Andrei Ştefănescu
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Research Interests

Programming languages and formal methods, with focus on program analysis, program verification, and automated reasoning.

Education

2009–2016	**University of Illinois at Urbana-Champaign (UIUC)** Ph.D. in Computer Science Advisor: Grigore Rosu Thesis: Toward Language-Independent Program Verification Awards: David J. Kuck Outstanding Ph.D. Thesis Award and Nomination to the ACM Doctoral Dissertation Award Competition
2005–2009	**"Politehnica" University of Bucharest, Romania** B.Sc. in Computer Science and Engineering

Professional Experience

2016 Oct–Present	**Reseach Scientist**, Facebook Inc.
2016 Jul–Sep	**Principal Investigator (PI)**, NSF I-Corps award #1646559. Conducted customer discovery to evaluate the commercial potential of rewriting-based technologies for program transformation.
2014 May–Aug	**Intern**, Runtime Verification Inc. Worked on the automated proofs for program verification, focusing on heap-manipulating programs implementing complex data-structures.
2013 May–Aug	**Intern**, Runtime Verification Inc. Worked on symbolic and concrete execution of programs based on $\mathbb{K}$ language definitions.
2010 May–Aug	**International Fellow**, SRI International. Worked on developing benchmarks for a parallel rewrite engine.
2009 Feb–Aug	**Visiting student**, School of Computing, National University of Singapore (NUS). Worked with Chin Wei Ngan on separation logic based verification of LLVM programs. This work constituted my Bachelor's thesis.
2008 Jul–Oct	**Visiting student**, Computer Science Department, University of Illinois at Urbana-Champaign (UIUC). Worked with Grigore Rosu on runtime verification.

Projects

$\mathbb{K}$ verification infrastructure	Program verification infrastructure that takes an operational semantics (defined in $\mathbb{K}$) and turns it into an automatic correct-by-construction verifier. Throughout, I was also a core developer of the $\mathbb{K}$ framework. `http://github.com/kframework/k/wiki/Program-Verification`
MatchC	Prototype program verifier for a C fragment, implemented in Maude based on matching logic and reachability logic. Subsumed by the $\mathbb{K}$ infrastructure. `http://matching-logic.org/index.php/Special:MatchCOnline`
SMT-Maude	Extension of the Maude rewrite engine with the SMT-LIB standard and integration with the CVC3 SMT solver. Now incorporated in the official Maude distribution. `https://code.google.com/p/pl-maude`

Honors

2017	David J. Kuck Outstanding Ph.D. Thesis Award
2016	Nomination to the ACM Doctoral Dissertation Award Competition
2016	ACM SIGPLAN Distinguished Paper Award at OOPSLA 2016
2009–2012	Illinois Distinguished Fellowship
2005–2009	Scholarship, "Politehnica" University of Bucharest
2005	President of Romania's "Award of Excellence"
2005	Silver Medal, International Mathematical Olympiad, Merida, Mexico
2005	Gold Medal, Balkan Mathematical Olympiad, Iaşi, Romania
2005	1st place, National Mathematical Olympiad, Romania
2004	Silver Medal, International Mathematical Olympiad, Athens, Greece
2003	Silver Medal, International Mathematical Olympiad, Tokyo, Japan
2003	Silver Medal, Balkan Mathematical Olympiad, Tirana, Albania
2002	6th place, National Computer Science Olympiad, Romania

Publications

Refereed Conference Papers

OOPSLA'16	**Semantics-Based Program Verifiers for All Languages.** Andrei Ştefănescu, Daejun Park, Shijiao Yuwen, Yilong Li, and Grigore Roşu. *Conference on Programming Language Design and Implementation (OOPSLA)*, Amsterdam, Netherlands, November 2016. ACM SIGPLAN **Distinguished Paper Award**. Acceptance rate 52/203 (25%).
PLDI'15	**KJS: A Complete Formal Semantics of JavaScript.** Daejun Park, Andrei Ştefănescu, and Grigore Roşu. *Conference on Programming Language Design and Implementation (PLDI)*, Portland, Oregon, June 2015. Acceptance rate 58/303 (19%).

RTA-TLCA'14 **All-Path Reachability Logic.** Andrei Ştefănescu, Stefan Ciobâcă, Radu Mereuţă, Brandon Moore, Traian Florin Şerbănuţă, and Grigore Roşu. *Joint Conference on Rewriting Techniques and Applications and Typed Lambda Calculus and Applications (RTA-TLCA)*, Vienna, Austria, July 2014. Acceptance rate 31/87 (35%). (This paper was invited for journal submission.)

LICS'13 **One-Path Reachability Logic.** Grigore Roşu, Andrei Ştefănescu, Stefan Ciobâcă, and Brandon Moore. *Symposium on Logic In Computer Science (LICS)*, New Orleans, USA, June 2013. Acceptance rate 57/165 (34%).

PLDI'13 **Natural Proofs for Structure, Data, and Separation.** Xiaokang Qiu, Pranav Garg, Andrei Ştefănescu, and Parthasarathy Madhusudan. *Conference on Programming Language Design and Implementation (PLDI)*, Seattle, Washington, June 2013.

OOPSLA'12 **Checking reachability using matching logic.** Grigore Roşu and Andrei Ştefănescu. *Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Tucson, Arizona, October 2012. Acceptance rate 57/228 (25%).

FM'12 **From Hoare Logic to Matching Logic Reachability.** Grigore Roşu and Andrei Ştefănescu. *International Symposium on Formal Methods (FM)*, Paris, France, August 2012. Acceptance rate 35/132 (26%).

ICALP'12 **Towards a Unified Theory of Operational and Axiomatic Semantics.** Grigore Roşu and Andrei Ştefănescu. *International Colloquium on Automata, Languages and Programming (ICALP)*, Warwik, UK, July 2012. Acceptance rate 30/105 (28%).

POPL'12 **Recursive Proofs for Inductive Tree Data-Structures.** Parthasarathy Madhusudan, Xiaokang Qiu, and Andrei Ştefănescu. *Symposium on Principles of Programming Languages (POPL)*, Philadelphia, Pennsylvania, January 2012. Acceptance rate 44/205 (21%).

ICSE/NIER'11 **Matching Logic: A new Program Verification Approach.** Grigore Roşu and Andrei Ştefănescu. *International Conference on Software Engineering (ICSE), New Ideas and Emerging Results Track)*, Honolulu, Hawaii, May 2011. Acceptance rate 46/198 (23%).

Refereed Journal Papers

JLAMP'16 **Language Definitions as Rewrite Theories.** Vlad Rusu, Dorel Lucanu, Traian-Florin Şerbănuţă, Andrei Arusoaie, Andrei Ştefănescu, and Grigore Roşu. *Journal of Logical and Algebraic Methods in Programming (JLAMP)*, 85(1):98–120.

Refereed Workshop Papers

WRLA'14 **Language Definitions as Rewrite Theories.** Andrei Arusoaie, Dorel Lucanu, Vlad Rusu, Traian-Florin Şerbănuţă, Andrei Ştefănescu, and Grigore Roşu. *International Workshop on Rewriting Logic and its Applications (WRLA)*, Grenoble, France, April 2014.

K'11 **MatchC: A Matching Logic Reachability Verifier Using the K Framework.** Andrei Ştefănescu. *International K Workshop*, Cheile Grădiştei, Romania, August 2011. *Electronic Notes in Theoretical Computer Science*, Volume 304, 2014.

Service

Grant Proposals	Helped with preparing proposals for NSF (SHF:Small, awarded $400,000 for the period 2012–2015) and for NSA (awarded $750,000 for the period 2010–2013)
Program Committee	Artifact Evaluation Committee, ISSTA'14
Paper Reviewer	TACAS'16, OOPSLA'15 ($\times$ 2), CAV'15 ($\times$ 2), FM'15, FoSSaCS'14, FSE'14 ($\times$ 4), ICTAC'14, CMCS'14, PPDP'14, WADT'14, WRLA'14, ASE'13 ($\times$ 2), LPAR'13, NFM'13, PLAS'13, ASE'12, LPAR'12
Mentor	Mentored progress of 4 junior doctoral students and 2 undergraduate students

Teaching Experience

2013–2014	**Teaching assistant**, University of Illinois at Urbana-Champaign. Course taught: Programming Languages and Compilers.
2007–2008	**Teaching assistant**, "Politehnica" University of Bucharest. Courses taught: Algorithm Design and Introduction to Operating Systems.

Presentations

2014	**All-Path Reachability Logic.** *Joint Conference on Rewriting Techniques and Applications and Typed Lambda Calculus and Applications (RTA-TLCA)*, Vienna, Austria.
2012	**Checking Reachability using Matching Logic.** *Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Tucson, Arizona.
2012	**From Hoare Logic to Matching Logic Reachability.** *International Symposium on Formal Methods (FM)*, Paris, France.
2011	**Matching Logic Verification using the K Framework.** *Midwest Verification Day (MVD)*, Minneapolis, Minnesota.
2011	**MatchC: A Matching Logic Reachability Verifier Using the K Framework.** *International K Workshop*, Cheile Grădiştei, Romania.
2010	**Matching Logic: An Alternative to Hoare Logic.** *Midwest Verification Day (MVD)*, Iowa City, Iowa.