

Matt Staats

University of Minnesota, Twin Cities
Department of Computer Science and Engineering
4-192 EE/CS Bldg. 200 Union Street S.E.
Minneapolis, MN 55455
staats@cs.umn.edu
<http://www.cs.umn.edu/~staats>

- Education**
- University of Minnesota-Twin Cities** Minneapolis, Minnesota
2006-Present Currently pursuing a Ph.D. in Computer Science
Adviser: Dr. Mats P.E. Heimdahl.
- University of Missouri-Rolla** Rolla, Missouri
2002-2006 B.S. Computer Science Minors: Math, Psychology
- Professional Experience**
- University of Minnesota-Twin Cities** Minneapolis, Minnesota
2007–Present Research assistant and member of Crisys Research Group led by Dr. Mats Heimdahl. Developed tools for automated testing, including tools to measure requirements coverage of tests and conduct automated experiments related to the effectiveness of various test coverage metrics. Developed familiarity with the NuSMV model checker, CBMC model checker, Java Pathfinder execution environment, and R statistical environment.
- NASA Ames Research Center** Moffett Field, CA
Summer 2009 Summer intern in the Robust Software Engineering group. Developed extensions to the Java Pathfinder execution environment to improve performance of Symbolic Java Pathfinder through parallelized execution, with the overall goal of increasing automatic test generation performance. Extensions include a general, extensible framework for parallelizing Java Pathfinder, structural search heuristics for improving Modified Condition/Decision Coverage (MC/DC) test generation performance, and heuristics for partitioning a symbolic execution tree and distributing the partitions across multiple instances of Java Pathfinder.
- NASA Ames Research Center** Moffett Field, CA
August 2008 Summer intern in the Robust Software Engineering group. Developed extensions to the Java Pathfinder model checker to improve test generation capability. Extensions include an Eclipse plugin to automatically instrument Java code to generate MC/DC tests, functionality to allow generated tests to be run on instrumented code, and functionality to improve the flexibility of test generation when using symbolic execution.
- Cerner Corporation** Kansas City, Missouri
Summer '06, '04 Worked with a team to develop an Eclipse based Java interface for use in an automated pharmacy system. Extended Eclipse GUI elements to create in-house GUI design. Improved reliability of Visual Basic software by fixing reported software errors.
- U.S. Geological Survey** Rolla, Missouri
2004-2006 Worked with a three man team to create a interactive browser-based map viewing application for distributed USGS map data. Developed back end server-side code to allow map data to be converted from GML and ESRI map formats. Developed client-side browser based interface using JavaServer Faces and Javascript.
- Publications**
- 5 refereed conference papers.
- [1] **Matt Staats** and Corina Pasareanu. Parallel Symbolic Execution for Structural Test Generation. *International Symposium on Software Testing and Analysis 2010 – ISSTA 2010*. Trento, Italy, July, 2010. 11 Pages.
- [2] **Matt Staats**, Michael Whalen, Ajitha Rajan and Mats Heimdahl. Coverage Metrics for Requirements-Based Testing: Evaluation of Effectiveness. *NASA Formal Methods Symposium 2010 – NFM'10*. Washington, D.C., USA, April, 2010. 10 Pages.
- [3] **Matthew Staats** and Mats P.E. Heimdahl. Partial Translation Verification for Untrusted Code-Generators. *Proceedings of the 10th International Conference on Formal Engineering Methods – ICFEM'08*. Kitakyushu-City, Japan, October, 2008. 14 Pages.
- [4] Ajitha Rajan, Michael W. Whalen, **Matthew Staats** and Mats P.E. Heimdahl. Requirements Coverage as an Adequacy Measure for Conformance Testing. *Proceedings of the 10th International Conference on Formal Engineering Methods – ICFEM'08*. Kitakyushu-City, Japan, October, 2008. 20 Pages.

[5] Erik Shimshock, **Matt Staats** and Nick Hopper. Breaking and Provably Fixing Minx. *Proceedings of the 8th Privacy Enhancing Technologies Symposium – PETS’08*. Leuven, Belgium, July, 2008. 16 Pages.

Short Papers 1 tools paper, 1 short paper.

[6] **Matt Staats**. Towards a Framework for Generating Tests to Satisfy Complex Code Coverage in Java Pathfinder. *NASA Formal Methods Symposium 2009 - NFM’09*. Moffett Field, California, USA, April, 2009. 2 Pages.

[7] **Matt Staats**, Weijia Deng, Ajitha Rajan, Mats P.E. Heimdahl. ReqsCov: A Tool for measuring Test Adequacy over Requirements. *Proceedings of the 23rd International Conference on Automated Software Engineering - ASE’08*. L’Aquila, Italy, September, 2008. 2 Pages.

Other Papers 1 other paper.

[8] Mats P.E. Heimdahl, Michael W. Whalen, Ajitha Rajan, and **Matt Staats**. On MC/DC and Implementation Structure: An Empirical Study. *Proceedings of the 27th IEEE Digital Avionics Systems Conference*. October, 2008. 10 Pages. **Selected Best Paper in Software Design Session**.

Presentations 3 conference talks, 1 tool demo.

April 2010 [2] presented at *NFM 2010*, Washington, D.C., USA.

April 2009 [6] presented at *NFM 2009*, Moffett Field, California, USA.

November 2008 [7] presented at *ASE 2008*, L’Aquila, Italy.

November 2008 [3] presented at *ICFEM 2008*, Kitakyushu-City, Japan.

Teaching Experience **University of Minnesota-Twin Cities** Minneapolis, Minnesota

Summer 2008 **Teaching Assistant** CSCI 5801: Software Engineering I. Developed programming assignments around the concepts of system specification, documentation and bug testing. Scored tests and quizzes.

Spring 2007 **Teaching Assistant** CSCI 3081: Program Design and Development. Developed programming assignments around the C++ language to help reinforce the concepts of good program design and development practices from course lectures.

Fall 2006 **Teaching Assistant** CSCI 3081: Program Design and Development. Same as above.

Service Activities

Reviewer ACM Transactions on Software Engineering and Methodology (TOSEM) Reviewer, 2009.