Maria Christakis

Date of birth	:	October 9, 1986
Place of birth	:	Heraklion, Crete, Greece
Sex	:	Female
Nationality	:	Greek
Website	:	https://mariachris.github.io
E-mail	:	maria@mpi-sws.org

Current Position

Oct 2017– Tenure-track faculty (W2)
Leader of the **Practical Formal Methods** Group
(On maternity leave from Oct 2020 to Sep 2021)
Max Planck Institute for Software Systems (MPI-SWS)
Kaiserslautern, Germany

Research Interests

My research goal is to develop theoretical foundations and practical tools for building more reliable and usable software and increasing developer productivity. I am primarily interested in **software engineering and formal methods**. I particularly like investigating topics in automatic test generation, program analysis, and software verification. My tools and techniques explore novel ways in writing, specifying, verifying, testing, and debugging programs in order to make them more robust while improving the developer experience.

Previous Positions

2016–2017 Lecturer (Assistant Professor),
School of Computing,
University of Kent,
Canterbury, England

2015–2016 Post-doctoral researcher,
Research in Software Engineering (RiSE) and Tools for Software Engineers (TSE),
Microsoft Research Redmond,
Washington, USA

Education

2011–2015 Ph.D., Chair of Programming Methodology,
Department of Computer Science,
ETH Zurich, Switzerland

GPA	:	6/6
Thesis	:	Narrowing the Gap between Verification and Systematic Testing
Advisor	:	Peter Müller

2009–2011	Research assistantship in Computer Science (Completion of Ph.D. courses)
	Department of Electrical and Computer Engineering,
	National Technical University of Athens, Greece

    GPA : 9.83/10
    Advisor : Konstantinos Sagonas

2003–2009	Diploma,
	Department of Electrical and Computer Engineering,
	National Technical University of Athens, Greece

    GPA : 8.58/10 (upper 9%)
    Major : Computer Science
    Thesis : Race Condition Detection in Concurrent Erlang Applications
              Using Static Analysis
    Advisor : Konstantinos Sagonas

Awards and Distinctions

2022   **Google Research Scholar Award** for conducting research on
"Metamorphic Specification and Testing of Machine-Learning Models" (60,000 USD)

2021   **ICSE Distinguished Reviewer Award**

2020   **Scientific Member of IFIP Working Group 2.4** Software Implementation Technology

2019   **ASE Distinguished Reviewer Award**

2017   **Facebook Faculty Research Award** for significant research contributions in the area
of Program Analysis (30,000 USD)

2017   **EAPLS Best PhD Dissertation 2015** for the most original and influential doctoral thesis
in the area of Programming Languages and Systems, which was published in 2015 at a
European academic institute

2016   **Distinguished Paper at ICSE'16** for
"Guiding Dynamic Symbolic Execution Toward Unverified Program Executions",
which is also listed as a **notable item in ACM's 21st Annual Best of Computing**

2016   **Nomination for the GI Dissertation Prize** by the Department of Computer Science
at ETH Zurich, Switzerland, which is awarded to an outstanding dissertation in Computer
Science in Austria, Germany, and Switzerland

2016   **ETH Medal** for an outstanding doctoral thesis and financial sum (2,000 CHF)

2016   **Empirikion Scholarship** for doctoral thesis (5,000 EUR)

2015   **Google Anita Borg Finalist**

2015   **Invitation from VMCAI'15** to submit an extended version of
"An Experimental Evaluation of Deliberate Unsoundness in a Static Program Analyzer"
to the Computer Languages, Systems & Structures journal

2014   **Invitation from SEFM'14** to submit an extended version of
"Synthesizing Parameterized Unit Tests to Detect Object Invariant Violations"
to the Formal Aspects of Computing journal

2013   **Google Anita Borg Finalist**

2011   **Travel grant** for attending Summer School Marktoberdorf, Germany

2010   **Empirikion Scholarship** for research (5,000 EUR)

2009   **Thomaideio Award** for publishing "Static Detection of Race Conditions in Erlang",
one of the best 200 research papers among all departments
of the National Technical University of Athens, Greece

2009   **Distinction for the best diploma thesis**
in the Department of Electrical and Computer Engineering
of the National Technical University of Athens, Greece

Research Grants

2018   **DFG Transregional Collaborative Research Center**
on "Foundations of Perspicuous Software Systems"
(no: 389792660–TRR 248, start: Jan 1, 2019, role: principal investigator,
amount: 11,309,800 EUR for the first phase from 2019 to 2022)
Saarland University, Dresden University of Technology, MPI-INF, MPI-SWS, Germany

2017   **International Academic Visitor** research grant (1,000 GBP)
University of Kent, England

2017   **Faculty of Sciences** research grant (500 GBP)
University of Kent, England

Conference Papers

1. Hasan Ferit Eniser, Timo P. Gros, Valentin Wüstholz, Jörg Hoffmann and <u>Maria Christakis</u>. **Metamorphic Relations via Relaxations: An Approach to Obtain Oracles for Action-Policy Testing**. In Proceedings of the 31st International Symposium on Software Testing and Analysis (**ISSTA'22**), 2022. ACM.
   Acceptance rate: 24.4%

2. Marcel Steinmetz, Daniel Fiser, Hasan Ferit Eniser, Patrick Ferber, Timo P. Gros, Philippe Heim, Daniel Höller, Xandra Schuler, Valentin Wüstholz, <u>Maria Christakis</u> and Jörg Hoffmann. **Debugging a Policy: Automatic Action-Policy Testing in AI Planning**. In Proceedings of the 32nd International Conference on Automated Planning and Scheduling (**ICAPS'22**), 2022. AAAI Press.
   Acceptance rate: 30.7%

3. Scott Wesley, <u>Maria Christakis</u>, Jorge A. Navas, Richard Trefler, Valentin Wüstholz and Arie Gurfinkel. **Verifying Solidity Smart Contracts via Communication Abstraction in SmartACE**. In Proceedings of the 23rd International Conference on Verification, Model Checking, and Abstract Interpretation (**VMCAI'22**), 2022. Springer.
   Acceptance rate: 36.5%

4. Scott Wesley, <u>Maria Christakis</u>, Jorge A. Navas, Richard Trefler, Valentin Wüstholz and Arie Gurfinkel. **Compositional Verification of Smart Contracts Through Communication Abstraction**. In Proceedings of the 28th Static Analysis Symposium (**SAS'21**), 2021. Springer.
   Acceptance rate: 55.0%

5. Muhammad Numair Mansur, <u>Maria Christakis</u> and Valentin Wüstholz. **Metamorphic Testing of Datalog Engines**. In Proceedings of the 29th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'21**), 2021. ACM.
   Acceptance rate: 24.5%

6. <u>Maria Christakis</u>, Hasan Ferit Eniser, Holger Hermanns, Jörg Hoffmann, Yugesh Kothari, Jianlin Li, Jorge A. Navas and Valentin Wüstholz. **Automated Safety Verification of Programs Invoking Neural Networks**. In Proceedings of the 33rd International Conference on Computer-Aided Verification (**CAV'21**), 2021. Springer.
   Acceptance rate: 27.2%

7. Muhammad Numair Mansur, Benjamin Mariano, <u>Maria Christakis</u>, Jorge A. Navas and Valentin Wüstholz. **Automatically Tailoring Abstract Interpretation to Custom Usage Scenarios**. In Proceedings of the 33rd International Conference on Computer-Aided Verification (**CAV'21**), 2021. Springer.
   Acceptance rate: 27.2%

8. Debasmita Lohar, Clothilde Jeangoudoux, Joshua Sobel, Eva Darulova and <u>Maria Christakis</u>. **A Two-Phase Approach for Conditional Floating-Point Verification**. In Proceedings of the 27th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (**TACAS'21**), 2021. Springer.
   Acceptance rate: 33.3%

9. Umair Z. Ahmed, <u>Maria Christakis</u>, Aleksandr Efremov, Nigel Fernandez, Ahana Ghosh, Abhik Roychoudhury and Adish Singla. **Synthesizing Tasks for Block-based Programming**. In Proceedings of the 34th Conference on Neural Information Processing Systems (**NeurIPS'20**), 2020.
   Acceptance rate: 20.1%

10. Caterina Urban, <u>Maria Christakis</u>, Valentin Wüstholz and Fuyuan Zhang. **Perfectly Parallel Fairness Certification of Neural Networks**. In Proceedings of the ACM on Programming Languages (**OOPSLA'20**), 2020. ACM.
    Acceptance rate: 36.1%

11. Valentin Wüstholz and <u>Maria Christakis</u>. **Harvey: A Greybox Fuzzer for Smart Contracts**. In Proceedings of the 28th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'20**), 2020. ACM.
    Acceptance rate: 35.8%

12. Muhammad Numair Mansur, <u>Maria Christakis</u>, Valentin Wüstholz and Fuyuan Zhang. **Detecting Critical Bugs in SMT Solvers Using Blackbox Mutational Fuzzing**. In Proceedings of the 28th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'20**), 2020. ACM. Acceptance rate: 28.1%
Received the **best presentation award**.

13. Fuyuan Zhang, Sankalan Pal Chowdhury and <u>Maria Christakis</u>. **DeepSearch: A Simple and Effective Blackbox Attack for Deep Neural Networks**. In Proceedings of the 28th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'20**), 2020. ACM. Acceptance rate: 28.1%

14. Valentin Wüstholz and <u>Maria Christakis</u>. **Targeted Greybox Fuzzing with Static Lookahead Analysis**. In Proceedings of the 42nd International Conference on Software Engineering (**ICSE'20**), 2020. ACM. Acceptance rate: 20.9%

15. Christian Klinger, <u>Maria Christakis</u> and Valentin Wüstholz. **Differentially Testing Soundness and Precision of Program Analyzers**. In Proceedings of the 28th International Symposium on Software Testing and Analysis (**ISSTA'19**), 2019. ACM. Acceptance rate: 22.5%

16. <u>Maria Christakis</u>, Matthias Heizmann, Muhammad Numair Mansur, Christian Schilling and Valentin Wüstholz. **Semantic Fault Localization and Suspiciousness Ranking**. In Proceedings of the 25th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (**TACAS'19**), 2019. Springer. Acceptance rate: 30.5%

17. Alexandra Bugariu, Valentin Wüstholz, <u>Maria Christakis</u> and Peter Müller. **Automatically Testing Implementations of Numerical Abstract Domains**. In Proceedings of the 33rd International Conference on Automated Software Engineering (**ASE'18**), 2018. ACM. Acceptance rate: 19.9%

18. Austin Henley, Kıvanç Muşlu, <u>Maria Christakis</u>, Scott Fleming and Christian Bird. **CFar: A Tool to Increase Communication, Productivity, and Review Quality in Collaborative Code Reviews**. In Proceedings of the 36th International Conference on Human Factors in Computing Systems (**CHI'18**), 2018. ACM. Acceptance rate: 25.7%

19. Kostas Ferles, Valentin Wüstholz, <u>Maria Christakis</u> and Isil Dillig. **Failure-Directed Program Trimming**. In Proceedings of the Eleventh Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'17**), 2017. ACM. Acceptance rate: 24.4%

20. <u>Maria Christakis</u>, Patrick Emmisberger, Patrice Godefroid and Peter Müller. **A General Framework for Dynamic Stub Injection**. In Proceedings of the 39th International Conference on Software Engineering (**ICSE'17**), 2017. ACM. Acceptance rate: 16.4%

21. <u>Maria Christakis</u> and Christian Bird. **What Developers Want and Need from Program Analysis: An Empirical Study**. In Proceedings of the 31st International Conference on Automated Software Engineering (**ASE'16**), 2016. ACM.
Acceptance rate: 19.1%

22. <u>Maria Christakis</u> and Valentin Wüstholz. **Bounded Abstract Interpretation**. In Proceedings of the 23rd Static Analysis Symposium (**SAS'16**), 2016. Springer.
Acceptance rate: 38.2%

23. <u>Maria Christakis</u>, K. Rustan M. Leino, Peter Müller and Valentin Wüstholz. **Integrated Environment for Diagnosing Verification Errors**. In Proceedings of the 22nd International Conference on Tools and Algorithms for the Construction and Analysis of Systems (**TACAS'16**), 2016. Springer.
Acceptance rate: 28.7%

24. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **Guiding Dynamic Symbolic Execution Toward Unverified Program Executions**. In Proceedings of the 38th International Conference on Software Engineering (**ICSE'16**), 2016. ACM.
Acceptance rate: 19.1%
Received a **distinguished paper award**.
Listed as a **notable item in ACM's 21st Annual Best of Computing**.

25. <u>Maria Christakis</u> and Patrice Godefroid. **IC-Cut: A Compositional Search Strategy for Dynamic Test Generation**. In Proceedings of the 22nd International SPIN Symposium on Model Checking of Software (**SPIN'15**), 2015. Springer.
Acceptance rate: 69.2%

26. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **An Experimental Evaluation of Deliberate Unsoundness in a Static Program Analyzer**. In Proceedings of the Sixteenth International Conference on Verification, Model Checking, and Abstract Interpretation (**VMCAI'15**), 2015. Springer.
Acceptance rate: 45.3%
Selected for submission to the Computer Languages, Systems & Structures journal.

27. <u>Maria Christakis</u> and Patrice Godefroid. **Proving Memory Safety of the ANI Windows Image Parser Using Compositional Exhaustive Testing**. In Proceedings of the Sixteenth International Conference on Verification, Model Checking, and Abstract Interpretation (**VMCAI'15**), 2015. Springer.
Acceptance rate: 45.3%

28. <u>Maria Christakis</u>, Patrick Emmisberger and Peter Müller. **Dynamic Test Generation with Static Fields and Initializers**. In Proceedings of the Fourteenth International Conference on Runtime Verification (**RV'14**), 2014. Springer.
Acceptance rate: 29.8%

29. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **Synthesizing Parameterized Unit Tests to Detect Object Invariant Violations**. In Proceedings of the Twelfth International Conference on Software Engineering and Formal Methods (**SEFM'14**), 2014. Springer.
Acceptance rate: 27.4%
Selected for submission to the Formal Aspects of Computing journal.

30. <u>Maria Christakis</u>, K. Rustan M. Leino and Wolfram Schulte. **Formalizing and Verifying a Modern Build Language**. In Proceedings of the Nineteenth International Symposium on Formal Methods (**FM'14**), 2014. Springer.
Acceptance rate: 43.8%

31. <u>Maria Christakis</u>, Alkis Gotovos and Konstantinos Sagonas. **Systematic Testing for Detecting Concurrency Errors in Erlang Programs**. In Proceedings of the Sixth International Conference on Software Testing, Verification and Validation (**ICST'13**), 2013. IEEE.
Acceptance rate: 25.0%

32. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **Collaborative Verification and Testing with Explicit Assumptions**. In Proceedings of the Eighteenth International Symposium on Formal Methods (**FM'12**), 2012. Springer.
Acceptance rate: 26.5%

33. <u>Maria Christakis</u> and Konstantinos Sagonas. **Detection of Asynchronous Message Passing Errors Using Static Analysis**. In Proceedings of the Thirteenth International Symposium on Practical Aspects of Declarative Languages (**PADL'11**), 2011. Springer.
Acceptance rate: 45.0%

34. <u>Maria Christakis</u> and Konstantinos Sagonas. **Static Detection of Race Conditions in Erlang**. In Proceedings of the Twelfth International Symposium on Practical Aspects of Declarative Languages (**PADL'10**), 2010. Springer.
Acceptance rate: 37.9%

Workshop Papers

1. Hasan Ferit Eniser, Timo P. Gros, Valentin Wüstholz, Jörg Hoffmann and <u>Maria Christakis</u>. **Metamorphic Relations via Relaxations: An Approach to Obtain Oracles for Action-Policy Testing**. Presented at the First International Workshop on Reliable Data-Driven Planning and Scheduling (**RDDPS'22**), 2022.

2. Christel Baier, <u>Maria Christakis</u>, Timo P. Gros, David Groß, Stefan Gumhold, Holger Hermanns, Jörg Hoffmann and Michaela Klauck. **Lab Conditions for Research on Explainable Automated Decisions**. In Proceedings of the First International Workshop on the Scientific Foundations of Trustworthy AI - Integrating Learning, Optimisation and Reasoning (**TAILOR'20**), 2020. Springer.

3. Alkis Gotovos, <u>Maria Christakis</u> and Konstantinos Sagonas. **Test-Driven Development of Concurrent Programs Using Concuerror**. In Proceedings of the Tenth Erlang Workshop (**ERLANG'11**), 2011. ACM.

Invited Papers

1. Maria Christakis. **On Narrowing the Gap between Verification and Systematic Testing**. In it - Information Technology, 2017. de Gruyter.

2. Maria Christakis. **Brückenschlag zwischen Verifikation und Systematischem Testen**. In Ausgezeichnete Informatikdissertationen 2015 (GIDISS'15), 2015. GI.

Technical Reports

1. <u>Maria Christakis</u>, Hasan Ferit Eniser, Jörg Hoffmann, Adish Singla and Valentin Wüstholz. **Specifying and Testing k-Safety Properties for Machine-Learning Models**. CoRR abs/2206.06054, 2022.

2. Scott Wesley, <u>Maria Christakis</u>, Jorge A. Navas, Richard Trefler, Valentin Wüstholz and Arie Gurfinkel. **Compositional Verification of Smart Contracts Through Communication Abstraction (Extended)**. CoRR abs/2107.08583, 2021.

3. Muhammad Numair Mansur, Benjamin Mariano, <u>Maria Christakis</u>, Jorge A. Navas and Valentin Wüstholz. **Automatically Tailoring Static Analysis to Custom Usage Scenarios**. CoRR abs/2009.13860, 2020.

4. Umair Z. Ahmed, <u>Maria Christakis</u>, Aleksandr Efremov, Nigel Fernandez, Ahana Ghosh, Abhik Roychoudhury and Adish Singla. **Synthesizing Tasks for Block-Based Programming**. CoRR abs/2006.16913, 2020.

5. Muhammad Numair Mansur, <u>Maria Christakis</u>, Valentin Wüstholz and Fuyuan Zhang. **Detecting Critical Bugs in SMT Solvers Using Blackbox Mutational Fuzzing**. CoRR abs/2004.05934, 2020.

6. Hasan Ferit Eniser, <u>Maria Christakis</u> and Valentin Wüstholz. **RAID: Randomized Adversarial-Input Detection for Neural Networks**. CoRR abs/2002.02776, 2020.

7. Caterina Urban, <u>Maria Christakis</u>, Valentin Wüstholz and Fuyuan Zhang. **Perfectly Parallel Fairness Certification of Neural Networks**. CoRR abs/1912.02499, 2019.

8. Fuyuan Zhang, Sankalan Pal Chowdhury and <u>Maria Christakis</u>. **DeepSearch: Simple and Effective Blackbox Fuzzing of Deep Neural Networks**. CoRR abs/1910.06296, 2019.

9. Valentin Wüstholz and <u>Maria Christakis</u>. **Targeted Greybox Fuzzing with Static Lookahead Analysis**. CoRR abs/1905.07147, 2019.

10. Valentin Wüstholz and <u>Maria Christakis</u>. **Harvey: A Greybox Fuzzer for Smart Contracts**. CoRR abs/1905.06944, 2019.

11. Christian Klinger, <u>Maria Christakis</u> and Valentin Wüstholz. **Differentially Testing Soundness and Precision of Program Analyzers**. CoRR abs/1812.05033, 2018.

12. Valentin Wüstholz and <u>Maria Christakis</u>. **Learning Inputs in Greybox Fuzzing**. CoRR abs/1807.07875, 2018.

13. Florentin Guth, Valentin Wüstholz, <u>Maria Christakis</u> and Peter Müller. **Specification Mining for Smart Contracts with Automatic Abstraction Tuning**. CoRR abs/1807.07822, 2018.

14. Kostas Ferles, Valentin Wüstholz, <u>Maria Christakis</u> and Isil Dillig. **Failure-Directed Program Trimming (Extended Version)**. CoRR abs/1706.04468, 2017.

15. <u>Maria Christakis</u>, Patrick Emmisberger, Patrice Godefroid and Peter Müller. **A General Framework for Dynamic Stub Injection**. MSR–TR–2016–35, 2016. Microsoft Research.

16. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **Guiding Dynamic Symbolic Execution Toward Unverified Program Executions**. 2015. ETH Zurich.

17. <u>Maria Christakis</u> and Patrice Godefroid. **IC-Cut: A Compositional Search Strategy for Dynamic Test Generation**. MSR–TR–2015–10, 2015. Microsoft Research.

18. <u>Maria Christakis</u>, Peter Müller and Valentin Wüstholz. **An Experimental Evaluation of Deliberate Unsoundness in a Static Program Analyzer**. 2014. ETH Zurich.

19. <u>Maria Christakis</u> and Patrice Godefroid. **Proving Memory Safety of the ANI Windows Image Parser Using Compositional Exhaustive Testing**. MSR–TR–2013–120, 2013. Microsoft Research.

20. <u>Maria Christakis</u> and Konstantinos Sagonas. **Static Detection of Deadlocks in Erlang**. In Draft Proceedings of the Twelfth International Symposium on Trends in Functional Programming (TFP'11), 2011. Department of Computer Systems and Computing, Universidad Complutense de Madrid.

Theses

1. Maria Christakis. **Narrowing the Gap between Verification and Systematic Testing**. Ph.D. thesis advised by Peter Müller. Department of Computer Science, ETH Zurich, Switzerland, June 2015.

2. Maria Christakis. **Race Condition Detection in Concurrent Erlang Applications Using Static Analysis**. Diploma thesis advised by Konstantinos Sagonas. Department of Electrical and Computer Engineering, National Technical University of Athens, Greece, September 2009.

Research Internships

Summer 2014 Microsoft Research Redmond,
Washington, USA
Mentor : Patrice Godefroid
Summer 2013 Microsoft Research Redmond,
Washington, USA
Mentors : K. Rustan M. Leino and Wolfram Schulte
Spring 2013 Microsoft Research Redmond,
Washington, USA
Mentor : Patrice Godefroid

Summer Schools

Jun 2012 SAT/SMT Summer School, Trento, Italy

Aug 2011 "Tools for Analysis and Verification of Software Safety and Security"
Summer School Marktoberdorf, Bayrischzell, Germany

Service

Organizer	:	Dagstuhl Seminar on "Software Bug Detection: Challenges and Synergies" (2023), Dagstuhl Seminar on "Rigorous Methods for Smart Contracts" (2021), Dagstuhl Seminar on "Ensuring the Reliability and Robustness of Database Management Systems" (2021), DATE'21 session on "Perspicuous Computing"
(Co-)Chair	:	ECOOP/ISSTA'21 Workshops, VSTTE'20, ECOOP'19 Artifact Evaluation, PLDI'19 Student Research Competition, ECOOP'18 Artifact Evaluation, PLDI'18 Student Research Competition
Steering Committee member	:	DeFi Security Summit'22
Program Committee member	:	ESEC/FSE'22, ICSE'22, ICSE'21, CAV'20, ISSTA'20, FASE'20, FMBC'19, ASE'19, ISSTA'19, ICSE'19, TACAS'19, ACM Student Research Competition'18, iFM'18, OOPSLA'18, VMCAI'18, SAS'17, ECOOP'17, PrePost'16, ESEC/FSE'15 Artifact Evaluation
External Review Committee member	:	PLDI'18, PLDI'17
Journal reviewer	:	IEEE TSE (on the Review Board since 2020), ACM TOSEM (on the Board of Distinguished Reviewers since 2019), IEEE Software (2016), Systems and Software (2016), JLAMP (2014), TSE (2013, 2019), STTT (2013)
Panel member	:	"A View from the Trenches (from Junior and Mid-Career Faculty Members)"
	:	at the New Faculty Symposium of ICSE'22
External reviewer	:	ISSTA'18, TAP'16, TACAS'16, VMCAI'16, FM'15, WFLP'14, FLOPS'14, OOPSLA'13, PADL'11, DAMP'10
Thesis reviewer	:	Master's thesis by A. Leid (Stellenbosch University, South Africa, 2020)
Student volunteer	:	Software Correctness and Reliability Workshop at ETH Zurich (2014), ICSE'12

Teaching Experience

Fall 2020 — Lecturer in "Program Analysis",
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Spring 2020 — Lecturer in "Machine Learning and Formal Methods",
Department of Computer Science,
Saarland University, Germany

Fall 2019 — Lecturer in "Research Topics in Software Reliability",
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Fall 2019 — Lecturer in "Program Analysis",
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Fall 2018 — Lecturer in "Program Analysis",
Department of Computer Science,
Technical University of Kaiserslautern and Saarland University, Germany

Summer 2018   Lecturer in "Static Program Analysis Meets Test Case Generation",
Cornell, Maryland, Max Planck Pre-Doctoral Research School (CMMRS) 2018,
MPI-SWS, Germany

Spring 2017   Lecturer in "Programming for University Study" (International Foundation Programme),
School of Computing,
University of Kent, England

2011–2014   Teaching assistant in "Computer Science for Mathematicians and Physicists",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturers :   Bernd Gärtner, Juraj Hromkovic

Fall 2014   Teaching assistant in "Software Engineering",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturer :   Peter Müller

Spring 2014   Teaching assistant in "Software Architecture and Engineering",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturers :   Peter Müller, Martin Vechev

2012–2013   Head teaching assistant in the industry course "Quality Assurance in .NET with Code
Contracts",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturer :   Peter Müller

Spring 2012   Head teaching assistant in "Software Architecture and Engineering",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturer :   Peter Müller

Spring 2012   Teaching assistant in "Research Topics in Software Engineering",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturers :   Peter Müller, Martin Vechev

Fall 2011   Teaching assistant in "Software and Security Testing",
Department of Computer Science,
ETH Zurich, Switzerland
  Lecturers :   David Basin, Peter Müller

2009–2011   Teaching assistant in "Programming Languages I",
Department of Electrical and Computer Engineering,
National Technical University of Athens, Greece
  Lecturers :   Nikolaos Papaspyrou, Konstantinos Sagonas

2009–2011	Teaching assistant in "Computer Programming", Department of Electrical and Computer Engineering, National Technical University of Athens, Greece

Lecturers : Stathis Zachos, Nikolaos Papaspyrou, Dimitris Fotakis

Advisees

2019–	Hasan Ferit Eniser PhD MPI-SWS, Germany

2018–	Numair Mansur PhD MPI-SWS, Germany

2020–	Jiradet Ounjai Internship MPI-SWS, Germany

2022	Sofia Barkatsa Internship MPI-SWS, Germany

2021	Andreea Buterchi **Metamorphic Testing of Machine-Learning Models** Internship MPI-SWS, Germany

2020–2021	Yugesh Kothari **Automated Safety Verification of Programs Invoking Neural Networks** Internship MPI-SWS, Germany

2019–2021	Fuyuan Zhang Postdoc MPI-SWS, Germany

2019–2020	Sankalan Pal Chowdhury **Testing the Robustness of Machine-Learning Software** Internship MPI-SWS, Germany

2019–2021	Xuan Xie **Integrating Dynamic Symbolic Execution into Greybox Fuzzing** PhD preparatory phase MPI-SWS, Germany

2020	Jiradet Ounjai **Potential Coverage Analysis for Coverage-Guided Greybox Fuzz Testing** Master's thesis MPI-SWS, Germany

2020   Parv Mor
        Combining Bounded Model Checking with Abstract Interpretation
        Internship
        MPI-SWS, Germany

2019   Ben Mariano
        Automatically Tailoring Abstract Interpretation to Custom Usage Scenarios
        Internship
        MPI-SWS, Germany

2019   Adam Geller
        Integrating Dynamic Symbolic Execution into Greybox Fuzzing
        Internship
        MPI-SWS, Germany

2019   Ahmed Anwar
        Testing SMT Solvers
        Internship
        MPI-SWS, Germany

2018   Praveen Kulkarni
        Automatically Balancing Precision and Performance in Abstract Interpretation
        Internship
        MPI-SWS, Germany

2018   Christos Vrachas
        Combining Bounded Model Checking with Abstract Interpretation
        Internship
        MPI-SWS, Germany

2018   Abel Nieto
        Targeted Greybox Fuzzing with Static Lookahead Analysis
        Internship
        MPI-SWS, Germany

2018   Tobias Zimmermann
        **Applying Backwards Abstract Interpretation to
        Binary Classification Neural Networks**
        Bachelor's thesis
        MPI-SWS, Germany

2018   Christian Klinger
        **Automatically Finding Differences in Soundness and Precision
        of Program Analyzers**
        Master's thesis
        MPI-SWS, Germany

2017   Malte Schledjewski
Diffing Program Analyzers
Research immersion lab
MPI-SWS, Germany

2016   Austin Henley
Augmenting Code Reviews with Static Analysis Warnings to Improve Code and Enhance Collaboration
Internship
Microsoft Research Redmond,
Washington, USA

2016   Kostas Ferles
Failure-Directed Program Trimming
Internship
Microsoft Research Redmond,
Washington, USA

2016   Patrick Emmisberger
Testing Program Robustness Against Deviant Behavior
Master's thesis (during an internship at Microsoft Research Redmond)
Department of Computer Science,
ETH Zurich, Switzerland
Received the **ETH Medal** for an outstanding Master's thesis

2015   Patrick Emmisberger
Integrating Dynamic Test Generation with Sound Verification
Research in Computer Science
Department of Computer Science,
ETH Zurich, Switzerland

2014   David Rohr
Fixing Violated Object Invariants and Testing Inferred Object Invariants
Research in Computer Science
Department of Computer Science,
ETH Zurich, Switzerland

2013   Patrick Spettel
Delfy: Dynamic Test Generation for Dafny
Master's thesis
Department of Computer Science,
ETH Zurich, Switzerland

2013   Patrick Emmisberger
Dynamic Test Generation with Static Fields and Initializers
Bachelor's thesis
Department of Computer Science,
ETH Zurich, Switzerland

2013   Timon Gehr
Synthesizing Method Sequences to Detect Object Invariant Violations
Bachelor's thesis
Department of Computer Science,
ETH Zurich, Switzerland

2011   Alkis Gotovos
Dynamic Systematic Testing of Concurrent Erlang Programs
Diploma thesis
Department of Electrical and Computer Engineering,
National Technical University of Athens, Greece

Invited Talks

1. 65th IFIP WG2.4 (Online) Meeting on Software Implementation Technology, November 2021.

2. Technical University of Vienna, Austria, September 2021.

3. IFIP WG2.2 Meeting on Formal Description of Programming Concepts, Münster, Germany, September 2021.

4. Technical University of Berlin, Germany, January 2021.

5. Cornell, Maryland, Max Planck Pre-Doctoral Research School (CMMRS) 2020, Saarbrücken, Germany, August 2020.

6. 62nd IFIP WG2.4 Meeting on Software Implementation Technology, Port Elizabeth, South Africa, January 2020.

7. "Fuzzing and Symbolic Execution: Reflections, Challenges, and Opportunities", NII Shonan Meeting, Kanagawa, Japan, September 2019.

8. "Bringing CP, SAT and SMT Together: Next Challenges in Constraint Solving", Dagstuhl Seminar, Saarland, Germany, February 2019.

9. Imperial College London, UK, November 2018.

10. 60th IFIP WG2.4 Meeting on Software Implementation Technology, Dijon, France, July 2018.

11. Joint Lecture Series of MPI-INF, MPI-SWS, MMCI, and the Computer Science Department of Saarland University, Saarbrücken, Germany, July 2018.

12. 59th IFIP WG2.4 Meeting on Software Implementation Technology, Essex, Vermont, USA, October 2017.

13. New Faculty Symposium at ICSE'17, Buenos Aires, Argentina, May 2017.

14. Royal Holloway University of London, UK, March 2017.

15. Max Planck Institute for Software Systems, Germany, February 2017.

16. Aarhus University, Denmark, January 2017.

17. Queen Mary University of London, UK, January 2017.

18. University of Washington, Washington, USA, August 2016.

19. "Kolloquium zum GI Dissertationspreis 2015", Dagstuhl Seminar, Saarland, Germany, May 2016.

20. University of Kent, England, March 2016.

21. École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, February 2015.

22. "Symbolic Execution and Constraint Solving", Dagstuhl Seminar, Saarland, Germany, October 2014.

23. Carnegie Mellon University, Pennsylvania, USA, September 2014.

24. University of Washington, Washington, USA, May 2013.

25. Programming Language Working Group, Microsoft Research Redmond, Washington, USA, April 2013.

26. Program Analysis Working Group, Microsoft Research Redmond, Washington, USA, March 2013.

27. Imperial College London, UK, February 2013.

28. Commissariat à l'Énergie Atomique (CEA), Paris, France, February 2013.

29. "Symbolic Methods in Testing", Dagstuhl Seminar, Saarland, Germany, January 2013.

30. Tenth Programming Language Seminar, National Technical University of Athens, Greece, December 2012.

31. Eighth Programming Language Seminar, National Technical University of Athens, Greece, December 2010.

Software

- π-**fuzz**: A metamorphic-testing framework for action policies

- **SmartACE**: A compositional verifier for smart contracts

- **queryFuzz**: A metamorphic-testing framework for Datalog engines

- **Neuro-aware program analyzer**: A static analyzer for verifying system properties of programs invoking neural networks

- **tAIlor**: A framework for automatically tailoring an abstract interpreter to the code under analysis and any given resource constraints

- **Blossom**: A two-phase framework combining dynamic and static analyses for conditional floating-point verification

- **Task synthesizer for block-based programming**: A synthesis framework for generating new visual programming tasks along with their solution codes that are conceptually similar but visually dissimilar to an input task

- **LIBRA**: A static-analysis framework for certifying fairness of deep neural networks

- **STORM**: A blackbox mutational fuzzer for SMT solvers

- **DeepSearch**: A blackbox attack for deep neural networks

- **bran**: A static-analysis framework for EVM bytecode

- α-**Diff**: A framework for differentially testing soundness and precision of program analyzers

Languages

Greek	:	Mother tongue
English	:	TOEFL iBT (Score: 117/120), 2011
		Certificate of Proficiency in English (University of Cambridge), 2003
Italian	:	Diploma di Lingua Italiana (CELI 5), 2011
Spanish	:	Diploma Superior de Español, 2003
French	:	Diplôme d'Études en Langue Française (DELF), 2001
German	:	Elementary proficiency