

Michael Pradel

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Research Interests

My research focuses on tools and techniques for building reliable, efficient, and secure software. To this end, I work on testing and analysis of complex software systems. As part of my research, I have contributed to techniques that detected thousands of bugs and security problems in widely used software.

Positions and Experience

- Sep 2019 – **University of Stuttgart, Germany.**
now Full Professor
- Feb 2019 – **Facebook, Menlo Park, USA.**
Jul 2019 Sabbatical/industrial leave
- Oct 2014 – **TU Darmstadt, Germany.**
Aug 2019 Assistant Professor (since April 2017, before: Independent research group leader)
- Sep 2013 – **University of California, Berkeley, USA.**
Aug 2014 Postdoctoral researcher
- Jan 2013 – **ETH Zurich, Switzerland.**
Jun 2013 Postdoctoral researcher and lecturer in the Laboratory for Software Technology lead by Thomas Gross
- 2008 – 2012 **ETH Zurich, Switzerland.**
Research assistant in the Laboratory for Software Technology lead by Thomas Gross
- Aug 2006 – **Fraunhofer Institute for Secure Information Technology SIT, Darmstadt, Germany.**
Sep 2006 Internship. Survey of static source code analysis tools. Study on Ajax-related security issues
- Jul 2005 – **Computer science research center FZI, Karlsruhe, Germany.**
Aug 2005 Internship. Developed a Java application to visualize large object-oriented software
- 2001 – 2002 **Community service, Jena, Germany.**
Day-care center for disabled children

Education

- 2008 – 2012 **ETH Zurich, Switzerland.**
Ph.D. (Dr. sc.) in computer science. Laboratory for Software Technology lead by Thomas Gross.
Dissertation: *Program Analyses for Automatic and Precise Error Detection.*
Software Engineering Award of the Ernst-Denert-Foundation (best dissertation)
Examinors: Thomas Gross, Jonathan Aldrich, Andreas Zeller
- Jan 2008 – **Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.**
Jul 2008 Diploma thesis in the Programming Methods Laboratory lead by Martin Odersky.
Best student paper award at ICSoft'08
- 2006 – 2008 **TU Dresden, Germany.**
Diplom (\approx M.S.) in computer science, with distinction. Specialization: software engineering.
Awarded as one of the best engineering graduates of the year
- 2004 – 2006 **Ecole Centrale Paris, France.**
Diplôme d'Ingénieur (\approx M.S.) in engineering
- 2002 – 2004 **TU Dresden, Germany.**
Vordiplom (\approx B.S.) in computer science

Peer-reviewed Conference Publications

- ASE'20 **No Strings Attached: An Empirical Study of String-related Software Bugs.**
Aryaz Eghbali, Michael Pradel. *International Conference on Automated Software Engineering*
- USENIX Security'20 **Everything Old is New Again: Binary Security of WebAssembly.**
Daniel Lehmann, Johannes Kinder, Michael Pradel. *USENIX Security Symposium*
- FSE'20 **TypeWriter: Neural Type Prediction with Search-based Validation.**
Michael Pradel, Georgios Gousios, Jason Liu, Satish Chandra. *Symposium on the Foundations of Software Engineering*
- ISSTA'20 **Scaffle: Bug Localization on Millions of Files.**
Michael Pradel, Vijayaraghavan Murali, Rebecca Qian, Mateusz Machalica, Erik Meijer, Satish Chandra. *International Symposium on Software Testing and Analysis*
- ICSE'20 **Extracting Taint Specifications for JavaScript Libraries.**
Cristian-Alexandru Staicu, Martin Toldam Torp, Max Schäfer, Anders Møller, Michael Pradel. *International Conference on Software Engineering*
- OOPSLA'19 **Getafix: Learning to Fix Bugs Automatically.**
Johannes Bader, Andrew Scott, Michael Pradel, Satish Chandra. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*
- ISSTA'19 **Interactive Metamorphic Testing of Debuggers.**
Sandro Tolksdorf, Daniel Lehmann, Michael Pradel. *International Symposium on Software Testing and Analysis*
- USENIX Security'19 **Small World with High Risks: A Study of Security Threats in the npm Ecosystem.**
Markus Zimmermann, Cristian-Alexandru Staicu, Cam Tenny, Michael Pradel. *USENIX Security Symposium*
- USENIX Security'19 **Leaky Images: Targeted Privacy Attacks in the Web.**
Cristian-Alexandru Staicu, Michael Pradel. *USENIX Security Symposium*
- WWW'19 **Anything to Hide? Studying Minified and Obfuscated Code in the Web.**
Philippe Skolka, Cristian-Alexandru Staicu, Michael Pradel. *The Web Conference (WWW)*
- ICSE'19 **NL2Type: Inferring JavaScript Function Types from Natural Language Information.**
Rabee Sohail Malik, Jibesh Patra, Michael Pradel. *International Conference on Software Engineering*
- ASPLOS'19 **Wasabi: A Framework for Dynamically Analyzing WebAssembly.**
Daniel Lehmann, Michael Pradel. *International Conference on Architectural Support for Programming Languages and Operating Systems*
- OOPSLA'18 **DeepBugs: A Learning Approach to Name-based Bug Detection.**
Michael Pradel, Koushik Sen. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*
- OOPSLA'18 **Test Generation for Higher-Order Functions in Dynamic Languages.**
Marija Selakovic, Michael Pradel, Rezwana Karim Nawrin, Frank Tip. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*
- ASE'18 **How Many of All Bugs Do We Find? A Study of Static Bug Detectors.**
Andrew Habib, Michael Pradel. *International Conference on Automated Software Engineering*
- ASE'18 **Is This Class Thread-Safe? Inferring Documentation using Graph-based Learning.**
Andrew Habib, Michael Pradel. *International Conference on Automated Software Engineering*
- FSE'18 **Feedback-Directed Differential Testing of Interactive Debuggers.**
Daniel Lehmann, Michael Pradel. *European Software Engineering Conference and Symposium on the Foundations of Software Engineering*
- ICSME'18 **Change-aware Dynamic Program Analysis for JavaScript.**
Dileep R. K. Murthy, Michael Pradel. *International Conference on Software Maintenance and Evolution*
- USENIX Security'18 **Freezing the Web: A Study of ReDoS Vulnerabilities in JavaScript-based Web Servers.**
Cristian-Alexandru Staicu, Michael Pradel. *USENIX Security Symposium*
- ICSE'18 **ConflictJS: Finding and Understanding Conflicts Between JavaScript Libraries.**
Jibesh Patra, Pooja N. Dixit, Michael Pradel. *International Conference on Software Engineering*
- NDSS'18 **Synode: Understanding and Automatically Preventing Injection Attacks on Node.js.**
Cristian-Alexandru Staicu, Michael Pradel, Ben Livshits. *Network and Distributed System Security Symposium*

- CGO'18 **Synthesizing Programs that Expose Performance Bottlenecks.**
Luca Della Toffola, Michael Pradel, Thomas R. Gross. *International Symposium on Code Generation and Optimization*, pages 314–326
- ASE'17 **Automatically Reducing Tree-Structured Test Inputs.**
Satia Herfert, Jibesh Patra, Michael Pradel. *International Conference on Automated Software Engineering*, pages 861–871
- ASE'17 **Saying “hi!” Is Not Enough: Mining Inputs for Effective Test Generation.**
Luca Della Toffola, Cristian-Alexandru Staicu, Michael Pradel. *International Conference on Automated Software Engineering*, pages 44–49
- OOPSLA'17 **Detecting Argument Selection Defects.**
Andrew Rice, Edward Aftandilian, Ciera Jaspan, Emily Johnston, Michael Pradel, Yulissa Arroyo-Paredes. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*, pages 104:1–104:22
- PLDI'17 **Systematic Black-Box Analysis of Collaborative Web Applications.**
Marina Billes, Anders Møller, Michael Pradel. *Conference on Programming Language Design and Implementation*, pages 171–184
- ISSTA'17 **An Actionable Performance Profiler for Optimizing the Order of Evaluations.**
Marija Selakovic, Thomas Glaser, Michael Pradel. *International Symposium on Software Testing and Analysis*, pages 170–180
- ICSE'17 **Making Malory Behave Maliciously: Targeted Fuzzing of Android Execution Environments.**
Siegfried Rasthofer, Steven Arzt, Stefan Triller, Michael Pradel. *International Conference on Software Engineering*, pages 300–311
- ICSE'17 **Efficient Detection of Thread Safety Violations via Coverage-Guided Generation of Concurrent Tests.**
Ankit Choudhary, Shan Lu, Michael Pradel. *International Conference on Software Engineering*, pages 266–277
- ICSE'16 **Performance Issues and Optimizations in JavaScript: An Empirical Study.**
Marija Selakovic, Michael Pradel. *International Conference on Software Engineering*, pages 61–72
- ICSE'16 **Nomen Est Omen: Exploring and Exploiting Similarities between Argument and Parameter Names.**
Hui Liu, Qiurong Liu, Cristian-Alexandru Staicu, Michael Pradel, Yue Luo. *International Conference on Software Engineering*, pages 1063–1073
- ISSTA'16 **Monkey See, Monkey Do: Effective Generation of GUI Tests with Inferred Macro Events.**
Markus Ermuth, Michael Pradel. *International Symposium on Software Testing and Analysis*, pages 82–93
- ISSTA'16 **SyncProf: Detecting, Localizing, and Optimizing Synchronization Bottlenecks.**
Tingting Yu, Michael Pradel. *International Symposium on Software Testing and Analysis*, pages 389–400
- OOPSLA'15 **Performance Problems You Can Fix: A Dynamic Analysis of Memoization Opportunities.**
Luca Della Toffola, Michael Pradel, Thomas R. Gross. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*, pages 607–622
- FSE'15 **JITProf: Pinpointing JIT-Unfriendly JavaScript Code.**
Liang Gong, Michael Pradel, Koushik Sen. *European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, pages 357–368
- ISSTA'15 **DLint: Dynamically Checking Bad Coding Practices in JavaScript.**
Liang Gong, Michael Pradel, Manu Sridharan, Koushik Sen. *International Symposium on Software Testing and Analysis*, pages 94–105
- ECOOP'15 **The Good, the Bad, and the Ugly: An Empirical Study of Implicit Type Conversions in JavaScript.**
Michael Pradel, Koushik Sen. *European Conference on Object-Oriented Programming*, pages 519–541
- ICSE'15 **TypeDevil: Dynamic Type Inconsistency Analysis for JavaScript.**
Michael Pradel, Parker Schuh, Koushik Sen. *International Conference on Software Engineering*, pages 314–324

- OOPSLA'14 **EventBreak: Analyzing the Responsiveness of User Interfaces through Performance-Guided Test Generation.**
Michael Pradel, Parker Schuh, George Necula, Koushik Sen. *Conference on Object-Oriented Programming, Systems, Languages, and Applications*, pages 33-47
- ISSTA'14 **Performance Regression Testing of Concurrent Classes.**
Michael Pradel, Markus Huggler, Thomas R. Gross. *International Symposium on Software Testing and Analysis*, pages 13-25
- ASE'13 **Bita: Coverage-guided, Automatic Testing of Actor Programs.**
Samira Tasharofi, Michael Pradel, Yu Lin, Ralph Johnson. *International Conference on Automated Software Engineering*, pages 114-224
- ICSE'13 **Automatic Testing of Sequential and Concurrent Substitutability.**
Michael Pradel, Thomas R. Gross. *International Conference on Software Engineering*, pages 282-291
- PLDI'12 **Fully Automatic and Precise Detection of Thread Safety Violations.**
Michael Pradel, Thomas R. Gross. *Conference on Programming Language Design and Implementation*, pages 521-530
- ISSTA'12 **Static Detection of Brittle Parameter Typing.**
Michael Pradel, Severin Heiniger, Thomas R. Gross. *International Symposium on Software Testing and Analysis*, pages 265-275
- ICSE'12 **Leveraging Test Generation and Specification Mining for Automated Bug Detection without False Positives.**
Michael Pradel, Thomas R. Gross. *International Conference on Software Engineering*, pages 288-298
- ICSE'12 **Statically Checking API Protocol Conformance with Mined Multi-Object Specifications.**
Michael Pradel, Ciera Jaspan, Jonathan Aldrich, Thomas R. Gross. *International Conference on Software Engineering*, pages 925-935
- ICSE'12 **Ballerina: Automatic Generation and Clustering of Efficient Random Unit Tests for Multithreaded Code.**
Adrian Nistor, Qingzhou Luo, Michael Pradel, Thomas R. Gross, Darko Marinov. *International Conference on Software Engineering*, pages 727-737
- ISSTA'11 **Detecting Anomalies in the Order of Equally-typed Method Arguments.**
Michael Pradel, Thomas R. Gross. *International Symposium on Software Testing and Analysis*, pages 232-242
- ICSM'10 **A Framework for the Evaluation of Specification Miners Based on Finite State Machines.**
Michael Pradel, Philipp Bichsel, Thomas R. Gross. *International Conference on Software Maintenance*, pages 1-10
- ASE'09 **Automatic Generation of Object Usage Specifications from Large Method Traces.**
Michael Pradel, Thomas R. Gross. *International Conference on Automated Software Engineering*, pages 371-382
- ICSOFT'08 **Scala Roles - A Lightweight Approach towards Reusable Collaborations.**
Michael Pradel, Martin Odersky. *International Conference on Software and Data Technologies*, pages 13-20. *Best student paper award*
- RR'08 **Ontology Design and Reuse with Conceptual Roles.**
Jakob Henriksson, Michael Pradel, Steffen Zschaler, Jeff Z. Pan. *International Conference on Web Reasoning and Rule Systems*, pages 104-118

Peer-reviewed Journal Publications and Book Chapters

- 2020 **Satisfying Increasing Performance Requirements with Caching at the Application Level.**
Jhonny Mertz, Ingrid Nunes, Luca Della Toffola, Marija Selakovic, Michael Pradel. *IEEE Software*
- 2019 **Automated Program Repair.**
Claire Le Goues, Michael Pradel, Abhik Roychoudhury. *Communications of the ACM*, 62(12), pages 56-65
- A Survey of Compiler Testing.**
Junjie Chen, Jibesh Patra, Michael Pradel, Yingfei Xiong, Hongyu Zhang, Dan Hao, Lu Zhang. *ACM Computing Surveys*, 53(1), pages 1-36

- 2017 **A Survey of Dynamic Analysis and Test Generation for JavaScript.**
 Esben Andreasen, Liang Gong, Anders Møller, Michael Pradel, Marija Selakovic, Koushik Sen, Cristian-Alexandru Staicu. *ACM Computing Surveys (CSUR)*, 50(5), pages 1–36
- Pinpointing and Repairing Performance Bottlenecks in Concurrent Programs.**
 Tingting Yu, Michael Pradel. *Empirical Software Engineering (EMSE)*, 23(5), pages 3034–3071
- 2013 **Name-based Analysis of Equally Typed Method Arguments.**
 Michael Pradel, Thomas R. Gross. *IEEE Transactions on Software Engineering (TSE)*, 39(8), pages 1127–1143
- 2011 **Mining API Usage Protocols from Large Method Traces.**
 Michael Pradel, Thomas R. Gross. *Mining Software Specifications: Methodologies and Applications*, pages 85–112. Edited by David Lo, Khoo Siau Cheng, Jiawei Han, and Chao Liu. CRC Press
- 2010 **A Good Role Model for Ontologies: Collaborations.**
 Michael Pradel, Jakob Henriksson, Uwe Aßmann. *International Journal of Enterprise Information Systems*, 6(1), pages 1–11

Technical Reports, Workshops, and Other Writings

- 2020 **Neural Software Analysis.**
 Michael Pradel, Satish Chandra.
- Mir: Automated Quantifiable Privilege Reduction Against Dynamic Library Compromise in JavaScript.**
 Nikos Vasilakis, Cristian-Alexandru Staicu, Greg Ntousakis, Konstantinos Kallas, Ben Karel, André DeHon, Michael Pradel.
- 2019 **An Empirical Study of Information Flows in Real-World JavaScript.**
 Cristian-Alexandru Staicu, Daniel Schoepe, Musard Balliu, Michael Pradel, Andrei Sabelfeld. ACM SIGSAC Workshop on Programming Languages and Analysis for Security (PLAS).
- Neural Bug Finding: A Study of Opportunities and Challenges.**
 Andrew Habib, Michael Pradel. Technical Report.
- Easy to Fool? Testing the Anti-evasion Capabilities of PDF Malware Scanners.**
 Saeed Ehteshamifar, Antonio Barresi, Thomas R. Gross, Michael Pradel. Technical Report.
- 2018 **Deep Learning to Find Bugs.**
 Michael Pradel, Koushik Sen. Technical Report No. TUD-CS-2017-0295. TU Darmstadt.
- Context2Name: A Deep Learning-Based Approach to Infer Natural Variable Names from Usage Contexts.**
 Rohan Bavishi, Michael Pradel, Koushik Sen. Technical Report No. TUD-CS-2017-0296. TU Darmstadt.
- 2017 **Automated Program Repair (Dagstuhl Seminar 17022).**
 Sunghun Kim, Claire Le Goues, Michael Pradel, Abhik Roychoudhury
- Front Matter - ECOOP 2017, Artifact Evaluation.**
 Philipp Haller, Michael Pradel, Tijs van der Storm
- 2016 **Understanding and Automatically Preventing Injection Attacks on Node.js.**
 Cristian-Alexandru Staicu, Michael Pradel, Ben Livshits. Technical Report No. TUD-CS-2016-14663. TU Darmstadt.
- Learning to Fuzz: Application-Independent Fuzz Testing with Probabilistic, Generative Models of Input Data.**
 Jibesh Patra, Michael Pradel. Technical Report No. TUD-CS-2016-14664. TU Darmstadt.
- Language-Independent Fuzz Testing with Probabilistic, Generative Models.**
 Jibesh Patra, Michael Pradel. *European Conference on Object-Oriented Programming (ECOOP) Distinguished Poster Award*
- 2015 **Performance Issues and Optimizations in JavaScript: An Empirical Study.**
 Marija Selakovic, Michael Pradel. Technical Report No. TUD-CS-2015-1249. TU Darmstadt. Superseded by ICSE'16 paper.
- Automatically Fixing Real-World JavaScript Performance Bugs.**
 Marija Selakovic, Michael Pradel. *International Conference on Software Engineering (ICSE)*, poster track.
- DLint: Dynamically Checking Bad Coding Practices in JavaScript.**
 Liang Gong, Michael Pradel, Manu Sridharan, Koushik Sen. Technical Report No. UCB/EECS-2015-5. University of California, Berkeley. Superseded by ISSTA'15 paper.

- 2014 **TypeDevil: Dynamic Type Inconsistency Analysis for JavaScript.**
Michael Pradel, Parker Schuh, Koushik Sen. Technical Report No. UCB/EECS-2014-171. University of California, Berkeley. Superseded by ICSE'15 paper.
- JITProf: Pinpointing JIT-unfriendly JavaScript Code.**
Liang Gong, Michael Pradel, Koushik Sen. Technical Report No. UCB/EECS-2014-144. University of California, Berkeley
- 2008 **Explicit Relations with Roles - A Library Approach.**
Michael Pradel. *Workshop on Relationships and Associations in Object-Oriented Languages (RAOOL) at OOPSLA'08*
- 2007 **A Good Role Model for Ontologies: Collaborations.**
Michael Pradel, Jakob Henriksson, Uwe Aßmann. *International Workshop on Semantic-Based Software Development at OOPSLA'07*

Awards and Distinctions

- May 2019 Member of the IFIP Working Group 2.4 (Software Implementation Technology)
- April 2019 Best Paper Award at ASPLOS'19 for *Wasabi: A Framework for Dynamically Analyzing WebAssembly*
- July 2016 Distinguished Poster Award at ECOOP'16 for *Language-Independent Fuzz Testing with Probabilistic, Generative Models*
- January 2014 Software Engineering Award of the Ernst-Denert-Foundation for the best dissertation (€5,000)
- November 2009 Enno Heidebroek award (best engineering graduates at TU Dresden)
- October 2009 Second winner in the Student Research Competition at OOPSLA'09 for paper *Dynamically Inferring, Refining, and Checking API Usage Protocols*
- July 2008 Best student paper award at the International Conference on Software and Data Technology for paper *Scala Roles - A Lightweight Approach towards Reusable Collaborations*

External Funding

- September 2019 ERC Starting Grant. *LearnBugs: Learning to Find Software Bugs*. Principal investigator. €1,500,000
- October 2017 Individual research project funded by the German Research Foundation (DFG). *Perf4JS: Automatically Fixing Performance Problems in Real-World JavaScript Applications*. Principal investigator.
- July 2017 Collaborative research project funded by the State of Hesse. *Software-Factory 4.0*. Principal investigator.
- May 2017 Collaborative research project funded by the German Federal Ministry of Education and Research (BMBF) and by the State of Hesse. *Center for Research in Security and Privacy (CRISP)*. Principal investigator.
- October 2015 Collaborative research project funded by the German Federal Ministry of Education and Research (BMBF) and by the State of Hesse. *Center for Research in Security and Privacy (CRISP)*. Principal investigator.
- October 2014 Collaborative research project funded by the German Federal Ministry of Education and Research (BMBF). *European Center for Security and Privacy by Design (EC-SPRIDE)*. Principal investigator.
- September 2014 Emmy Noether research group funded by DFG. *ConcSys: Reliable and Efficient Complex, Concurrent Software Systems*. Principal investigator. €1,300,000
- Spring 2008 Scholarship of the German Academic Exchange Service DAAD. €4,250
- 2004 – 2006 Scholarship of the French-German University UFA/DFH. €6,000

Note: In addition to the above, I have obtained various smaller grants (<€1,000) for myself and my students, e.g., travel grants from ACM SIGPLAN and ACM SIGSOFT.

Talks

Note: The following does not include regular paper presentations at conferences and workshops.

- 2020 Belgium-Netherlands Software Evolution Workshop (BENEVOL). Keynote
October meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
January meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
- 2019 Shonan seminar on *Fuzzing and Symbolic Execution*
University of California, Berkeley. Host: Koushik Sen
Workshop at PLDI'19 program committee meeting
- 2018 Dagstuhl seminar on *Genetic Improvement of Software*
Dagstuhl event on *Research Methods in Software Engineering*
Paderborn University. Host: Eric Bodden
Saarland University. Host: Holger Hermanns
ML4P Workshop at CAV. Invited talk
SOAP Workshop at ECOOP and ISSTA. Invited talk
Meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
University of Maryland. Host: Michael Hicks
Facebook Big Code Summit. Host: Satish Chandra
- 2017 Dagstuhl seminar on *Testing and Verification of Compilers*
Imperial College London. Hosts: Ben Livshits and Alastair Donaldson
CREST workshop on *Bimodal Program Analysis* at University College London
University of Edinburgh. Host: Paul Jackson
CISPA, Saarbrücken. Host: Michael Backes
Meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
University of Lugano (USI). Host: Mauro Pezze
Karlsruhe Institute of Technology. Host: Ralf Reussner
Stanford University. Host: Alex Aiken
Google, Mountain View. Host: Omer Tripp
Dagstuhl seminar on *Automated Program Repair*
University of Passau. Host: Christian Lengauer
SE 2017
- 2016 Meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
IMDEA Software Institute, Madrid. Host: Alessandra Gorla
Massachusetts Institute of Technology (MIT). Host: Martin Rinard
Harvard University. Host: Stephen Chong
Workshop at the ECOOP program committee meeting.
University of Stuttgart. Host: Daniel Weiskopf
TU Dresden. Host: Ivo F. Sbalzarini
- 2015 ETH Zurich. Host: Thomas R. Gross
Purdue University. Host: Mathias Payer
Aarhus University. Host: Anders Møller
Workshop on Programming Language Evolution. Invited speaker
Advisory Council of University Professors for the German Informatics Society (GIBU), Invited speaker
SE 2015. Two talks
Max Planck Institute for Software Systems, Host: Viktor Vafeiadis
- 2014 Workshop on Software Engineering for Parallel Systems. Invited speaker
Mozilla Research, San Francisco. Host: Michael Bebenita
University of California, Davis. Host: Zhendong Su
Google, Mountain View. Host: Ciera Jaspan
Samsung Research, San Jose. Host: Satish Chandra

- TU Darmstadt. Hosts: Mira Mezini and Eric Bodden
 SE 2014, Kiel. Award talk on the occasion of receiving the Software Engineering award of the Ernst-Denert-Foundation for the best dissertation
 Meeting of the IFIP Working Group 2.4 (Software Implementation Technology)
- 2013 University of Lugano (USI). Host: Matthias Hauswirth
 TU München. Host: Alexander Pretschner
 TU Kaiserslautern. Host: Arnd Poetzsch-Heffter
 TU Berlin. Host: Jean-Pierre Seifert
 TU Dresden. Host: Uwe Assmann
 Saarland University. Host: Andreas Zeller
 University of Bern. Host: Oscar Nierstrasz
 University of Zurich. Host: Harald Gall
 Karlsruhe Institute of Technology. Host: Walter Tichy
 TU Darmstadt. Hosts: Mira Mezini and Eric Bodden
- 2012 Coverity, San Francisco. Host: Murali Krishna Ramanathan
 University of California, Berkeley. Host: Koushik Sen
 University of Washington. Host: Michael Ernst
 Google, Zurich. Host: Andreas Leitner
- 2011 Google, Zurich. Hosts: Jürgen Allgayer and Andreas Leitner
 University of Waterloo. Hosts: Ondrej Lhotak and Patrick Lam
 Carnegie Mellon University. Host: Jonathan Aldrich
- 2010 Dagstuhl seminar on *Relationships, Objects, Roles, and Queries in Modern Programming Languages*
 Saarland University. Hosts: Sebastian Hack and Andreas Zeller
- 2009 Victoria University of Wellington. Host: David J. Pearce

Teaching Experience

Lecturer

- Winter 2020/21 **Program Analysis.**
 Lecture and project at University of Stuttgart. About 30 students.
- Machine Learning for Programming.**
 Seminar at University of Stuttgart. About 10 students.
- Summer 2020 **Analyzing Software using Deep Learning.**
 Lecture and project at University of Stuttgart. About 60 students.
- Programming Paradigms.**
 Lecture and exercise at University of Stuttgart. About 240 students.
- Winter 2019/20 **Program Analysis.**
 Lecture and project at University of Stuttgart. 20-30 students.
- Programming Paradigms.**
 Lecture and exercise at University of Stuttgart. About 200 students. Newly designed course.
- Practical Program Analysis.**
 Practical course at University of Stuttgart. About 10 students. Newly designed course.
- Machine Learning for Programming.**
 Seminar at University of Stuttgart. 10-15 students.
- Winter 2018/19 **Machine Learning for Programming.**
 Seminar at TU Darmstadt. About 15 students.
- Summer 2018 **Analyzing Software using Deep Learning.**
 Integrated course at TU Darmstadt. About 180 students.
- Winter 2017/18 **Program Testing and Analysis.**
 Integrated course at TU Darmstadt. About 100 students.

- Summer 2017 **Analyzing Software using Deep Learning.**
Integrated course at TU Darmstadt. About 300 students. Newly designed course. In addition to a final exam, students work on a larger coding project.
- Winter 2016/17 **Program Testing and Analysis.**
Integrated course at TU Darmstadt. About 80 students.
- Winter 2015/16 **Program Testing and Analysis.**
Integrated course at TU Darmstadt. About 60 students. Newly designed course (13 lectures of 90 minutes). In addition to a final exam, students work on a larger coding project and write a term paper.
- Winter 2014/15 **Program Analysis.**
Seminar at TU Darmstadt. 10-20 students. Newly designed course.
- Spring 2013 **Software Architecture and Engineering.**
Core undergraduate course at ETH Zurich. About 100 students. Co-taught with Martin Vechev. Re-designed and extended existing course. Full responsibility for 13 lectures of 90 minutes, exercise sessions, a larger coding project, and for managing a group of teaching assistants.
- Fall 2012 **Compiler Design.**
Replacement lecturer for one lecture of 90 minutes, at ETH Zurich.
- Teaching Assistant**
Teaching assistantships involve preparing and presenting exercises, preparing and grading exams, organizing office hours, and organizing larger coding projects.
- Fall 2012 **Compiler Design.**
- Fall 2011 **Compiler Design.**
- Fall 2009 **System Programming and Computer Architecture.**
- Fall 2008 **Computer Architecture.**
- Fall 2008 **System Programming.**
- Mentor**
- Spring 2011 **Software Engineering seminar.**
- Fall 2008 **Software Engineering seminar.**

Advising and Mentoring

- PhD students Matteo Paltenghi. Since December 2020
Aryaz Eghbali. Since October 2020
Luca Di Grazia. Since September 2019
Moiz Rauf. Since September 2019
Daniel Lehmann. Since December 2017
Andrew Habib. Since October 2015
Jibesh Patra. Since March 2015
Cristian-Alexandru Staicu. October 2014 – May 2020
Marija Selakovic. Since October 2014 – June 2019
- Master theses Sebastian Harner. *Automated Test Generation for Asynchronous, Higher-Order JavaScript Functions.* 2020
Fahad Ghouri. *Learning to Profile: Finding Optimization Opportunities through Machine Learning.* 2020
Yaza Wainakh. *A Benchmark for Evaluating and Improving Word Embeddings for Identifier Names.* 2019
Markus Zimmermann. *An Empirical Study of the npm Ecosystem.* 2018. See paper at USENIX Security'19
Sandro Tolksdorf. *Metamorphic Testing of Interactive JavaScript Debuggers.* 2018. See paper at ISSTA'19
Giacomo Iadarola. *Graph-based Classification for Detecting Instances of Bug Patterns.* 2018
Rabee Sohail Malik. *DeepTypes: a Probabilistic Approach to Inferring JavaScript Function Type Signatures.* 2018. See paper at ICSE'19

- Prabhjot Singh. *Deep Assist: Contextual Code Assistance using Deep Learning*. 2018
- Talal Ahmed. *VFix: Fixing Semantic Errors by Deep Learning*. 2018
- Philippe Skolka. *An Empirical Study of Obfuscation and Minification of Client-Side Web Code*. 2018. See paper at WWW'19
- Saeed Ehteshamifar. *Chameleon: A Benchmark for Analyzers of Malicious PDF Documents and Anti-Evasion Techniques*. 2017
- Daniel Lehmann. *Automatic Testing of Interactive JavaScript Debuggers*. 2017. See paper at FSE'18
- Sebastian Ruhleder. *Automatic Generation of Performance Benchmarks for JavaScript Libraries*. 2017
- Dileep R. K. Murthy. *Change-aware Dynamic Program Analysis*. 2016. See paper at ICSME'18
- Pooja Dixit. *Detecting Unexpected Interferences between Scripts in JavaScript Applications*. 2016. See paper at ICSE'18
- Markus Ermuth. *Effective UI-Level Test Generation for Web Applications through Inferred Macro Events*. 2015. See paper at ISSTA'16
- Ankit Choudhary. *Coverage-driven Generation of Concurrent Tests*. 2015. See paper at ICSE'17
- Michael Fäs. *Automatic and Precise Detection of Deadlocks in Libraries*. 2013
- Markus Huggler. *Performance Regression Testing for Thread-safe Classes*. 2013. See paper at ISSTA'14
- Jérémie Bresson. *Finding API Usage Bugs with Runtime Monitoring*. 2010
- Philipp Bichsel. *Inference of API Usage Documentation*. 2010. See paper at ICSM'10
- Sebastian Grössl. *Finding Implicit Programming Rules and their Violations in Java Programs*. 2009
- Bachelor theses
Lars Gröninger. *Building an Extensible Dataset of Code Reviews*. 2020
- Aaron Hilbig. *A Benchmark of WebAssembly Programs*. 2020
- Patrick Mell. *Detecting Parallelization Opportunities in JavaScript Programs*. 2016
- Thomas Glaser. *A Dynamic Analysis to Help Refactoring Complex Conditions for Improved Performance*. 2015. See paper at ISSTA'17
- Pascal Zimmermann. *Name-based Type Inference*. 2012
- Christine Zeller. *Software Anomaly Detection in a Real-world Setting*. Collaboration with Google, Zurich. 2012
- Severin Heiniger. *API Usage Anomaly Detection Based on Points-to Analysis*. 2011. See paper at ISSTA'12
- Claudio Corrodi. *Detecting Library Usage Anomalies*. 2011
- Undergraduate supervision
Satia Herfert. 2016–2017. See paper at ASE'17
- Abhijit Singh. 2015–2016.
- Hosam Nima. 2015.
- Parker Schuh. 2013–2014. See papers at OOPSLA'14 and ICSE'15

Reviewing and Service

- Organizer Chair of Tool Demonstrations at International Symposium on Software Testing and Analysis (ISSTA), 2021
- Chair of Artifact Evaluation at International Symposium on Software Testing and Analysis (ISSTA), 2019
- Chair of Artifact Evaluation at European Conference on Object-Oriented Programming (ECOOP), 2017
- Dagstuhl seminar on Automated Program Repair, 2017
- Workshop on Dynamic Analysis (WODA), 2016
- Workshop on Tools for JavaScript Analysis (JSTools) at ECOOP, 2016

Workshop on Tools for JavaScript Analysis (JSTools) at ECOOP, 2015

Editor IEEE Transactions on Software Engineering, 2020–2021, Associate editor
IEEE Software, 2020, Guest editor of special issue on “Automatic program repair”

Committee International Conference on Software Engineering (ICSE), 2022
member ACM SIGSOFT Research Highlights Committee (2020-2022)
Conference on Automated Software Engineering (ASE), 2021
Conference on Programming Language Design and Implementation (PLDI), 2021
International Conference on Software Engineering (ICSE), 2021
Symposium on the Foundations of Software Engineering (ESEC/FSE), 2021
International Symposium on Software Testing and Analysis (ISSTA), 2021
European Conference on Object-Oriented Programming (ECOOP), 2021
Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOP-
SLA), External review committee, 2020
Conference on Automated Software Engineering (ASE), 2020
IEEE Transactions on Software Engineering, Review board, 2019–2020
TheWebConf (WWW), Security track, 2020
Doctoral Symposium at SPLASH, 2019
Journal First Presentations at Conference on Automated Software Engineering (ASE), 2019
Conference on Programming Language Design and Implementation (PLDI), 2019
International Conference on Software Engineering (ICSE), Program board, 2019
Conference on Automated Software Engineering (ASE), 2018
European Conference on Object-Oriented Programming (ECOOP), 2018
International Symposium on Engineering Secure Software and Systems (ESSoS), 2018
Workshop on API Usage and Evolution (WAPI) at ICSE, 2018
Workshop on Programming Technology for the Future Web (ProWeb), 2018
Software Engineering (SE), 2018
IEEE Transactions on Software Engineering, Review board, 2017–2018
Conference on Programming Language Design and Implementation (PLDI), 2017
International Conference on Software Engineering (ICSE), 2017
International Symposium on Software Testing and Analysis (ISSTA), 2017
Workshops at SPLASH, Program Committee, 2017
ACM Student Research Competition at ESEC/FSE, 2017
ProWeb workshop on programming methodology for the future web, Program Committee,
2017
Conference on Programming Language Design and Implementation (PLDI), External review
committee, 2016
European Conference on Object-Oriented Programming (ECOOP), 2016
International Symposium on Software Testing and Analysis (ISSTA), 2016
International Symposium on the Foundations of Software Engineering (FSE), Demonstrations
Track, 2016
Student Contest on Software Engineering (SCORE) at ICSE, 2016
Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOP-
SLA), 2015
ACM SIGPLAN Student Research Competition at SPLASH, 2015
Conference on Automated Software Engineering (ASE), Tool Demonstration Track, 2015
Workshop on Software Engineering for Parallel Systems at OOPSLA, 2015
Software Engineering (SE), 2015
Workshop on Software Engineering for Parallel Systems at OOPSLA, 2014
ACM Student Research Competition at International Conference on Software Engineering
(ICSE), 2014

International Conference on Software Engineering (ICSE), poster track, 2014

Reviewer IEEE Transactions on Software Engineering, 2014–2020
Journal of Systems and Software, 2019
International Symposium on Software Testing and Analysis (ISSTA), 2019
Journal on Empirical Software Engineering, 2016
ACM Transactions on Software Engineering and Methodology (TOSEM), 2015
IEEE Transactions on Parallel and Distributed Systems, 2014
Science of Computer Programming, 2013, 2014
Information and Software Technology, 2013
IEEE Transactions on Information Forensics and Security, 2012
Journal of Computer Science and Technology (JCST), 2011

External Symposium on the Foundations of Software Engineering (FSE), 2016
reviewer Symposium on Principles of Programming Languages (POPL), 2016
European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), 2015
Conference on Computer Aided Verification (CAV), 2014
Conference on Programming Language Design and Implementation (PLDI), 2014
Principles and Practice of Parallel Programming (PPoPP), 2014
European Conference on Object-Oriented Programming (ECOOP), 2013
USENIX Workshop on Hot Topics in Parallelism (HotPar), 2012
Conference on Programming Language Design and Implementation (PLDI), 2011
Workshop on Relationships and Associations in Object-Oriented Languages (RAOOL) at ECOOP 2009

PhD thesis Anil Koyuncu (University of Luxembourg, advisor: Yves Le Traon), 2020
committee Profir-Petru Partachi (University College London, advisor: Earl Barr), 2020
member Rafael-Michael Karampatsis (University of Edinburgh, advisor: Charles Sutton), 2020
Luca Della Toffola (ETH Zurich, advisor: Thomas R. Gross), 2018
Francesco Bianchi (USI Lugano, advisor: Mauro Pezzè), 2018
Matthias Keil (University of Freiburg, advisor: Peter Thiemann), 2018
I also served on 10+ Ph.D. examination committees at TU Darmstadt and University of Stuttgart

References

Available on request

Last update: December 4, 2020