2019 IEEE/ACM 16th International Conference on Mining Software Repositories (MSR 2019)

Montreal, Quebec, Canada 25-31 May 2019



IEEE Catalog Number: CFP1978C-POD ISBN:

978-1-7281-3370-6

Copyright © 2019 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:
 CFP1978C-POD

 ISBN (Print-On-Demand):
 978-1-7281-3370-6

 ISBN (Online):
 978-1-7281-3412-3

ISSN: 2574-3848

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



2019 IEEE/ACM 16th

International Conference on Mining Software Repositories (MSR)

MSR 2019

Table of Contents

Message from the Chairs of MSR 2019 xiv Organizing Committee for MSR 2019 xvii Program Committee xix Steering Committee xxx Additional Reviewers xxxiii Keynote Abstract xxxiv		
Representations for Minin	ag (Part 1)	
	mantics and Order 1and Avinash Kak (Purdue University)	
•		
Import2vec: Learning Embeddings for Bart Theeten (Nokia Bell Labs, Belg Bell Labs, Belgium), and Tom Van	• • • • • • • • • • • • • • • • • • • •	
	dentifier Embeddings .29 ity of Economics and Business) and ity of Economics and Business)	
Defect Prediction and Test	ting (Part 1)	
Thong Hoang (Singapore Managen (University of Wollongong), Yasuta	ng Framework for Just-in-Time Defect Prediction .34 nent University), Hoa Khanh Dam kka Kamei (Kyushu University), David rsity), and Naoyasu Ubayashi (Kyushu	

Lessons Learned from Using a Deep Tree-Based Model for Software Defect Prediction in Practice .46 Hoa Khanh Dam (University of Wollongong), Trang Pham (Deakin University), Shien Wee Ng (University of Wollongong), Truyen Tran (Deakin University), John Grundy (Monash University), Aditya Ghose (University of Wollongong), Taeksu Kim (Samsung Electronics), and Chul-Joo Kim (Samsung Electronics)
Empirical Study in using Version Histories for Change Risk Classification .58. Max Kiehn (Advanced Micro Devices, Inc.), Xiangyi Pan (Advanced Micro Devices, Inc.), and Fatih Camci (Amazon)
Snoring: A Noise in Defect Prediction Datasets .63
Representations for Mining (Part 2)
Exploring Word Embedding Techniques to Improve Sentiment Analysis of Software Engineering Texts .68 Eeshita Biswas (University of Delaware), K. Vijay-Shanker (University of Delaware), and Lori Pollock (University of Delaware)
Cleaning StackOverflow for Machine Translation 79. Musfiqur Rahman (Concordia University), Peter Rigby (Concordia University), Dharani Palani (Concordia University), and Tien Nguyen (The University of Texas at Dallas)
Predicting Good Configurations for GitHub and Stack Overflow Topic Models 84
Defect Prediction and Testing (Part 2)
A Dataset of Parametric Cryptographic Misuses .96
Does UML Modeling Associate with Lower Defect Proneness?: A Preliminary Empirical Investigation .101 Adithya Raghuraman (Carnegie Mellon University), Truong Ho-Quang (Chalmers Gothenburg University), Michel R. V. Chaudron (Chalmers Gothenburg University), Alexander Serebrenik (Eindhoven University of Technology), and Bogdan Vasilescu (Carnegie Mellon University)
STRAIT: A Tool for Automated Software Reliability Growth Analysis .105
A Data Set of Program Invariants and Error Paths 111. Dirk Beyer (LMU Munich)

Test Coverage in Python Programs 116. Hongyu Zhai (University of California, Davis), Casey Casalnuovo (University of California, Davis), and Prem Devanbu (University of California, Davis)
On the Effectiveness of Manual and Automatic Unit Test Generation: Ten Years Later .121
Education Track Tutorial I
Large-Scale Mining
Time Present and Time Past: Analyzing the Evolution of JavaScript Code in the Wild .126. Dimitris Mitropoulos (Athens University of Economics and Business), Panos Louridas (Athens University of Economics and Business), Vitalis Salis (Greek Research and Technology Network), and Diomidis Spinellis (Athens University of Economics and Business)
The Software Heritage Graph Dataset: Public Software Development Under One Roof 138
World of Code: An Infrastructure for Mining the Universe of Open Source VCS Data .1.43. Yuxing Ma (University of Tennessee), Chris Bogart (Carnegie Mellon University), Sadika Amreen (University of Tennessee), Russell Zaretzki (University of Tennessee), and Audris Mockus (University of Tennessee)
Crossflow: A Framework for Distributed Mining of Software Repositories .155. Dimitris Kolovos (University of York), Patrick Neubauer (University of York), Konstantinos Barmpis (University of York), Nicholas Matragkas (University of York), and Richard Paige (University of York)
Energy and Economics
Recommending Energy-Efficient Java Collections 160. Wellington de Oliveira Júnior (Federal University of Pernambuco), Renato Oliveira dos Santos (Federal University of Pernambuco), Fernando José Castor de Lima Filho (Federal University of Pernambuco), Benito Fernandes de Araújo Neto (Federal University of Pernambuco), and Gustavo Henrique Lima Pinto (Federal University of Pará)
GreenHub Farmer: Real-World Data for Android Energy Mining .1.7.1. Hugo Matalonga (Universidade do Minho, Portugal), Bruno Cabral (Universidade de Coimbra, Portugal; CISUC, Portugal), Fernando Castor (Universidade Federal de Pernambuco, Brasil), Marco Couto (Universidade do Minho, Portugal), Rui Pereira (Universidade da Beira Interior, Portugal), Simao Melo de Sousa (Universidade da Beira Interior, Portugal; LISP, Portugal), and Joao Paulo Fernandes (Universidade de Coimbra, Portugal; CISUC, Portugal)

GreenSource: A Large-Scale Collection of Android Code, Tests and Energy Metrics .1.76
Striking Gold in Software Repositories? An Econometric Study of Cryptocurrencies on GitHub .181
A Panel Data Set of Cryptocurrency Development Activity on GitHub .186. Rijnard van Tonder (Carnegie Mellon University), Asher Trockman (University of Evansville), and Claire Le Goues (Carnegie Mellon University)
Mining Challenge
SOTorrent: Studying the Origin, Evolution, and Usage of Stack Overflow Code Snippets .191
Mining Rule Violations in JavaScript Code Snippets .195 Uriel Ferreira Campos (Federal University of Pará), Guilherme Smethurst (Federal University of Pará), João Pedro Moraes (Federal University of Pará), Rodrigo Bonifácio (University of Brasília), and Gustavo Pinto (Federal University of Pará)
Snakes in Paradise?: Insecure Python-Related Coding Practices in Stack Overflow .200
Man vs Machine – A Study into Language Identification of Stack Overflow Code Snippets .205 Jens Dietrich (Victoria University of Wellington), Markus Luczak-Roesch (Victoria University of Wellington), and Elroy Dalefield (Victoria University of Wellington)
Python Coding Style Compliance on Stack Overflow 210
Towards Mining Answer Edits to Extract Evolution Patterns in Stack Overflow .2.15. Themistoklis Diamantopoulos (Aristotle University of Thessaloniki), Maria Ioanna Sifaki (Aristotle University of Thessaloniki), and Andreas Symeonidis (Aristotle University of Thessaloniki)
Analyzing Comment-Induced Updates on Stack Overflow .220
What Edits are Done on the Highly Answered Questions in Stack Overflow? An Empirical Study .225

Can Duplicate Questions on Stack Overflow Benefit the Software Development Community? .230
How Often and What StackOverflow Posts Do Developers Reference in Their GitHub Projects? .235
Characterizing Duplicate Code Snippets between Stack Overflow and Tutorials .240. Manziba Akanda Nishi (Virginia Commonwealth University), Agnieszka Ciborowska (Virginia Commonwealth University), and Kostadin Damevski (Virginia Commonwealth University)
Challenges with Responding to Static Analysis Tool Alerts .245 Nasif Imtiaz (North Carolina State University), Akond Rahman (North Carolina State University), Effat Farhana (North Carolina State university), and Laurie Williams (North Carolina State University)
Impact of Stack Overflow Code Snippets on Software Cohesion: A Preliminary Study .250
We Need to Talk About Microservices: an Analysis from the Discussions on StackOverflow .255
What do Developers Know About Machine Learning: A Study of ML Discussions on StackOverflow .260 Abdul Ali Bangash (University of Alberta), Hareem Sahar (University of Alberta), Shaiful Chowdhury (University of Alberta), Alexander William Wong (University of Alberta), Abram Hindle (University of Alberta), and Karim Ali (University of Alberta)
APIs & Dependencies (Part 1)
Investigating Next Steps in Static API-Misuse Detection 265. Amann Sven (CQSE GmbH), Hoan Anh Nguyen (Amazon.com, Inc), Sarah Nadi (University of Alberta), Tien N. Nguyen (University of Texas-Dallas), and Mira Mezini (Technische Universität Darmstadt)
Identifying Experts in Software Libraries and Frameworks Among GitHub Users .2.76. João Eduardo Montandon (Federal University of Minas Gerais), Luciana Lourdes Silva (Federal Institute of Minas Gerais), and Marco Tulio Valente (Federal University of Minas Gerais)
Data-Driven Solutions to Detect API Compatibility Issues in Android: An Empirical Study .288

Automatic Summarization

Generating Commit Messages from Diffs using Pointer-Generator Network .299. Qin Liu (Tongji University), Zihe Liu (Tongji University), Hongming Zhu (Tongji University), Hongfei Fan (Tongji University), Bowen Du (The University of Warwick), and Yu Qian (Tongji University)
Automatically Generating Documentation for Lambda Expressions in Java 3.10. Anwar Alqaimi (University of Adelaide), Patanamon Thongtanunam (University of Melbourne), and Christoph Treude (University of Adelaide)
Extracting API Tips from Developer Question and Answer Websites .321. Shaohua Wang (New Jersey Institute of Technology), NhatHai Phan (New Jersey Institute of Technology), Yan Wang (Central University of Finance and Economics, China), and Yong Zhao (New Jersey Institute of Technology)
APIs & Dependencies (Part 2)
The Emergence of Software Diversity in Maven Central 333 César Soto-Valero (KTH Royal Institute of Technology), Amine Benelallam (Univ Rennes, Inria, CNRS, IRISA), Nicolas Harrand (KTH Royal Institute of Technology), Olivier Barais (Univ Rennes, Inria, CNRS, IRISA), and Benoit Baudry (KTH Royal Institute of Technology)
The Maven Dependency Graph: A Temporal Graph-Based Representation of Maven Central 344
Dependency Versioning in the Wild .349. Jens Dietrich (Victoria University of Wellington), David Pearce (Victoria University of Wellington), Jacob Stringer (Massey University), Amjed Tahir (Massey University), and Kelly Blincoe (University of Auckland)
Splitting APIs: An Exploratory Study of Software Unbundling 360
Security
Automated Software Vulnerability Assessment with Concept Drift 37.1
A Manually-Curated Dataset of Fixes to Vulnerabilities of Open-Source Software 383. Serena Elisa Ponta (SAP Security Research), Henrik Plate (SAP Security Research), Antonino Sabetta (SAP Security Research), Michele Bezzi (SAP Security Research), and Cédric Dangremont (SAP)

Negative Results on Mining Crypto-API Usage Rules in Android Apps 388. Jun Gao (University of Luxembourg), Pingfan Kong (University of Luxembourg), Li Li (Monash University), Tegawendé F. Bissyandé (University of Luxembourg), and Jacques Klein (University of Luxembourg)
A Dataset of Non-Functional Bugs 399. Aida Radu (University of Alberta) and Sarah Nadi (University of Alberta)
RmvDroid: Towards A Reliable Android Malware Dataset with App Metadata 404. Haoyu Wang (Beijing University of Posts and Telecommunications), Junjun Si (Changan Communication Technology Co., LTD.), Hao Li (OrangeApk, Inc.), and Yao Guo (Peking University)
Collaboration & Communication (Part 1)
An Empirical Study of Multiple Names and Email Addresses in OSS Version Control Repositories .409 Jiaxin Zhu (Institute of Software, Chinese Academy of Sciences) and Jun Wei (Institute of Software, Chinese Academy of Sciences)
Characterizing the Roles of Contributors in Open-Source Scientific Software Projects .421
git2net - Mining Time-Stamped Co-Editing Networks from Large git Repositories .433
Software Quality (part 1)
The Rise of Android Code Smells: Who is to Blame? 445
Assessing Diffusion and Perception of Test Smells in Scala Projects .457
Style-Analyzer: Fixing Code Style Inconsistencies with Interpretable Unsupervised Algorithms .468
Collaboration & Communication (Part 2)
Can Issues Reported at Stack Overflow Questions be Reproduced? An Exploratory Study 479

Exploratory Study of Slack Q&A Chats as a Mining Source for Software Engineering Tools .490
Impacts of Daylight Saving Time on Software Development .502
Software Quality (part 2)
A Large-Scale Study About Quality and Reproducibility of Jupyter Notebooks .507
Cross-Language Clone Detection by Learning Over Abstract Syntax Trees .518. Daniel Perez (Imperial College London) and Shigeru Chiba (The University of Tokyo)
SeSaMe: A Data Set of Semantically Similar Java Methods .529
Education Track Tutorial II
Traceability
Predicting Co-Changes between Functionality Specifications and Source Code in Behavior Driven Development .534
Tracing Back Log Data to its Log Statement: From Research to Practice .545
Beyond GumTree: A Hybrid Approach to Generate Edit Scripts .550. Junnosuke Matsumoto (Osaka University), Yoshiki Higo (Osaka University), and Shinji Kusumoto (Osaka University)
The Impact of Systematic Edits in History Slicing .555
Scalable Software Merging Studies with MERGANSER .560

Building on Data

Standing on Shoulders or Feet? The Usage of the MSR Data Papers .565. Zoe Kotti (Athens University of Economics and Business) and Diomidis Spinellis (Athens University of Economics and Business)
Boa Meets Python: A Boa Dataset of Data Science Software in Python Language .5.77. Sumon Biswas (Iowa State University), Md Johirul Islam (Iowa State University), Yijia Huang (Iowa State University), and Hridesh Rajan (Iowa State University)
A Benchmark of Data Loss Bugs for Android Apps .582
RapidRelease - A Dataset of Projects and Issues on Github with Rapid Releases .587
ConPan: A Tool to Analyze Packages in Software Containers .592
An Empirical History of Permission Requests and Mistakes in Open Source Android Apps .597
Author Index 603