

Filip Nikšić

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Research Interests

Broadly, I am interested in the analysis, verification, and testing of concurrent and distributed systems. My doctoral research focused on applying combinatorial techniques to systematic and random testing of distributed systems. More recently, I have been working on programming models and testing techniques for distributed stream processing.

Education

09/2012–05/2019

Max Planck Institute for Software Systems

Doctor of Engineering (Dr.-Ing.) degree by Technische Universität Kaiserslautern
Dissertation: *Combinatorial Constructions for Effective Testing*
Grade: summa cum laude

10/2009–10/2011

Department of Mathematics, University of Zagreb

Enrolled in a doctoral program in mathematics

07/2004–10/2009

Department of Mathematics, University of Zagreb

Dipl. Ing. (4-year degree) in Mathematics (profile: Computer Science)
GPA: 4.7 / 5.0

Work Experience

09/2020–present

Google, New York, NY

Software engineer

10/2018–07/2020

University of Pennsylvania, Philadelphia, PA

Postdoctoral researcher, working with Rajeev Alur

09/2012–10/2018

Max Planck Institute for Software Systems, Kaiserslautern, Germany

Doctoral researcher, advised by Rupak Majumdar

05/2016–08/2016

Microsoft, Redmond, WA

Research intern working on a testing and fault-injection framework for concurrent software. Technologies: C#, .NET Compiler Platform (“Roslyn”)

04/2010–09/2012

IN2 d.o.o., Zagreb, Croatia

Software engineer developing financial software. Technologies: Oracle DB (SQL, PL/SQL), Java (Spring Framework), and Adobe Flex

Teaching Experience

01/2019–05/2019

University of Pennsylvania

Occasional lectures and a student project for CIS 540: Principles of Embedded Computation (Spring 2019)

10/2016–02/2017

Max Planck Institute for Software Systems (MPI-SWS)

Teaching assistant: Program Analysis (Winter 2016/2017)

04/2014–07/2014

Max Planck Institute for Software Systems (MPI-SWS)

Teaching assistant: Verification of Reactive Systems (Summer 2014)

03/2008–09/2009

Department of Mathematics, University of Zagreb

Student assistant: Set Theory (Summer 2008), Introduction to Parallel Computing (Winter 2008), Application of Parallel Computers (Summer 2009).

09/2002–06/2005

Informatics Club NET, Ivanić-Grad

Tutored high school students for programming competitions

Awards

ACM SIGPLAN John Reynolds Dissertation Award, 2020

Professional Service

Artifact evaluation committee: ISSTA 2015, ECOOP 2018, CAV 2019

Conference reviews: CAV 2013, CSL 2013, FMCAD 2013, EMSOFT 2014, FMCAD 2014, LICS 2014, CADE 2015, VMCAI 2015, POPL 2016, TACAS 2016, VMCAI 2017, ICALP 2018, CAV 2021

Journal reviews: ACM Transactions on Computational Logic, Acta Informatica, Order

Technical Skills

Operating systems: GNU/Linux, Mac OS X, Windows

Programming languages: C/C++, C#, Java, Python, PL/SQL, ActionScript (Flex)

Databases: Oracle DB

Language Skills

Croatian (native), English (fluent), German (basic)

Publications

Konstantinos Kallas, Filip Niksic, Caleb Stanford, Rajeev Alur. *Stream Processing with Dependency-guided Synchronization*. PPoPP 2022

Rui Abreu, Franjo Ivančić, Filip Nikšić, Hadi Ravanbakhsh, Ramesh Viswanathan. *Reducing Time-to-Fix for Fuzzer Bugs*. ASE 2021

Rajeev Alur, Phillip Hilliard, Zachary G. Ives, Konstantinos Kallas, Konstantinos Mamouras, Filip Niksic, Caleb Stanford, Val Tannen, Anton Xue. *Synchronization Schemas*. PODS 2021

Konstantinos Kallas, Filip Niksic, Caleb Stanford, Rajeev Alur. *DiffStream: Differential Output Testing for Stream Processing Programs*. PACMPL 4 (OOPSLA) 2020

Cezara Drăgoi, Constantin Enea, Burcu Kulahcioglu Ozkan, Rupak Majumdar, Filip Niksic. *Testing Consensus Implementations Using Communication Closure*. PACMPL 4 (OOPSLA) 2020

Filip Niksic. *Combinatorial Constructions for Effective Testing*. Doctoral dissertation. Technische Universität Kaiserslautern, May 2019

Burcu Kulahcioglu Ozkan, Rupak Majumdar, Filip Niksic. *Checking Linearizability Using Hitting Families*. PPoPP 2019

Burcu Kulahcioglu Ozkan, Rupak Majumdar, Filip Niksic, Mitra Tabaei Befrouei, Georg Weissenbacher. *Randomized Testing of Distributed Systems with Probabilistic Guarantees*. PACMPL 2 (OOPSLA) 2018

Recipient of OOPSLA 2018 Distinguished Paper Award

Rupak Majumdar, Filip Niksic. *Why is Random Testing Effective for Partition Tolerance Bugs?* PACMPL 2 (POPL) 2018

Dmitry Chistikov, Rupak Majumdar, Filip Niksic. *Hitting Families of Schedules for Asynchronous Programs*. CAV 2016

Ivan Gavran, Filip Niksic, Aditya Kanade, Rupak Majumdar, Viktor Vafeiadis. *Rely/Guarantee Reasoning for Asynchronous Programs*. CONCUR 2015

Sumit Gulwani, Mikaël Mayer, Filip Nksic, Ruzica Piskac. *StriSynth: Synthesis for Live Programming*. ICSE 2015

Javier Esparza, Ruslán Ledesma-Garza, Rupak Majumdar, Philipp Meyer, Filip Nksic. *An SMT-Based Approach to Coverability Analysis*. CAV 2014

Johannes Kloos, Rupak Majumdar, Filip Nksic, Ruzica Piskac. *Incremental, Inductive Coverability*. CAV 2013

New York, NY, February 18, 2023