

Curriculum Vitae

Hossein Hojjat

Assistant Professor

Department of Computer Science

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Research Interests

- Formal Methods, Software Verification, Analysis and Synthesis, Automated Reasoning

Education & Professional Background

- **Rochester Institute of Technology** Rochester, United States
Tenure-Track Assistant Professor Aug. 2016 -
- **Cornell University** Ithaca, United States
Postdoctoral Researcher Feb. 2014 - Jul. 2016
 - Working under supervision of Prof. Nate Foster
 - NYC ASCENT Fellow
- **EPFL** Lausanne, Switzerland
Postdoctoral Researcher Sep. 2013 - Dec. 2013
 - Member of Rigorous System Design Laboratory under supervision of Prof. Joseph Sifakis
- **EPFL** Lausanne, Switzerland
PhD Student Sep. 2008 - Aug. 2013
 - Ph.D. Dissertation: “Automatic Verification with Abstraction and Theorem Proving” under supervision of Prof. Viktor Kuncak
 - Member of ProgLab.Net project funded by Microsoft Research
 - Relevant courses (grades are out of 6): Advanced algorithms (Amin Shokrollahi-6), Logic and Automata Theory (Radu Iosif, Barbara Jobstmann-6), Problem solving in computer science (Tom Henzinger-5), Advanced topics in software analysis and verification (Viktor Kuncak-5.5), Distributed algorithms (Rachid Guerraoui-5)

Education & Professional Background (Cont.)

- **University of Tehran** Tehran, Iran
Msc., Software Engineering (Grades: 18.99 / 20) *Sep. 2005 - Nov. 2007*
 - Enrolled as a top student without passing the entrance examinations
 - Thesis title: “Formal verification of the object-based systems using process algebra” under supervision of Prof. Marjan Sirjani and Prof. Mohammad Reza Mousavi
 - Defended with honors (19.8 / 20)
 - Relevant courses: Network Security, Performance Evaluation of Computer Systems, Software Architecture, Verification of Concurrent Systems
- **University of Tehran** Tehran, Iran
Bs. Software Engineering (Grades 17.69 / 20) *Sep. 2001 - Sep. 2005*
 - Graduated with Honors, second position
 - Relevant courses: Software Engineering, Internet Engineering, Advanced Algorithm Design, Digital Logic Circuits, Compiler Design, Advanced Software Engineering

Work Experience

- **IPM School of Computer Science** Tehran, Iran
Student Research Assistant *Sep. 2005 - Sep. 2008*
 - Project title: Verification of network protocols
 - In the organization committee of summer and winter schools
 - * Process theory - summer 2007
 - * Foundations and Trends in Computer Science - winter 2008
- Formal Methods Laboratory** University of Tehran, Iran
Researcher and Programmer *Sep. 2005 - Sep. 2008*
 - Formal verification of SystemC designs
- Technische Universiteit Eindhoven** Eindhoven, The Netherlands
Research Visitor *Nov. 2007 - Jan. 2008*
 - Process algebraic verification of hardware systems
- Niroom Research Center** Tehran, Iran
Internship in IT Management *Jun. 2005 - Sep. 2005*
 - Application of CRM software in a power distribution company

Funding Awarded

- SaTC: CORE: Small: Collaborative: A New Approach to Federated Network Security, National Science Foundation. September 2017-August 2020 (\$167,450.00)

Editorial and Review Activities

- Chair
 - FMCAD'16 Student Forum
- Program Committee Member
 - CSSE'13, FSEN'15,'17 - PC member & Publicity Chair, TTCS'17, VSTTE'17, SEFM'17
- Guest Editor
 - Science of Computer Programming (Special issue devoted to FSEN'13,FSEN'15)
- Member of the organizing committee
 - FSEN'05, FSEN'07, FSEN'11 and FSEN'13
- Reviewer for the conferences & journals
 - Conference: CONCUR'16,TACAS'16,DISC'15,GandALF'15,FMCAD'15,OOPSLA'15,PLDI'15,SODA'15,SEFM'14,LPAR'13,ACSD'13,VSTTE'12,SAS'11,ESOP'11,FSEN'07
 - Journal: IEEE-ESL'14, PeerJ CS'15
- Proceedings Manager
 - International Conference on Coordination Models and Languages (COORDINATION 2012)
 - Fundamentals of Software Engineering (FSEN 2011, 2013, 2015)

Publications

Conference Papers

- Hossein Hojjat, Philipp Rümmer: “Deciding and Interpolating Algebraic Data Types by Reduction”, Proceedings of the 19th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC'17)
- Jedidiah McClurg, Hossein Hojjat, Pavol Cerny: “Synchronization Synthesis for Network Programs”, Proceedings of the 29th International Conference on Computer Aided Verification (CAV'17)
- Shrutarshi Basu, Nate Foster, Hossein Hojjat, Paparao Palacharla, Christian Skalka, Xi Wang: “Life on the Edge: Unraveling Policies into Configurations”, Proceedings of the ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS'17)
- Hossein Hojjat: “The FMCAD 2016 graduate student forum”, Proceedings of the 16th International Conference on Formal Methods in Computer-Aided Design (FMCAD'16)

- Hossein Hojjat, Philipp Rümmer, Jedidiah McClurg, Pavol Cerny, Nate Foster: “Optimizing Horn Solvers for Network Repair”, Proceedings of the 16th International Conference on Formal Methods in Computer-Aided Design (FMCAD’16)
- Jedidiah McClurg, Hossein Hojjat, Nate Foster, Pavol Cerny: “Event-driven Network Programming” , Proceedings of the 37th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI’16)
- Jedidiah McClurg, Hossein Hojjat, Pavol Černý, Nate Foster: “Efficient Synthesis of Network Updates”, Proceedings of the 36th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI’15)
- Sudip Roy, Lucja Kot, Gabriel Bender, Bailu Ding, Hossein Hojjat, Christoph Koch, Nate Foster, Johannes Gehrke: “The Homeostasis Protocol: Avoiding Transaction Coordination Through Program Analysis”, Proceedings of the 2015 ACM SIGMOD International Conference on Management of Data (SIGMOD’15)
- Hossein Hojjat, Jedidiah McClurg, Pavol Černý, Nate Foster: “Network Updates for the Impatient: Eliminating Unnecessary Waits”, Proceedings of the First Workshop on Programming Languages and Verification Technology for Networking (PLVNET’15)
- Hossein Hojjat, Philipp Rümmer, Pavle Subotic, Wang Yi: “Horn Clauses for Communicating Timed Systems”, Proceedings of the First Workshop on Horn Clauses for Verification and Synthesis (HCVS’14)
- Philipp Rümmer, Hossein Hojjat, Viktor Kuncak: “Classifying and Solving Horn Clauses for Verification”, Proceedings of the 5th International Conference on Verified Software: Theories, Tools, Experiments (VSTTE’13)
- Philipp Rümmer, Hossein Hojjat, Viktor Kuncak: “Disjunctive Interpolants for Horn-Clause Verification” , Proceedings of the 25th International Conference on Computer Aided Verification (CAV’13)
- Hossein Hojjat, Radu Iosif, Filip Konečný, Viktor Kuncak and Philipp Rümmer: “Accelerating Interpolants”, Proceedings of the 10th International Symposium on Automated Technology for Verification and Analysis (ATVA’12)
- Hossein Hojjat, Filip Konečný, Florent Garnier, Radu Iosif, Viktor Kuncak and Philipp Rümmer: “Verification Toolkit for Numerical Transition Systems (tool paper)”, Proceedings of the 18th International Symposium on Formal Methods (FM’12)
- Bahman Pourvatan, Marjan Sirjani, Hossein Hojjat and Farhad Arbab: “Analysis of Reo Circuits using Symbolic Execution”, Proceedings of the 8th International Workshop on the Foundations of Coordination Languages and Software Architectures (FOCLASA’09)
- Hossein Hojjat, Mohammad Reza Mousavi, Marjan Sirjani: “Process Algebraic Verification of SystemC Codes”, Proceedings of the 8th International Conference on Application of Concurrency to System Design (ACSD’08)

- Hossein Hojjat, Mohammad Reza Mousavi, Marjan Sirjani: “A Framework for Performance Evaluation and Verification in Stochastic Process Algebras”, Proceedings of the 22nd ACM Symposium on Applied Computing, Software Verification Track (SV’08)
- Hossein Hojjat, Marjan Sirjani, Mohammad Reza Mousavi and Jan Friso Groote: “Sarir: A Rebeca to mCRL2 Translator”, Proceedings of the 7th IEEE International Conference on Application of Concurrency to System Design (ACSD’07)
- Fahimeh Raja , Hadi Amiri , Samira Tasharofi, Hossein Hojjat and Farhad Oroumchian: “Evaluation of part of speech tagging on Persian text”, Proceedings of the Second Workshop on Computational Approaches to Arabic Script-based Languages (CAASL’07)
- Hadi Amiri, Hosein Hojjat, Farhad Oroumchian: “Investigation on a Feasible Corpus For Persian POS Tagging” (in Persian), Proceedings of the 12th International CSI Computer Conference (CSICC’07)
- Hossein Hojjat, Hootan Nakhost, Marjan Sirjani: “Formal Verification of the IEEE 802.1D Spanning Tree Protocol Using Extended Rebeca”, Proceedings of the First IPM International Workshop on Foundations of Software Engineering (FSEN’05)

Journal Papers

- Philipp Rümmer, Hossein Hojjat, Viktor Kuncak: “On recursion-free Horn clauses and Craig interpolation”, Formal Methods in System Design, v.47, n. 1, pp. 1-25, 2015.
- Bahman Pourvatan, Marjan Sirjani, Hossein Hojjat and Farhad Arbab: “Symbolic Execution of Reo Circuits using Constraint Automata”, Science of Computer Programming, Elsevier, v. 77, n. 7-8, pp. 848-869, 2012.
- Hossein Hojjat, Mohammad Reza Mousavi, Marjan Sirjani: “Formal Analysis of SystemC Designs in Process Algebra”, Fundamenta Informaticae, v. 107, n. 1, pp. 19-42, 2011.
- Hossein Hojjat, Hootan Nakhost, Marjan Sirjani: “Integrating Module Checking and Deduction in a Formal Proof for the Perlman Spanning Tree Protocol (STP)”, J.UCS Journal of Universal Computer Science, v. 13, n. 13, pp. 2076-2104, 2007.

Technical Reports

- Jedidiah McClurg, Hossein Hojjat, Nate Foster, Pavol Černý: “Specification and Compilation of Event-driven SDN Programs”, CoRR abs/1507.07049, 2015.
- Hossein Hojjat, Philipp Rümmer, Pavle Subotic, Wang Yi: “Uniform Analysis for Communicating Timed Systems (Extended Technical Report)”, EPFL-REPORT-190680, 2013.
- Hossein Hojjat, Mohammad Reza Mousavi Mousavi, Marjan Sirjani: “Application of process algebraic verification and reduction techniques to SystemC designs”, Computer Science Report No. 08-15, Technische Universiteit Eindhoven, 2008.

- Farhad Oroumchian, Samira Tasharofi, Hadi Amiri, Hossein Hojjat, Fahimeh Raja: “Creating a Feasible Corpus for Persian POS Tagging”, Technical Report Number TR 3/2006, University of Wollongong in Dubai, 2006.

Management and Leadership

- Attended “Postdoc Leadership Development Program”, Cornell University (2014-2015)
 - <http://postdocs.cornell.edu/professional-development>
- Vice Chair of University of Tehran ACM Student Chapter (2003-2004)
 - <http://acm.ut.ac.ir/acm/flats/officers?lang=en>

National Prizes

- Graduated with Honors (second position in the Computer Engineering), University of Tehran (2005)
- Enrolled in the graduate school as a top student without passing the entrance examinations, University of Tehran (2005)

Software Development

- Main developer of Eldarica, a predicate abstraction engine.
 - <http://lara.epfl.ch/w/eldarica>
- SystemC to mCRL2 Toolkit
 - <http://www.win.tue.nl/~mousavi/sysc08>
- Sarir: Rebeca to mCRL2 translator
 - <http://ece.ut.ac.ir/fml/sarir.htm>
- Stochastic Process Algebras to mCRL2 translator
 - <http://www.win.tue.nl/~mousavi/spa>

Teaching

Undergraduate

- Programming Language Concepts (CSCI-344): Fall 2016, RIT.

Graduate

- Compiler Construction (CSCI-742): Spring 2017, Spring 2018, RIT.
- Programming Language Theory (CSCI-740): Fall 2017, RIT.

Teaching Assistance**Undergraduate**

- Introduction to Computer Programming (Fattane Taghiyareh) : Fall 2002, University of Tehran.
- Languages and Automata Theory (Ali Mahjur) : Fall 2003, Spring 2004, University of Tehran.
- Artificial Intelligence (Hesham Faili) : Spring 2004, Fall 2004, University of Tehran.
- Advanced Computer Programming (Hossein Sheikh Attar) : Spring 2004, University of Tehran
- Programming Languages Design (Marjan Sirjani) : Fall 2005, University of Tehran.
- Informatique III (SSV) (Sebastian Gerlach) : Fall 2009, EPFL.
- Compiler Construction (Viktor Kuncak) : Fall 2010, EPFL.
- Informatique Théorique Avancée (Gregory Theoduloz) : Spring 2011, EPFL.
- CareerEx: Collecting & Analyzing Water Quality Data (Nate Foster) : June-July 2015, Cornell University.

Graduate

- Modeling and Verification of Concurrent Systems (Marjan Sirjani) : Spring 2006, Spring 2007.
- Synthesis, Analysis, and Verification (Viktor Kuncak) : Spring 2010

References

- Prof. Dr. Nate Foster, Cornell University
- Prof. Dr. Viktor Kuncak, EPFL
- Prof. Dr. Marjan Sirjani, Malardalen University