

Eunsuk Kang

CONTACT INFORMATION	University of California, Berkeley EECS Department 545K Cory Hall Berkeley, CA 94720 USA	eunsuk.kang@berkeley.edu https://eskang.github.io
RESEARCH INTERESTS	Software reliability, verification, modeling, design methodologies, security, system safety.	
EDUCATION	Ph.D. in Electrical Engineering and Computer Science , February 2016. Massachusetts Institute of Technology, Cambridge, MA USA <ul style="list-style-type: none">• Thesis: <i>Multi-Representational Security Modeling and Analysis</i>.• Advisor: Prof. Daniel Jackson S.M. in Electrical Engineering and Computer Science , February 2010. Massachusetts Institute of Technology, Cambridge, MA USA <ul style="list-style-type: none">• Thesis: <i>A Framework for Dependability Analysis of Software with Trusted Bases</i>.• Advisor: Prof. Daniel Jackson Bachelor of Software Engineering , June 2007. University of Waterloo, Waterloo, ON Canada <ul style="list-style-type: none">• Advisors: Prof. Mark Aagaard, Prof. Joanne Atlee, Prof. Nancy Day	
AWARDS	ACM SIGSOFT Distinguished Paper Awards . International Symposium on the Foundations of Software Engineering (FSE), 2016. International Conference on Software Engineering (ICSE), 2015.	
RESEARCH EXPERIENCES	NSF Expeditions in Computer Augmented Program Engineering (ExCAPE) <i>Postdoctoral Researcher</i> 02/2016 - current <ul style="list-style-type: none">• Working with Prof. Stéphane Lafortune at the University of Michigan and Prof. Stavros Tripakis at the University of California, Berkeley on program synthesis techniques for security. Software Design Group , MIT, Cambridge, MA USA <i>Research Assistant</i> 09/2007 - 01/2016 <ul style="list-style-type: none">• Worked with Prof. Daniel Jackson on modeling and analyzing software systems for security and reliability. Case studies include a radiation therapy device, electronic voting systems, biometric software, web applications, and a water treatment system. NASA Jet Propulsion Laboratory , Pasadena, CA USA <i>Research Intern</i> 06/2011 - 08/2011 <ul style="list-style-type: none">• Worked with Dr. Rajeev Joshi on techniques for automated log analysis. Microsoft Research , Redmond, WA USA <i>Research Intern</i> 06/2009 - 09/2009 <ul style="list-style-type: none">• Worked with Dr. Ethan Jackson on Formula, a framework for modeling and verification of software systems. Developed a novel algorithm for design space exploration. Formal Methods Group , University of Waterloo, Waterloo, ON Canada <i>Research Assistant</i> 06/2003 - 12/2006	

- Worked with Prof. Joanne Atlee and Prof. Nancy Day on a tool that integrates a model checker and a theorem prover for analysis of software requirements specifications. Applied the tool on the specification of the A-7E aircraft control software.
- Worked with Prof. Mark Aagaard on techniques to improve proof automation and reduce the amount of human interactions in the HOL theorem prover.

CONFERENCE
PUBLICATIONS

Eunsuk Kang, Aleksandar Milicevic, and Daniel Jackson. Multi-Representational Security Analysis. *Symposium on the Foundations of Software Engineering (FSE)*, 2016. **ACM SIGSOFT Distinguished Paper Award.**

Jianye Hao, Eunsuk Kang, Jun Sun and Daniel Jackson. Designing Minimal Effective Normative Systems with the Help of Lightweight Formal Methods. *Symposium on the Foundations of Software Engineering (FSE)*, 2016.

Eunsuk Kang. Design Space Exploration for Security. *IEEE Conference on Cybersecurity Development (SecDev)*, 2016.

Aleksandar Milicevic, Joseph P. Near, Eunsuk Kang, and Daniel Jackson. Alloy*: A Higher-Order Relational Constraint Solver. *International Conference on Software Engineering (ICSE)*, 2015. **ACM SIGSOFT Distinguished Paper Award.**

Hamid Bagheri, Eunsuk Kang, Sam Malek, and Daniel Jackson. Detection of Design Flaws in the Android Permission Protocol through Bounded Verification. *International Symposium on Formal Methods (FM)*, 2015.

Joseph P. Near, Aleksandar Milicevic, Eunsuk Kang, and Daniel Jackson. A Lightweight Approach to Construction and Evaluation of a Dependability Case. *International Conference on Software Engineering (ICSE)*, 2011.

Eunsuk Kang and Daniel Jackson. Dependability Arguments with Trusted Bases. *International Conference on Requirements Engineering (RE)*, 2010.

Ethan Jackson, Eunsuk Kang, Dirk Seifert, Markus Dahlweid, and Thomas Santen. Components, Platforms, and Possibilities: Towards Generic Automation for MDA. *International Conference on Embedded Software (EMSOFT)*, 2010.

Eunsuk Kang and Daniel Jackson. Formal Modeling and Analysis of a Flash Filesystem. *International Conference on ASM, B, and Z (ABZ)*, 2008.

Eunsuk Kang and Mark Aagaard. Improving the Usability of HOL through Controlled Automation Tactics. *International Conference on Theorem Proving in Higher-Order Logics (TPHOLs)*, 2007.

JOURNAL
PUBLICATIONS

Aleksandar Milicevic, Joseph P. Near, Eunsuk Kang, and Daniel Jackson. Alloy*: A Higher-Order Relational Constraint Solver. *Formal Methods in System Design*, 2016 (under submission).

Hamid Bagheri, Eunsuk Kang, Sam Malek, and Daniel Jackson. Detection of Design Flaws in the Android Permission Protocol through Bounded Verification. *Formal Aspects of Computing*, 2016.

Jianye Hao, Eunsuk Kang, Jun Sun, Zan Wang, Zhaopeng Meng, Xiaohong Li, Zhong Ming. An Adaptive Markov Strategy for Defending Smart Grid False Data Injection from Malicious Attackers. *IEEE Transactions on Smart Grid (TSG)*. 2016.

Eunsuk Kang and Daniel Jackson. Designing and Analyzing a Flash File System with Alloy. *International Journal of Software and Informatics (IJSI)*, Vol. 3 No. 2, 2009.

- WORKSHOPS AND BOOK CHAPTERS
- Eunsuk Kang, Sridhar Adepu, Daniel Jackson, and Aditya P. Mathur. Model-Based Security Analysis of a Water Treatment System. *Workshop on Smart Cyber-Physical Systems*, part of *International Conference on Software Engineering (ICSE)*, 2016.
- Eunsuk Kang, Santiago Perez De Rosso, and Daniel Jackson. The Same-Origin Policy. A book chapter in *500 Lines or Less*, part of the *Architecture of Open Source Applications*, 2016.
- Jianye Hao, Eunsuk Kang, Daniel Jackson, and Jun Sun. Adaptive Defending Strategy for Smart Grid Attacks. *Workshop on the Smart Energy Grid Security*, part of *ACM Conference on Computer and Communications Security (CCS)*, 2014.
- Daniel Jackson and Eunsuk Kang. Separation of Concerns for Dependable Software Design. *Workshop on the Future of Software Engineering Research (FoSER)*, co-located with the *Symposium on the Foundations of Software Engineering (FSE)*, 2010.
- Eunsuk Kang and Daniel Jackson. Patterns for Building Dependable Systems with Trusted Bases. *Pattern Languages of Programs Conference (PLOP)*, 2010.
- Daniel Jackson and Eunsuk Kang. Property-Part Diagrams: A Dependence Notation for Software Systems. A book chapter in *Software Design and Requirements: The Work of Michael Jackson* (eds. Bashar Nuseibeh and Pamela Zave), Good Friends Publishing Company, New Jersey, 2010.
- Eunsuk Kang, Ethan Jackson, and Wolfram Schulte. Generalizing Design Space Exploration. *Monterey Workshop on Software Systems*, 2010.
- RESEARCH MENTORING
- Xavier Gillard. Web-based visualization framework for Alloy. Master's student, Université catholique de Louvain, 06/2015-08/2015.
- Asa Oines. Model-based testing of Git using Alloy. Undergraduate research assistant, MIT, 02/2014 - 05/2014.
- Jose Pinheiro and Tiago Guimaraes. Model-based testing of Git using Alloy. Master's students, MIT & University of Minho, 02/2013 - 06/2013.
- Christopher Dessonville. Automating diagnosis of CCS errors. Undergraduate research assistant, MIT, 02/2013 - 05/2013.
- Renato Neves and Claudio Lourenco. Modeling of Git in Alloy. Master's students, MIT & University of Minho, 02/2012 - 06/2012.
- Justin Holmgren. Analysis of Facebook privacy settings. Undergraduate research assistant, MIT, 02/2012 - 05/2012.
- TEACHING EXPERIENCES
- 6.170 Software Studio**, Curriculum Development, MIT, 01/2013 - 04/2013.
- 6.088 Introduction to C/C++ Programming**, Instructor, MIT, 01/2010.
- 6.00 Introduction to Computer Science and Programming**, Teaching Assistant, MIT, 09/2009 - 12/2009.
- 6.005 Elements of Software Construction**, Teaching Assistant, MIT, 09/2008 - 12/2008.
- TALKS
- Designing Minimal Effective Normative Systems with the Help of Lightweight Formal Methods. Conference presentation at FSE, November 2016.

Multi-Representational Security Analysis.

Conference presentation at FSE, Nov 2016.

Systems Seminar, University of Michigan, Mar 2016.

BAE Systems, May 2015.

ExCAPE Seminar, Apr 2015.

Institute for Software Integrated Systems, Vanderbilt University, April 2015.

Design Space Exploration for Security. Conference presentation at SecDev, Nov 2016.

Architectural and Design Analysis for Secure Cyber-Physical Systems. Invited talk at the Secure Cyber-Physical Systems Week, Singapore, July 2016.

Detection of Design Flaws in the Android Permission Protocol through Bounded Verification. Conference presentation at FM, June 2015.

High-Level Languages for Configuration Modeling and Analysis. Dagstuhl Seminar on Product and Software Configuration, April 2014.

Automating End User Security Tasks. Invited talk at MIT CSAIL Security Seminar, November 2012.

Alloy: A Language for Modeling and Analyzing Software Systems. Invited talk at the 14th Real-Time Linux Workshop (RTLWS), Chapel Hill, North Carolina, October 2012.

Dependability Arguments with Trusted Bases. Conference presentation at RE, October, 2010.

An Advanced Introduction to Alloy. Tutorial at the ABZ conference, February 2010.

Counter Example Detection, Core Extraction, and Simulation: Three Analyses Applied to a Flash File System Model. Invited talk at the Workshop on the Verified Software Repositories (VSR-net), co-located with ABZ, September 2008.

PROFESSIONAL
EXPERIENCES

Intel Corporation, Vancouver, BC Canada

Software Engineering Intern

01/2006 - 04/2006

- Designed and implemented a development tool for embedded programming on an Intel flash memory chip.

Environment Canada, Ottawa, ON Canada

Software Engineering Intern

09/2004 - 12/2004

- Designed an automation tool for generating weather forecast information in support of the Canadian Coast Guard.

SERVICES

- External Reviewer, International Conference on Tools and Algorithms for Construction and Analysis of Systems (TACAS), 2017.
- Program Committee, HASE Workshop on Security in Cyber-Physical Systems, 2017.
- Program Committee, International Symposium on High Assurance Systems Engineering (HASE), 2017.
- External Reviewer, Replication Packages, FSE, 2015.
- Reviewer, Journal of Security and Communication Networks, 2011.
- External Reviewer, Satisfiability Modulo Theories (SMT) Workshop, 2011.
- External Reviewer, Pervasive Computing (PERVASIVE), 2011.
- Reviewer, Journal of Systems and Software, 2010.
- Co-organizer, CSAIL Student Research Workshop, MIT, 2009.

CITIZENSHIP

Canada

REFERENCES

Daniel Jackson

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Massachusetts Institute of Technology

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Stéphane Lafortune

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Department of Electrical Engineering and Computer Science

University of Michigan, Ann Arbor

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