MANASVI SAXENA

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RESEARCH INTERESTS

Programming Language Semantics, Static and Dynamic Analysis, Language Independent Formal Verification and Debugging, Security, Blockchains

EDUCATION

M.S. Computer Science, University of Illinois – Urbana Champaign May 2018

- Relevant Coursework - Formal Methods of Software Development, Runtime Verification, Logic in Computer Science, Computer and Cryptocurrency Security
- GPA - 3.86/4.0

B.S. Computer Science, University of Illinois – Urbana Champaign May 2015

- Relevant Coursework - Programming Languages and Compilers, Fundamental Algorithms, Theory of Computation, Computer Networking, Artificial Intelligence
- GPA - 3.38/4.0

EXPERIENCE

Formal Systems Laboratory, University of Illinois August 2016 - Current
Researcher Assistant *Urbana, IL*

- Implementing a Proof Assistant (called the K Debugger) for the K Semantics Framework.
- K (`https://github.com/kframework/k`) is a rewrite based semantics framework in which programming languages can be defined using configurations, computations and rules. Proof Assistant will be used to prove program correctness, using the implementation of Matching Logic in K.
- Implementing the semantics of the ethereum Abstract Binary Interface (ABI) as a part of the KEVM (`http://github.com/kframework/evm-semantics`) project. The KEVM ABI abstraction exposes a higher-level language like layer for smart contract verification.

Runtime Verification Inc., Urbana, Illinois July 2015 - May 2016
Software Engineer *Urbana, IL*

- Worked on a team developing a dynamic analysis tool for finding undefined behavior in C programs, using formal semantics of C.
- Worked on improving tool's performance, and evaluated its applications on large codebases.

Formal Systems Laboratory, University of Illinois August 2014 - May 2015
Undergraduate Researcher *Urbana, IL*

- Developed a Semantics based Debugger for the K Semantics Framework.
- Debugger helps users find bugs in formal semantics defined in K. Allows users to step through the execution of their program, examine the state space, configurations, and rules among other features.

Coordinated Science Lab, University of Illinois Summer 2014
Undergraduate Researcher *Urbana, IL*

- Worked on visualization of a large dataset containing records of faulty medical devices by the Food and Drug Administration (FDA).
- Created an interactive web application that displays the visualizations using PHP/Javascript.

TEACHING EXPERIENCE

Undergraduate Course Assistant, CS 125 Fall 2012
University of Illinois *Urbana, IL*

- Held office hours during which helped students with programs encountered in programming assignments.
- Helped students understand concepts encountered in the course, such as recursion to students.

PROJECTS

KEVM - Semantics of the EVM in K github.com/kframework/evm-semantics

· Worked on formalizing the EVM in K. Currently working on capturing the semantics of the Ethereum ABI, as an extension to the original semantics. One of the administrators of the project.

K Semantics Framework github.com/kframework/k

· Core developer. In charge of developing debugging capabilities, and maintaining the rewrite engine.

PUBLICATIONS

Everett Hildenbrandt, Manasvi Saxena, Xiaoran Zhu, Nishant Rodrigues, Philip Daian, Dwight Guth, and Grigore Rosu. Kevm: A complete semantics of the ethereum virtual machine. `http://hdl.handle.net/2142/97207`

Dwight Guth, Chris Hathhorn, Manasvi Saxena, and Grigore Rosu. Rv-match: Practical semantics-based program analysis. In *Computer Aided Verification - 28th International Conference, CAV 2016, Toronto, ON, Canada, July 17-23, 2016, Proceedings, Part I*, volume 9779 of *LNCS*, pages 447–453. Springer, July 2016

Philip Daian, Dwight Guth, Chris Hathhorn, Yilong Li, Edgar Pek, Manasvi Saxena, Traian Florin Serbanuta, and Grigore Rosu. Runtime verification at work: A tutorial. In *Runtime Verification - 16th International Conference, RV 2016 Madrid, Spain, September 23-30, 2016, Proceedings*, volume 10012 of *Lecture Notes in Computer Science*, pages 46–67. Springer, September 2016

TECHNICAL SKILLS

Programming Languages	Java, Scala, Python, C, C++, OCaml
Miscellaneous	Git, Intellij IDEA, Eclipse, PyCharm, LaTeX