tang, and Yang Zhang, and the publication chair, Dongmei Liu. Special thanks to Tao Xiang for the local arrangements. Finally, we thank everyone else, speakers, session chairs, and volunteer helpers for their contributions to the program of ICICS 2021.

Last but not least, we wish to extend a huge thank you to healthcare frontliners and our colleagues in the research of vaccine and immunization in fighting COVID-19. ICICS 2021 could not have become one of the first mainstream security conferences returning to an in-person setting without their enormous contribution.

November 2021

Debin Gao
Qi Li

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Keynotes

Engineering Trustworthy Data-Centric Software: Intelligent Software Engineering and Beyond

Tao Xie

Peking University

Abstract. As an example of exploiting the synergy between AI and software engineering, the field of intelligent software engineering has emerged with various advances in recent years. Such field broadly addresses issues on intelligent [software engineering] and [intelligence software] engineering. The former, intelligent [software engineering], focuses on instilling intelligence in approaches developed to address various software engineering tasks to accomplish high effectiveness and efficiency. The latter, [intelligence software] engineering, focuses on addressing various software engineering tasks for intelligence software, e.g., AI software. However, engineering trustworthy data-centric software (which AI software components are part of) requires research contributions from compiler, programming languages, formal verification, security, and software engineering besides systems and hardware. This talk will discuss recent research and future directions in the field of intelligent software engineering along with the broad scope of engineering trustworthy data-centric software.

Securing Smart Cars – Opportunities and Challenges

Long Lu

NIO

Abstract. As cars become more intelligent and connected, the security of on-car systems, software, and data has caught heavy attention from academia, industry, and regulators. This talk will discuss the key technical aspects of smart car security, including low-level system security, secure and robust autonomous driving, V2X security, data security, etc., highlighting the research and technical opportunities and challenges.

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