Alex David Groce

Education

Ph.D., **Computer Science**, Carnegie Mellon University, March 2005

B.S., **Computer Science, Multidisciplinary Studies**, North Carolina State University, May 1999 (*summa cum laude*)

Experience

Summary: My work focuses on testing, developing, specifying, and understanding critical distributed, embedded, aerospace, systems, and security software and software/hardware systems. I have been PI or co-PI on externally funded grants totalling over $9.1M ($1.2M my share), and have authored or co-authored more than 60 publications, primarily in ACM, IEEE, and top verification and formal methods venues, with over 3,100 citations, an h-index of 29, and an i10-index of 50, according to Google Scholar.

1/2017–present · **Associate Professor with Tenure, Northern Arizona University**

9/2015–12/2016 · **Associate Professor with Tenure, Oregon State University**

6/2009–9/2015 · **Assistant Professor, Oregon State University**

4/2005–6/2009 · **Laboratory for Reliable Software, NASA Jet Propulsion Laboratory:** Led test automation development and design, Mars Science Laboratory (Curiosity rover) Flight Software Internal Test Team.

Honors

ACM/IEEE International Conference on Software Engineering 2016 **Distinguished Poster Award**

IEEE International Conference on Software Testing, Verification and Validation (ICST) 2014 **Best Paper Award**

National Science Foundation Faculty **Early Career Development (CAREER) Program Award**, 2011

JPL Mariner Award for LogScope Testing Software, 2009

JPL Spot Award (for Multi Mission System Architecture Platform (MSAP) File System Testing), 2006

ACM/IEEE International Conference on Software Engineering 2003 **ACM SIGSOFT Distinguished Paper Award**

Funding

"Interfaces, Models, and Monitoring for Resource-aware Transformations that Augment the Lifecycle of Systems (IMMoRTALS)", Co-PI, DARPA BRASS (Building Resource Adaptive Software Systems), BAA-15-36, $464,625, $1.6M total Oregon State University budget, (total project budget $7.7M), October 2015-September 2019.

"Advanced Tools for Effective Automated Test Generation", PI, *NASA Small Business Technology Transfer Phase I* T11.01-9878, $52,037 (total budget $125,000), July 2015-2016.

"Explorations of Testing in the Cloud", PI, Amazon Web Services in Education Grants, $10,000, January 2015-2017.

"II-EN: Software Tools for Monte-Carlo Optimization", Co-PI, *National Science Foundation* CNS-1406049, $442,366, October 2014-September 2017 (infrastructure development for cloud-based optimization tools with ML, graphics, and testing applications; includes $12,000 dedicated compute time for software testing research).

"Diversity and Feedback in Random Testing for Systems Software", PI, *National Science Foundation* CCF-1217824, $242,244 (total budget $491,280), September 2012-2015.

"CAREER: Integrating Automated Software Testing Methods", PI, *National Science Foundation* CCF-1054876, $400,000, September 2011-2016.

Selected Recent Journal Publications

Rahul Gopinath, Iftekhar Ahmed, Mohammad Amin Alipour, Carlos Jensen, and **Alex Groce**. Does Choice of Mutation Tool Matter? *Software Quality Journal*, 25(3):871-920, September 2017.

Alex Groce, Mohammad Amin Alipour, Chaoqiang Zhang, Yang Chen, and John Regehr. Cause Reduction: Delta Debugging, Even Without Bugs. *Software Testing, Verification and Reliability*, 26(1):40-68, January 2016.

Milos Gligoric, **Alex Groce**, Chaoqiang Zhang, Rohan Sharma, Mohammad Amin Alipour, and Darko Marinov. Guidelines for Coverage-Based Comparisons of Non-Adequate Test Suites. *ACM Transactions on Software Engineering and Methodology*, 24(4):4-37, August 2015.

Alex Groce, Todd Kulesza, Chaoqiang Zhang, Shalini Shamasunder, Margaret Burnett, Weng-Keen Wong, Simone Stumpf, Sh ubhomoy Das, Amber Shinsel, Forrest Bice, and Kevin McIntosh. You Are the Only Possible Oracle: Effective Test Selection for End Users of Interactive Machine Learning Systems. *IEEE Transactions on Software Engineering*, 40(3):307-323, March 2014.

Selected Recent Conference Publications

Arpit Christi, **Alex Groce**, and Rahul Gopinath. Resource Adaptation via Test-Based Software Minimization. *IEEE International Conference on Self-Adaptive and Self-Organizing Systems*, accepted for publication, Tucson, Arizona, September 2017 (acceptance rate 21%).

Alex Groce, Josie Holmes, and Kevin Kellar. One Test to Rule Them All. *ACM International Symposium on Software Testing and Analysis*, pp. 1-11, Santa Barbara, California, July 2017 (acceptance rate 26%).

Rahul Gopinath, Carlos Jensen, and **Alex Groce**. The Theory of Composite Faults. *IEEE International Conference on Software Testing, Verification and Validation*, pp. 47-57, Tokyo, Japan, March 2017 (acceptance rate 27%).

Iftekhar Ahmed, Rahul Gopinath, Caius Brindescu, **Alex Groce**, and Carlos Jensen. Can Testedness be Effectively Measured? *ACM SIGSOFT International Symposium on the Foundations of Software Engineering*, pp. 547-558, Seattle, Washington, November 2016 (acceptance rate 27%).

Mohammad Amin Alipour, August Shi, Rahul Gopinath, Darko Marinov, and **Alex Groce**. Evaluating Non-Adequate Test-Case Reduction. *IEEE/ACM International Conference on Automated Software Engineering*, pp. 16-26, Singapore, Singapore, September 2016 (acceptance rate 20%).

Rahul Gopinath, Amin Alipour, Iftekhar Ahmed, Carlos Jensen, and **Alex Groce**. On the Limits of Mutation Reduction Strategies. *International Conference on Software Engineering*, pp. 511-522, Austin, Texas, May 2016 (acceptance rate 19%).

Chaoqiang Zhang, **Alex Groce**, and Mohammad Amin Alipour. Using Test Case Reduction and Prioritization to Improve Symbolic Execution. *ACM International Symposium on Software Testing and Analysis*, pp. 60-70, San Jose, California, July 2014 (acceptance rate 28%).

Rahul Gopinath, Carlos Jensen, and **Alex Groce**. Code Coverage for Suite Evaluation by Developers. *International Conference on Software Engineering*, pp. 72-82, Hyderabad, India, May-June 2014 (acceptance rate 20%).

Alex Groce, Mohammad Amin Alipour, Chaoqiang Zhang, Yang Chen, and John Regehr. Cause Reduction for Quick Testing. *IEEE International Conference on Software Testing, Verification and Validation*, pp. 243-252, Cleveland, Ohio, March-April 2014 (acceptance rate 28%), **Best Paper Award**.

Yang Chen, **Alex Groce**, Chaoqiang Zhang, Weng-Keen Wong, Xiaoli Fern, Eric Eide, and John Regehr. Taming Compiler Fuzzers. *ACM SIGPLAN Conference on Programming Language Design and Implementation*, pp. 197-208, Seattle, Washington, June 2013 (acceptance rate 17%).

September, 2017