Welcome from the Chairs........................................................................................................................................ xii
Organization ......................................................................................................................................................... xiv
Steering Committee ............................................................................................................................................... xv
Program Committee ............................................................................................................................................. xvi
Additional Reviewers ....................................................................................................................................... xix
Sponsors and Supporters .................................................................................................................................... xx

What’s fast, green, and sounds like a robot?

Studying the Effectiveness of Application Performance Management (APM) Tools for Detecting Performance Regressions for Web Applications: An Experience Report ................................................................. 1
  Tarek M. Ahmed, Cor-Paul Bezemer, Tse-Hsun Chen, Ahmed E. Hassan, and Weiyi Shang
  — Queen’s University, Canada; Concordia, Canada

Mining Test Repositories for Automatic Detection of UI Performance Regressions in Android Apps ........................................................................................................................................... 13
  Maria Gomez, Romain Rouvoy, Bram Adams, and Lionel Seinturier
  — INRIA, France; University of Lille, France; MCIS, École Polytechnique de Montréal, Canada

Mining Performance Regression Inducing Code Changes in Evolving Software .............................................. 25
  Qi Luo, Denys Poshyvanyk, and Mark Grechanik
  — The College of William and Mary, USA; University of Illinois at Chicago, USA

  Lingfeng Bao, David Lo, Xin Xia, Xinyu Wang, and Cong Tian
  — Zhejiang University, China; Singapore Management University, Singapore; Xidian University, China

  Shaiful Alam Chowdhury and Abram Hindle
  — University of Alberta, Canada

Plus ça change ...

Automatic Clustering of Code Changes.............................................................................................................. 61
  Patrick Kreutzer, Georg Dotzler, Matthias Ring, Bjoern M. Eskofier, and Michael Philippsen
  — Friedrich-Alexander University Erlangen-Nürnberg, Germany
Improving Change Recommendation using Aggregated Association Rules .............................................. 73
  Thomas Rolfnes, Leon Moonen, Stefano Di Alesio, Razieh Behjati, and Dave Binkley
  — Simula Research Laboratory, Norway; Loyola University Maryland, USA

FEVER: Extracting Feature-oriented Changes from Commits ........................................................................... 85
  Nicolas Dintzner, Arie van Deursen, and Martin Pinzger
  — Delft University of Technology, Netherlands; University of Klagenfurt, Austria

Tools of the trade

Adressing Problems with External Validity of Repository Mining Studies
Through a Smart Data Platform ..................................................................................................................... 97
  Fabian Trautsch, Steffen Herbold, Philip Makedonski, and Jens Grabowski
  — University of Goettingen, Germany

Comparing Repositories Visually with RepoGrams .................................................................................. 109
  Daniel Rozenberg, Ivan Beschastnikh, Fabian Kosmale, Valerie Poser, Heiko Becker,
  Marc Palyart, and Gail C. Murphy
  — University of British Columbia, Canada; Saarland University, Germany

Orphans (read: novel!)

Raising MSR Researchers: An Experience Report on Teaching a Graduate Seminar
Course in Mining Software Repositories (MSR) ........................................................................................... 121
  Ahmed E. Hassan
  — Queen's University, Canada

Interactive Exploration of Developer Interaction Traces using a Hidden Markov Model .................. 126
  Kostadin Damevski, Hui Chen, David Shepherd, and Lori Pollock
  — Virginia Commonwealth University, USA; Virginia State University, USA; ABB, Inc, USA;
  University of Delaware, USA

Findings from GitHub: Methods, Datasets and Limitations ....................................................................... 137
  Valerio Cosentino, Javier Luis Cánovas Izquierdo, and Jordi Cabot
  — Atlanmod, Inria, Lina, Mines Nantes, France; UOC, Barcelona, Spain;
  ICREA, UOC, Barcelona, Spain

Cold-Start Software Analytics ................................................................................................................... 142
  Jin Guo, Mona Rahimi, Jane Cleland-Huang, Alexander Rasin, Jane Huffman Hayes,
  and Michael Vierhauser
  — DePaul University, USA; University of Kentucky, USA; Johannes Kepler University, Austria

Logging Library Migrations: A Case Study for the Apache Software Foundation Projects ............ 154
  Suhas Kabinna, Cor-Paul Bezemer, Weiyi Shang, and Ahmed E. Hassan
  — Queen's University, Canada; Concordia University, Canada
The Devil is in the Details (Source Code Mining)

An Empirical Study on the Practice of Maintaining Object-Relational Mapping Code in Java Systems ........................................................................................................................................ 165
Tse-Hsun Chen, Weiyi Shang, Jinqiu Yang, Ahmed E. Hassan, Michael W. Godfrey, Mohamed Nasser, and Parminder Flora
— Queen's University, Canada; Concordia University, Canada; University of Waterloo, Canada; BlackBerry, Canada

Inter-app Communication in Android: Developer Challenges ........................................................................................................... 177
Waqar Ahmad, Christian Kästner, Joshua Sunshine, and Jonathan Aldrich
— Carnegie Mellon University, USA

Does Your Configuration Code Smell? ................................................................................................................................. 189
Tushar Sharma, Marios Fragkoulis, and Diomidis Spinellis
— AUEB, Greece

Feature Toggles: Practitioner Practices and a Case Study ........................................................................................................... 201
Md Tajmilur Rahman, Louis-Philippe Querel, Peter C. Rigby, and Bram Adams
— Concordia University, Canada; Polytechnique Montreal, Canada

Understanding the Exception Handling Strategies of Java Libraries: An Empirical Study .................................................... 212
Demóstenes Sena, Roberta Coelho, Uirá Kulesza, and Rodrigo Bonifácio
— Federal Institute of Education, Science and Technology of Rio Grande do Norte, Brazil; Federal University of Rio Grande do Norte, Brazil; University of Brasília, Brazil

Text Mining: Norms, Feelings, Youtube, and Crashes

Externalization of Software Behavior by the Mining of Norms ........................................................................................................... 223
Daniel Avery, Hoa Khanh Dam, Bastin Tony Roy Savarimuthu, and Aditya Ghose
— University of Wollongong, Australia; University of Otago, New Zealand

Sentiment Analysis in Tickets for IT Support .................................................................................................................. 235
Cássio Castaldi Araujo Blaz, and Karin Becker
— Universidade Federal do Rio Grande do Sul, Brazil

Mining Valence, Arousal, and Dominance - Possibilities for Detecting Burnout and Productivity? .................................................. 247
Mika Mantyla, Bram Adams, Giuseppe Destefanis, Daniel Graziotin, and Marco Ortu
— University of Oulu, Finland; MCIS, École Polytechnique de Montréal, Canada; Brunel University London, United Kingdom; University of Stuttgart, Germany; DIEE - Department of Electrical and Electronic Engineering, Italy

On Mining Crowd-Based Speech Documentation .................................................................................................................. 259
Parisa Moslehi, Bram Adams, and Juergen Rilling
— Concordia University, Canada; MCIS, Polytechnique Montréal, Canada

The Unreasonable Effectiveness of Traditional Information Retrieval in Crash Report Deduplication ........................................................................................................... 269
Joshua Charles Campbell, Eddie Antonio Santos, and Abram Hindle
— University of Alberta, Canada
I’ve got issues ... and debt :-(

How Software Developers Use Work Breakdown Relationships in Issue Repositories .................. 281
C. Albert Thompson, Gail C. Murphy, Marc Palyart, and Marko Gašparic
— University of British Columbia, Canada; Free University of Bolzano, Canada

Locating Bugs without Looking Back ............................................................................................ 286
Tezcan Dilshener, Michel Wermelinger, and Yijun Yu
— The Open University, Germany; The Open University, United Kingdom

Using Dynamic and Contextual Features to Predict Issue Lifetime in GitHub Projects .................. 291
Riivo Kikas, Marlon Dumas, and Dietmar Pfahl
— University of Tartu, Estonia

Topic Modeling of NASA Space System Problem Reports: Research in Practice ......................... 303
Lucas Layman, Allen P. Nikora, Joshua Meek, and Tim Menzies
— Fraunhofer Center for Experimental Software Engineering, USA; Jet Propulsion Laboratory,
California Institute of Technology, USA; NC State, CS, USA

A Large-Scale Empirical Study on Self-Admitted Technical Debt .............................................. 315
Gabriele Bavota and Barbara Russo
— Free University of Bozen-Bolzano, Italy

Got Technical Debt? Surfacing Elusive Technical Debt in Issue Trackers ....................................... 327
Stephany Bellomo, Robert L. Nord, İpek Ozkaya, and Mary Popeck
— Carnegie Mellon Software Engineering Institute, USA

Yuugge! Mining

Takashi Ishio, Raula Gaikovina Kula, Tetsuya Kanda, Daniel M. German,
and Katsuro Inoue
— Osaka University, Japan; University of Victoria, Canada

A Look at the Dynamics of the JavaScript Package Ecosystem ...................................................... 351
Erik Wittern, Philippe Suter, and Shriram Rajagopalan
— IBM Research, USA; IBM T.J. Watson Research Center, USA

A Large-Scale Study on Repetitiveness, Containment, and Composability of Routines in Open-Source Projects ................................................................. 362
Anh Tuan Nguyen, Hoan Anh Nguyen, and Tien N. Nguyen
— Iowa State University, USA

Process Improvement

The Impact of Switching to a Rapid Release Cycle on the Integration Delay of Addressed
Issues - An Empirical Study of the Mozilla Firefox Project ............................................................. 374
Daniel Alencar da_Costa, Shane McIntosh, Uirá Kulesza, and Ahmed E. Hassan
— Federal University of Rio Grande do Norte, Brazil; McGill University, Canada;
Queen’s University, Canada
Daniel Izquierdo-Cortazar, Lars Kurth, Jesús M. González-Barahona, Santiago Dueñas, and Nelson Sekitoleko
— Bitergia, Spain; Xen Project / Citrix, United Kingdom; Universidad Rey Juan Carlos, Spain

This session's gonna overflow

From Query to Usable Code: An Analysis of Stack Overflow Code Snippets ................................................. 391
Di Yang, Aftab Hussain, and Cristina Videira Lopes
— University of California, Irvine, USA

Mining Duplicate Questions of Stack Overflow ............................................................................................. 402
Muhammad Ahasanuzzaman, Muhammad Asaduzzaman, Chanchal K. Roy, and Kevin A. Schneider
— University of Dhaka, Bangladesh; University of Saskatchewan, Canada

Domain-Specific Cross-Language Relevant Question Retrieval ...................................................................... 413
Bowen Xu, Zhenchang Xing, Xin Xia, David Lo, Qingye Wang, Shanping Li
— Zhejiang University, China; Nanyang Technological University, Singapore; Singapore Management University, Singapore

Recognizing Gender of Stack Overflow Users .............................................................................................. 425
Bin Lin and Alexander Serebrenik
— Eindhoven University of Technology, Netherlands

Grouping Android Tag Synonyms on Stack Overflow .................................................................................. 430
Stefanie Beyer and Martin Pinzger
— University of Klagenfurt, Austria

How the R Community Creates and Curates Knowledge: A Comparative Study of Stack Overflow and Mailing Lists ................................................................................................................. 441
Alexey Zagalsky, Carlos Gómez Teshima, Daniel M. German, Margaret-Anne Storey, and Germán Poo-Caamaño
— University of Victoria, Canada

Data Showcase

Data Sets: The Circle of Life in Ruby Hosting, 2003-2015 ............................................................................. 452
Megan Squire
— Elon University, USA

Mining the Modern Code Review Repositories: A Dataset of People, Process and Product ...................... 460
Xin Yang, Raula Gaikovina Kula, Norihiro Yoshida, and Hajimu Iida
— Nara Institute of Science and Technology (NAIST), Japan; Osaka University, Japan; Nagoya University, Japan

MUBench: A Benchmark for API-Misuse Detectors .................................................................................... 464
Sven Amann, Sarah Nadi, Hoan A. Nguyen, Tien N. Nguyen, and Mira Mezini
— Technische Universität Darmstadt, Germany; Iowa State University, USA
Challenge

Examining Programmer Practices for Locally Handling Exceptions ............................................................ 484
Mary Beth Kery, Claire Le Goues, and Brad A. Myers
— School of Computer Science, Carnegie Mellon University, USA

QualBoa: Reusability-aware Recommendations of Source Code Components.................................................... 488
Themistoklis Diamantopoulos, Klearchos Thomopoulos, and Andreas Symeonidis
— Aristotle University of Thessaloniki, Greece

The Dispersion of Build Maintenance Activity across Maven Lifecycle Phases .................................................... 492
Casimir De’sarmeaux, Andrea Pecatikov, and Shane McIntosh
— McGill University, Canada

The Relationship between Commit Message Detail and Defect Proneness in Java Projects on GitHub .............................................................................................................................................. 496
— McGill University, Canada

Analysis of Exception Handling Patterns in Java Projects: An Empirical Study ................................................. 500
Suman Nakshatri, Maithri Hegde, and Sahithi Thandra
— University of Waterloo, Canada

Judging a Commit by Its Cover: Correlating Commit Message Entropy with Build Status on Travis-CI ............................................................................................................................................... 504
Eddie Antonio Santos and Abram Hindle
— University of Alberta, Canada

Characterizing Energy-Aware Software Projects: Are They Different? ................................................................. 508
Shaiful Alam Chowdhury and Abram Hindle
— University of Alberta, Canada

A Deeper Look into Bug Fixes: Patterns, Replacements, Deletions, and Additions ................................................ 512
Mauricio Soto, Ferdian Thung, Chu-Pan Wong, Claire Le Goues, and David Lo
— Carnegie Mellon University, USA; Singapore Management University, Singapore