2023 IEEE/ACM 45th International **Conference on Software Engineering: Software Engineering** in Practice (ICSE-SEIP 2023)

Melbourne, Australia 17 – 19 May 2023



IEEE Catalog Number: CFP23L79-POD ISBN:

979-8-3503-0038-3

Copyright © 2023 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:
 CFP23L79-POD

 ISBN (Print-On-Demand):
 979-8-3503-0038-3

 ISBN (Online):
 979-8-3503-0037-6

ISSN: 2832-7640

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



2023 IEEE/ACM 45th International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP) ICSE-SEIP 2023

Table of Contents

CSE-SEIP 2023 Committees
SEIP - Software Engineering in Practice
Inderstanding Inconsistency in Azure Cosmos DB with TLA+
caling Web API Integrations
AppHunter: Identifying Inconsistent Behaviors of Blockchain-Based Decentralized Applications
volutionary Approach for Concurrency Testing of Ripple Blockchain Consensus Algorithm 36 Martijn van Meerten (Delft University of Technology, Netherlands), Burcu Kulahcioglu Ozkan (Delft University of Technology, Netherlands), and Annibale Panichella (Delft University of Technology, Netherlands)
Model for Understanding and Reducing Developer Burnout
Model-Based, Quality Attribute-Guided Architecture Re-Design Process at Google

An Empirical Comparison on the Results of Different Clone Detection Setups for C-Based Projects
Yan Zhou (Huawei, China), Jinfu Chen (Centre for Software Excellence at Huawei, Canada), Yong Shi (Huawei, China), Boyuan Chen (Centre for Software Excellence at Huawei, Canada), and Zhen Ming Jiang (York University, Canada)
DAISY: Effective Fuzz Driver Synthesis with Object Usage Sequence Analysis
Challenges in Adopting Artificial Intelligence Based User Input Verification Framework in Reporting Software Systems
Scalable Compositional Static Taint Analysis for Sensitive Data Tracing on Industrial Micro-Services
Simulation-Driven Automated End-to-End Test and Oracle Inference
StreamAI: Dealing with Challenges of Continual Learning Systems for Serving AI in Production
CONAN: Diagnosing Batch Failures for Cloud Systems

Please fix this Mutant: How do Developers Resolve Mutants Surfaced During Code Review? Goran Petrovic (Google Switzerland, Switzerland), Marko Ivankovic (Google Switzerland, Switzerland), Gordon Fraser (University of Passau, Germany), and René Just (University of Washington, USA)	150
Using Large-Scale Heterogeneous Graph Representation Learning for Code Review Recommendations at Microsoft	162
Widget Detection-Based Testing for Industrial Mobile Games Xiongfei Wu (Kyushu University, Japan), Jiaming Ye (Kyushu University, Japan), Ke Chen (Fuxi AI Lab of NetEase, China), Xiaofei Xie (Singapore Management University, Singapore), Yujing Hu (Fuxi AI Lab of NetEase, China), Ruochen Huang (University of Alberta, Canada), Lei Ma (University of Alberta, Canada; The University of Tokyo, Japan), and Jianjun Zhao (Kyushu University, Japan)	173
Towards More Effective AI-Assisted Programming: A Systematic Design Exploration to Improve Visual Studio IntelliCode's User Experience	185
Code Librarian: A Software Package Recommendation System	196
DocToModel: Automated Authoring of Models from Diverse Requirements Specification Documents Asha Rajbhoj (TCS Research, India), Padmalata Nistala (TCS Research, India), Vinay Kulkarni (TCS Research, India), Shivani Soni (TCS Research, India), and Ajim Pathan (TCS Research, India)	199
Investigating a NASA Cyclomatic Complexity Policy on Maintenance Risk of a Critical System Dan Port (University of Hawaii, USA), Bill Taber (Jet Propulsion Laboratory, California Institute of Technology, USA), and LiGuo Huang (Southern Methodist University, USA)	211
Aegis: Attribution of Control Plane Change Impact Across Layers and Components for Cloud Systems Xiaohan Yan (Microsoft Azure), Ken Hsieh (Microsoft Azure), Yasitha Liyanage (Microsoft Azure), Minghua Ma (Microsoft Research), Murali Chintalapati (Microsoft Azure), Qingwei Lin (Microsoft Research), Yingnong Dang (Microsoft Azure), and Dongmei Zhang (Microsoft Research)	222

An Empirical Study on Change-Induced Incidents of Online Service Systems	34
Fulfilling Industrial Needs for Consistency Among Engineering Artifacts 24 Luciano Marchezan (Institute of Software Systems Engineering - Johannes Kepler University Linz, Austria), Wesley Klewerton Guez Assunção (Institute of Software Systems Engineering - Johannes Kepler University Linz, Austria), Edvin Herac (Institute of Software Systems Engineering - Johannes Kepler University Linz, Austria), Felix Keplinger (Institute of Software Systems Engineering - Johannes Kepler University Linz, Austria), Alexander Egyed (Institute of Software Systems Engineering - Johannes Kepler University Linz, Austria), and Christophe Lauwerys (Corelab MotionS - Flanders Make, Belgium)	46
TraceArk: Towards Actionable Performance Anomaly Alerting for Online Service Systems	58
You Don't Know Search: Helping Users Find Code by Automatically Evaluating Alternative Queries	70
CFG2VEC: Hierarchical Graph Neural Network for Cross-Architectural Software Reverse Engineerin	81
Shih-Yuan Yu (University of California, Irvine, USA), Yonatan Gizachew Achamyeleh (University of California, Irvine, USA), Chonghan Wang (University of California, Irvine, USA), Anton Kocheturov (Siemens Technology, USA), Patrick Eisen (Siemens Technology, USA), and Mohammad Abdullah Al Faruque (University of California, Irvine, USA)	
Do Software Security Practices Yield Fewer Vulnerabilities? 29 Nusrat Zahan (North Carolina State University, USA), Shohanuzzaman Shohan (North Carolina State University, USA), Dan Harris (North Carolina State University, USA), and Laurie Williams (North Carolina State University, USA)	92
A/B Integrations7 Lessons Learned from Enabling A/B Testing as a Product Feature	Э4
Long-Term Static Analysis Rule Quality Monitoring Using True Negatives	15

A Language-Agnostic Framework for Mining Static Analysis Rules from Code Changes
The Challenges of Shift Left Static Analysis
Achieving Last-Mile Functional Coverage in Testing Chip Design Software Implementations343 Ming Yan (Tianjin University, China), Junjie Chen (Tianjin University, China), Hangyu Mao (Noah's Ark Lab, China), Jiajun Jiang (Tianjin University, China), Jianye Hao (Noah's Ark Lab, China), Xingjian Li (Tianjin University, China), Zhao Tian (Tianjin University, China), Zhichao Chen (Tianjin University, China), Dong Li (Noah's Ark Lab, China), Zhangkong Xian (Hisilicon, Huawei, China), Yanwei Guo (Hisilicon, Huawei, China), Wulong Liu (Noah's Ark Lab, China), Bin Wang (Noah's Ark Lab, China), Yuefeng Sun (Hisilicon, Huawei, China), and Yongshun Cui (Hisilicon, Huawei, China)
Auto-Tuning Elastic Applications in Production
Runtime Performance Prediction for Deep Learning Models with Graph Neural Network
Who Ate My Memory? Towards Attribution in Memory Management
Hybrid Cloudification of Legacy Software for Efficient Simulation of Gas Turbine Designs
Automated Misconfiguration Repair of Configurable Cyber-Physical Systems with Search: an Industrial Case Study on Elevator Dispatching Algorithms
Make Your Tools Sparkle with Trust: The PICSE Framework for Trust in Software Tools

Identifying Defect Injection Risks from Analysis and Design Diagrams: An Industrial Case Study at Sony
Understanding Why and Predicting When Developers Adhere to Code-Quality Standards
Code Compliance Assessment as a Learning Problem
An Empirical Study on Quality Issues of Deep Learning Platform
Automated Metamorphic Testing Using Transitive Relations for Specializing Stance Detection Models
Alisa Arno (IBM Research - Tokyo, Japan), Futoshi Iwama (IBM Research - Tokyo, Japan), and Mikio Takeuchi (IBM Research - Tokyo, Japan)
Incremental Call Graph Construction in Industrial Practice
Automated Test Case Generation for Safety-Critical Software in Scade
An Empirical Study of License Conflict in Free and Open Source Software
Author Index