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.christakis@tuwien.ac.at

Current Position

Sep 2022– Full Professor
Head of the **Rigorous Software Engineering** Group
Head of the **Software Engineering** Research Unit
Information Systems Engineering Institute,
TU Wien Faculty of Informatics,
Vienna, Austria

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

2017–2022 Tenure-track faculty (W2)
Head 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

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

2024 **Member of the Young Academy of the Austrian Academy of Sciences**

2024 **Amazon Research Award Fall 2023** for conducting research on
"Testing Dafny for Unsoundness and Brittleness Bugs"
(50,000 USD and 20,000 USD in AWS credits)

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

2023   **ERC Starting Grant 2022 on "Testing Program Analyzers Ad Absurdum"**
(start: Jul 1, 2023, role: principal investigator, amount: ca. 1.5M EUR)
TU Wien, Austria

2022   **WWTF Information and Communication Technology
on "ForSmart: Effective Formal Methods for Smart-Contract Certification"**
(start: Sep 1, 2023, role: leading principal investigator, amount: ca. 800K EUR)
TU Wien, Austria

2018   **DFG Transregional Collaborative Research Center
on "Foundations of Perspicuous Software Systems"**
(start: Jan 1, 2019, role: principal investigator, amount: ca. 24M EUR from 2019 to 2026)
Saarland University, Dresden University of Technology, MPI-INF, MPI-SWS, Germany

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

Conference Papers

1. Anagha Athavale, Ezio Bartocci, <u>Maria Christakis</u>, Matteo Maffei, Dejan Nickovic and Georg Weissenbacher. **Verifying Global Two-Safety Properties in Neural Networks with Confidence**. In Proceedings of the 36th International Conference on Computer-Aided Verification (**CAV'24**), 2024. Springer.
Acceptance rate: 26.2%

2. Jan Eisenhut, Xandra Schuler, Daniel Fiser, Daniel Höller, <u>Maria Christakis</u> and Jörg Hoffmann. **New Fuzzing Biases for Action Policy Testing**. In Proceedings of the 34th International Conference on Automated Planning and Scheduling (**ICAPS'24**), 2024. AAAI Press.
Acceptance rate: 21.6%

3. Hasan Ferit Eniser, Valentin Wüstholz and <u>Maria Christakis</u>. **Automatically Testing Functional Properties of Code Translation Models**. In Proceedings of the 38th AAAI Conference on Artificial Intelligence (**AAAI'24**), 2024. AAAI Press.
Acceptance rate: 24.1%

4. Jiradet Ounjai, Valentin Wüstholz and <u>Maria Christakis</u>. **Green Fuzzer Benchmarking**. In Proceedings of the 32nd International Symposium on Software Testing and Analysis (**ISSTA'23**), 2023. ACM.
Acceptance rate: 28.8%

5. <u>Maria Christakis</u>, Hasan Ferit Eniser, Jörg Hoffmann, Adish Singla and Valentin Wüstholz. **Specifying and Testing k-Safety Properties for Machine-Learning Models**. In Proceedings of the 32nd International Joint Conference on Artificial Intelligence (**IJCAI'23**), 2023. ijcai.org.
Acceptance rate: 15.0%

6. Jan Eisenhut, Álvaro Torralba, <u>Maria Christakis</u> and Jörg Hoffmann. **Automatic Metamorphic Test Oracles for Action-Policy Testing**. In Proceedings of the 33rd International Conference on Automated Planning and Scheduling (**ICAPS'23**), 2023. AAAI Press.
Acceptance rate: 30.6%

7. Muhammad Numair Mansur, Valentin Wüstholz and <u>Maria Christakis</u>. **Dependency-Aware Metamorphic Testing of Datalog Engines**. In Proceedings of the 32nd International Symposium on Software Testing and Analysis (**ISSTA'23**), 2023. ACM.
Acceptance rate: 28.8%

8. <u>Maria Christakis</u>, Thomas Cottenier, Antonio Filieri, Linghui Luo, Muhammad Numair Mansur, Lee Pike, Nicolás Rosner, Martin Schäf, Aritra Sengupta and Willem Visser. **Input Splitting for Cloud-Based Static Application Security Testing Platforms**. In Proceedings of the 30th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC/FSE'22**), 2022. ACM.
Acceptance rate: 37.6%

9. 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%

10. 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%

11. 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%

12. 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%

13. 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%

14. <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%

15. 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%

16. 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%

17. 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%

18. 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%

19. 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%

20. 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**.

21. 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%

22. 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%

23. 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%

24. <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%

25. 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%

26. 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%

27. 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%

28. <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%

29. <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%

30. <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%

31. <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%

32. <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**.

33. <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%

34. <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.

35. <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%

36. <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%

37. <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.

38. <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%

39. <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%

40. <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%

41. <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%

42. <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. Hasan Ferit Eniser, Valentin Wüstholz and <u>Maria Christakis</u>. **Automatically Testing Functional Properties of Code Translation Models**. CoRR abs/2309.12813, 2023.

2. Alperen Tercan, Ahana Ghosh, Hasan Ferit Eniser, <u>Maria Christakis</u> and Adish Singla. **Synthesizing a Progression of Subtasks for Block-Based Visual Programming Tasks**. CoRR abs/2305.17518, 2023.

3. <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.

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 (Extended)**. CoRR abs/2107.08583, 2021.

5. 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.

6. 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.

7. 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.

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

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

10. 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.

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

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

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

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

15. 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.

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

17. <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.

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

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

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

21. <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.

22. <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"
General chair	:	ISSTA'24
Program Committee (co-)chair	:	VSTTE'20
Track (co-)chair	:	ECOOP/ISSTA'21 Workshops, ECOOP'19 Artifact Evaluation, PLDI'19 Student Research Competition, ECOOP'18 Artifact Evaluation, PLDI'18 Student Research Competition
Steering Committee member	:	ISSTA (since 2022), DeFi Security Summit (since 2022)
Program Committee member	:	AAAI'24, 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 2020–2023), ACM TOSEM (on the Board of Distinguished Reviewers 2019-2023), IEEE Software (2016), Systems and Software (2016), JLAMP (2014), TSE (2013, 2019), STTT (2013)
External Hiring Committee member	:	ETH Zurich (2023)
Panel member	:	"A View from the Trenches (from Junior and Mid-Career Faculty Members)"
	:	at the New Faculty Symposium of ICSE'22
External reviewer	:	ERC CoG'23 (PE6), ISSTA'18, TAP'16, TACAS'16, VMCAI'16, FM'15, WFLP'14, FLOPS'14, OOPSLA'13, PADL'11, DAMP'10
Thesis reviewer	:	Ph.D. thesis by O. Haarklou Veileborg (Aarhus University, Denmark, 2023), Master's thesis by J. Eisenhut (Saarland University, Germany, 2022), 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 2023   Lecturer in "Software Engineering"
Bachelor's course
Faculty of Informatics,
TU Wien, Austria

2022–2023   Lecturer in "Advanced Software Engineering"
Master's course
Faculty of Informatics,
TU Wien, Austria

2022–2024   Lecturer in "Seminar in Software Engineering"
Master's seminar
Faculty of Informatics,
TU Wien, Austria

2022–2024   Lecturer in "Seminar for Master Students in Software Engineering & Internet Computing"
Master's seminar
Faculty of Informatics,
TU Wien, Austria

Fall 2022   Lecturer in "Orientation Bachelor with Honors of Informatics and Business Informatics"
Bachelor's seminar
Faculty of Informatics,
TU Wien, Austria

Fall 2020   Lecturer in "Program Analysis"
Master's course
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Spring 2020   Lecturer in "Machine Learning and Formal Methods"
Master's seminar
Department of Computer Science,
Saarland University, Germany

Fall 2019   Lecturer in "Research Topics in Software Reliability"
Master's seminar
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Fall 2019   Lecturer in "Program Analysis"
Master's course
Department of Computer Science,
Technical University of Kaiserslautern, Germany

Fall 2018   Lecturer in "Program Analysis"
Master's course
Department of Computer Science,
Technical University of Kaiserslautern and Saarland University, Germany

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

Spring 2017   Lecturer in "Programming for University Study"
               International-foundation-programme course
               School of Computing,
               University of Kent, England

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

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

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

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

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

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

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

2009–2011	Teaching assistant in "Programming Languages I"

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

2009–2011 Teaching assistant in "Computer Programming"
Diploma course
Department of Electrical and Computer Engineering,
National Technical University of Athens, Greece
Lecturers : Stathis Zachos, Nikolaos Papaspyrou, Dimitris Fotakis

Advisees

2024– Markus Fleischmann
PhD
TU Wien, Austria

2023– Anastasia Isychev
Postdoc
TU Wien, Austria

2023– Samuel Pilz
PhD
TU Wien, Austria

2023– Christoph Hochrainer
PhD
TU Wien, Austria

2023– David Kaindlstorfer
PhD
TU Wien, Austria

2019– Hasan Ferit Eniser
PhD
MPI-SWS, Germany

2024– Michael Strasser
Bachelor's thesis
TU Wien, Austria

2023– Florian Tesarek
Master's thesis
TU Wien, Austria

2023– Robin Knoll
Master's thesis
TU Wien, Austria

2023–   Philipp Leeb
         Master's thesis
         TU Wien, Austria

2023–   Jana Chadt
         Master's thesis
         TU Wien, Austria

2022–2024   Markus Fleischmann
             Automated Soundness Testing of Program Analyzers
             Master's thesis
             TU Wien, Austria

2020–2023   Jiradet Ounjai
             Enhancing Fuzzers and Fuzzer-Benchmarking Platforms
             Internship
             MPI-SWS, Germany and TU Wien, Austria

2018–2022   Muhammad Numair Mansur
             Automatically Detecting and Mitigating Issues in Program Analyzers
             PhD
             MPI-SWS, Germany
             Won the **Ernst Denert Software Engineering Prize 2023**

2022   Sofia Barkatsa
         Automatically Testing Abstract Interpreters
         Internship
         MPI-SWS, Germany

2022   Andrea Borgarelli
         Enhancing Fuzzing Mutations with Reinforcement Learning
         Research immersion lab
         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. 68th IFIP WG2.4 (Online) Meeting on Software Implementation Technology, November 2023.

2. Research in Software Engineering (RiSE) Group, Microsoft Research Redmond, Washington, USA, July 2023.

3. SBA Research, Austria, June 2023.

4. Amazon Automated Reasoning Symposium, February 2023.

5. 65th IFIP WG2.4 (Online) Meeting on Software Implementation Technology, November 2021.

6. Technische Universität Wien (TU Wien), Austria, September 2021.

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

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

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

10. 62nd IFIP WG2.4 Meeting on Software Implementation Technology, Port Elizabeth, South Africa, January 2020.

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

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

13. Imperial College London, UK, November 2018.

14. 60th IFIP WG2.4 Meeting on Software Implementation Technology, Dijon, France, July 2018.

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

16. 59th IFIP WG2.4 Meeting on Software Implementation Technology, Essex, Vermont, USA, October 2017.

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

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

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

20. Aarhus University, Denmark, January 2017.

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

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

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

24. University of Kent, England, March 2016.

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

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

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

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

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

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

31. Imperial College London, UK, February 2013.

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

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

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

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

Software

- **GreenBench**: A green fuzzer-benchmarking platform

- **Nomos**: A specification language and framework for expressing and testing k-safety properties of machine-learning models

- **DLSmith**: A dependency-aware metamorphic-testing framework for Datalog engines

- 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

- **tAllor**: 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	:	Intermediate proficiency