

Andrei Ștefănescu

Ph.D. Student

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Research Interests

Programming languages and formal methods, with focus on improving software quality via program verification.

Education

- 2009–2016 expected **University of Illinois at Urbana-Champaign (UIUC)**
Ph.D. in Computer Science
Advisor: Grigore Rosu
- 2005–2009 **“Politehnica” University of Bucharest, Romania**
B.Sc. in Computer Science and Engineering

Publications

Refereed Conference Papers

- PLDI'15 **KJS: A Complete Formal Semantics of JavaScript.** Daejun Park, Andrei Ștefănescu, and Grigore Roșu. *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 Ștefănescu, Stefan Ciobăcă, Radu Mereuță, Brandon Moore, Traian Florin Șerbănuță, and Grigore Roșu. *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 Roșu, Andrei Ștefănescu, Stefan Ciobăcă, 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 Ștefănescu, and Parthasarathy Madhusudan. *Conference on Programming Language Design and Implementation (PLDI)*, Seattle, Washington, June 2013.
- OOPSLA'12 **Checking reachability using matching logic.** Grigore Roșu and Andrei Ștefănescu. *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)*, Warwick, 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 Arusoai, 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 Arusoai, 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.

Projects

- \mathbb{K} infrastructure Program Verification infrastructure that takes an operational semantics (in \mathbb{K}) and turns it into an automatic correct-by-construction verifier.
<http://www.kframework.org/>
- 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

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, Iași, 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

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 (× 2), CAV’15 (× 2), FM’15, FoSSaCS’14, FSE’14 (× 4), ICTAC’14, CMCS’14, PPDP’14, WADT’14, WRLA’14, ASE’13 (× 2), LPAR’13, NFM’13, PLAS’13, ASE’12, LPAR’12
Mentor	Mentored progress of 4 junior doctoral students and 2 undergraduate students

Professional Experience

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.

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 Grădiștei, Romania.
- 2010 **Matching Logic: An Alternative to Hoare Logic.**
Midwest Verification Day (MVD), Iowa City, Iowa.