# **Studies in Computational Intelligence**

Volume 787

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Roger Lee Editor

# Computational Science/Intelligence & Applied Informatics



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ISSN 1860-949X ISSN 1860-9503 (electronic) Studies in Computational Intelligence ISBN 978-3-319-96805-6 ISBN 978-3-319-96806-3 (eBook) https://doi.org/10.1007/978-3-319-96806-3

Library of Congress Control Number: 2018949633

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## Foreword

The purpose of the 5th ACIS International Conference on Computational Science/Intelligence & Applied Informatics (CSII 2018) which was held on July 10–12, 2018 in Yonago, Japan was to together researchers, scientists, engineers, industry practitioners, and students to discuss, encourage, and exchange new ideas, research results, and experiences on all aspects of A Computational Science/Intelligence & Applied Informatics and to discuss the practical challenges encountered along the way and the solutions adopted to solve them. The conference organizers have selected the best 13 papers from those papers accepted for presentation at the conference in order to publish them in this volume. The papers were chosen based on review scores submitted by members of the program committee and underwent further rigorous rounds of review.

In Chapter "GUI Testing for Introductory Object-Oriented Programming Exercises", Ushio Inoue presents a method to test and score student programs with graphical user interfaces written in JavaFX. The method is based on scripts that analyzes the structure of programs under test and simulates user's interactions.

In Chapter "Python Deserialization Denial of Services Attacks and Their Mitigations", Kousei Tanaka and Taiichi Saito precisely describe the DoS attacks and their mitigations using a specially crafted data that consumes huge memory in deserialization. There is a possibility that the memory consumption leads to denial of services attacks.

In Chapter "A Branch-and-Bound Based Exact Algorithm for the Maximum Edge-Weight Clique Problem", Satoshi Shimizu, Kazuaki Yamaguchi, and Sumio Masuda propose an exact algorithm based on branch-and-bound. By some computational experiments, they confirmed that their proposal algorithm is faster than the methods based on mathematical programming.

In Chapter "A Software Model for Precision Agriculture Framework Based on Smart Farming System and Application of IoT Gateway", Symphorien Karl Yoki Donzia, Haeng-Kon Kim, and Ha Jin Hwang propose a framework for precision agriculture using IoT for solving human food, and the productivity of crops must be increased first. IoT solution through architecture, platforms, and IoT standards, or the use of interoperable IoT technologies beyond the adopters, in particular, simplifies the existing proposals.

In Chapter "Components of Mobile Integration in Social Business and E-commerce Application", Mechelle Grace Zaragoza, Haeng-Kon Kim, and Youn Ky Chung proposed an application of mobile integration components in social enterprise and e-commerce as a software development methodology to simply integrate different basic components of the technology into a single web-based solution. They propose a systematic development process for the software agent using components and UML.

In Chapter "Design and Evaluation of a MMO Game Server", Youngsik Kim, Ki-Nam Kim implement a simple MMO game server using IOCP and evaluate its performance. The simple MMO game server implemented in this paper also supports multi-thread synchronization and dead reckoning.

In Chapter "A Study on the Characteristics of Electroencephalography (EEG) by Listening Location of OLED Flat TV Speaker", Hyungwoo Park, Sangbum Park, and Myung-Jin Bae have analyzed the acoustic characteristics of a directly driving the OLED panel speakers, using electroencephalography (EEG); in addition, they study the advantages of direct driving sound.

In Chapter "A Study on Design of Efficient Private Blockchain", Ki Ho Kwak, Jun Taek Kong, Sung In Cho, Huy Tung Phuongand Gwang Yong Gim present an issue of a reliable private blockchain that will be derived and design measures be proposed to make a contribution so as to enable safe utilization in the environment of P2P distributed network.

In Chapter "Designing System Model to Detect Malfunction of Gas Sensor in Laboratory Environment", Ki-Su Yoon, Seoung-Hyeon Lee, Jae-Pil Lee, and Jae-Kwang Lee collect correlation data of temperature sensor and gas sensor to prevent this. After confirming the correlation through correlation analysis, they calculate regression coefficient by regression analysis and obtain regression equation that can extract sample values of gas sensor data and temperature sensor data.

In Chapter "Design of Device Mutual Authentication Protocol in Smart Home Environment", Jae-Pil Lee, Seoung-Hyeon Lee, Jae-Gwang Lee, and Jae-Kwang Lee suggest a security protocol for device/user authentication and access control in order to enable easy and convenient compatibility services. In addition, it gives you a way to establish a safe and secure framework through the protocol suggested.

In Chapter "A Study of Groupthink in Online Community", Nhu-Quynh Phan, Seok-Hee Lee, Jin Won Jang, and Gwang Yong Gim present a study about groupthink phenomenon that can affect the decision-making quality of online communities in Korea. This empirical study toward the respondents was in Korea who currently participate online communities.

In Chapter "Development of a Physical Security Gateway for Connectivity to Smart Media in a Hyper-Connected Environment", Yong-Kyun Kim, Geon Woo Kim, and Seoung-Hyeon Lee propose a method of blocking the intrusion from the external through unidirectional communication method, to help prevent the risk of leakage of personal information. There is a great need for a method of protecting the personal data of the server from the invasion of the server.

In Chapter "Design and Implementation of Security Threat Detection and Access Control System for Connected Car", Joongyong Choi, Hyeokchan Kwon, Seokjun Lee, Byungho Chung, and Seong-il Jin design a whitelist-based access control system to detect and block malicious attempts to access an in-vehicle network through an infotainment device in a connected car environment and present the implementation results.

It is our sincere hope that this volume provides stimulation and inspiration, and that it will be used as a foundation for works to come.

Tokyo, Japan July 2018 Takayuki Fujimoto Toyo University

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