
Foreword

Special Issue on Software Engineering and DevOps

Taiwan's software industry has poised itself to become one of the most important industries with its growing annual revenues. As a result, software engineering is also getting more and more attention in Taiwan. As an emerging sub-discipline of software engineering, DevOps (Development & Operations) aims to shorten the software development life cycle and enable continuous delivery with high software quality. Presently, the theories and practices of DevOps have become hot topics in Taiwan. The special issue includes the extended version of selected papers accepted to the 2021 Software Engineering in Taiwan Workshop (SETaiwan2021), co-located with the 28th Asia Pacific Software Engineering Conference (APSEC 2021). Each paper is briefly described below.

The paper "Using User-Defined Domain-Specific Visual Languages to Modularize Programs for Conducting Experiments" proposes customizing a user-defined DSL to represent different experimental workflows and follow Dijkstra's sequencing discipline in structured programming to develop a proof-of-concept framework. Their approach can help domain experts to express the experimental concern and quickly construct programs for running related experiments.

The paper "Exploring Time-Related Micro-Behavioral Patterns in a Python Programming Online Course" proposes a new approach for discovering time-embedded behavioral patterns in micro behaviors of MOOC learners and incorporating them as features for student profiling and learning performance prediction. Their empirical results show the usability of the proposed time-embedded behavioral patterns in immediate diagnosis learners' engagement, raising new challenges for learning analytics with time concerning to achieve precision education.

The paper "A Microservices Orchestration Library based on PHP and RESTful API" explores how to apply the service orchestration pattern to orchestrate the communications among microservice endpoints using PHP programming language. A set of service orchestration libraries, called Anser, are proposed based on PHP and RESTful API architecture. Developers can easily adopt the orchestration design pattern by using Anser to develop web applications based on microservices. Through performance evaluation, Anser could facilitate the stability of microservices applications with lower error rates.

The paper "An Operation-Injection Approach to Detect Runtime Permission Crashes of Android Apps" proposes an approach in which a crawler is first used to explore and detect permission crashes of Android apps systematically. During the exploration, a state model is also produced. Based on the model, test paths related to runtime permissions are generated. The experimental results show that the proposed approach can detect runtime permission crashes effectively.

• Introduction to Guest Editors •



Hung-Yu Kao received the B.S. and M.S. degree in Computer Science from National Tsing Hua University in 1994 and 1996 respectively. In July 2003, he received the PhD degree from the Electrical Engineering Department, National Taiwan University. He is currently a Professor of Department of Computer Science and Information Engineering (CSIE) of National Cheng Kung University. He is currently the Vice Chair of College of EECS in NCKU and the Chair of Taiwanese Association of Artificial Intelligence. His research interests include Natural Language Processing (NLP), Web information retrieval / extraction, search engine, knowledge management, data mining, social network analysis and bioinformatics. He has published more than 120 research papers in refereed international journals and conference proceedings. He is a member of IEEE and ACM.



Shin-Jie Lee is an Associate Professor in Computer and Network Center at National Cheng Kung University (NCKU) in Taiwan and holds joint appointments from Department of Computer Science and Information Engineering at NCKU. His current research interests include software engineering and automated software testing. He received his Ph.D. degree in Computer Science and Information Engineering from National Central University in Taiwan in 2007.



Chih-Hung Chang is an Associate Professor in Department of Computer Science and Communication Engineering at Providence University in Taiwan. He is a member of the IEEE Computer Society. He received his Ph.D. degree in computer science from Feng Chia University in 2004. His research interests include software engineering, cloud service, big data, and deep learning. He is a member of the IEEE Computer Society.



Tse-Hsun (Peter) Chen is an Associate Professor in the Department of Computer Science and Software Engineering at Concordia University, Montreal, Canada. He leads the Software Performance, Analysis, and Reliability (SPEAR) Lab, which focuses on conducting research on performance engineering, program analysis, log analysis, production debugging, and mining software repositories. His work has been published in flagship conferences and journals such as ICSE, FSE, TSE, EMSE, and MSR. Dr. Chen obtained his BSc from the University of British Columbia, and MSc and PhD from Queen's University. Besides his academic career, Dr. Chen also worked as a software performance engineer at BlackBerry for over four years. Early tools developed by Dr. Chen were integrated into industrial practice for ensuring the quality of large-scale enterprise systems. More information at: <http://petertsehsun.github.io/>.
