

Alex D. Groce

Professional Preparation

North Carolina State University	Computer Science	B.S.	1999
North Carolina State University	Multidisciplinary Studies	B.S.	1999
Carnegie Mellon University	Computer Science	Ph.D.	2005

Appointments

2005–	Researcher, Laboratory for Reliable Software, Jet Propulsion Laboratory
2008 (3rd Term)	Lecturer in Computer Science at California Institute of Technology

Five Publications Most Closely Related to the Proposed Project

1. K. Havelund, A. Groce, G. Holzmann, R. Joshi, and M. Smith. Automated Testing of Planning Models. *Proceedings of MOCHART'08, the Fifth International Workshop on Model Checking and Artificial Intelligence*, Patras, Greece (July 2008).
2. A. Groce and R. Joshi. Exploiting Traces in Static Program Analysis: Better Model Checking through `printfs`. *International Journal on Software Tools for Technology Transfer*, Vol. 10, Issue 2, pp. 131-144 (March 2008).
3. A. Groce and R. Joshi. Extending Model Checking with Dynamic Analysis. *Proceedings of the VMCAI'08, the Ninth International Conference on Verification, Model Checking and Abstract Interpretation*, San Francisco, CA, Springer, LNCS Vol. 4905 (January 2008).
4. A. Groce, D. Peled, and M. Yannakakis. Adaptive Model Checking. *Logic Journal of the IGPL (Interest Group in Pure and Applied Logic)*, Vol. 14, Issue 5, pp. 729-744 (October 2006).
5. D. Kroening, A. Groce, and E. Clarke. Counterexample Guided Abstraction Refinement via Program Execution. *Proceedings of ICFEM'04, the Sixth International Conference on Formal Engineering Methods*, Seattle, WA, Springer, LNCS Vol. 3308 (November 2004).

Five Other Significant Publications

1. J. Andrews, A. Groce, M. Weston and R. Xu. Random Test Run Length and Effectiveness. *Proceedings of the Twenty-Third IEEE/ACM International Conference on Automated Software Engineering*, to appear (September 2008).
2. A. Groce, G. Holzmann, and R. Joshi. Randomized Differential Testing as a Prelude to Formal Verification. *Proceedings of the Twenty-Ninth International Conference on Software Engineering*, pp. 621-631, IEEE Computer Society (May 2007).
3. S. Chaki, E. Clarke, A. Groce, S. Jha, and H. Veith. Modular Verification of Software Components in C. *IEEE Transactions on Software Engineering*, Vol. 30, Issue 6, pp. 388-402 (June 2004).
4. S. Chaki, A. Groce. and O. Strichman. Explaining Abstract Counterexamples. *Proceedings of the Twelfth ACM SIGSOFT International Symposium on Foundations of Software Engineering*, pp. 73-82, ACM (November 2004).

5. A. Groce. Error Explanation with Distance Metrics. *Proceedings of TACAS 2004: Tenth International Conference on Tools and Algorithms for the Construction and Analysis of Systems*, Lecture Notes in Computer Science, Vol. 2988, pp. 108-122, Springer-Verlag (April 2004).

Synergistic Activities: Five Examples

1. Developer, along with Rajeev Joshi, of a series of tools and methodologies for using the SPIN model checker on complex embedded systems, and integrating model checking and random testing.
2. Developed and taught a course on software testing and monitoring (CS 119 Reliable Software: Testing and Monitoring) to be taught each year at the California Institute of Technology, as part of a series of courses taught by JPL Laboratory for Reliable Software members focusing on reliable software engineering, from semantics and model checking to software testing. During same effort contributed to network of academics seeking to establish a standard curriculum and set of projects for courses in formal software testing.
3. Developed algorithms for automatically localizing and explaining errors in Java and C programs, and helped establish this as a recognized subfield of model checking research with outreach to software engineering and testing researchers, in the Verification and Debugging Workshop at the Conference on Automated Verification in 2006.
4. Contributed significant design and implementation work to software analysis tools used internationally for research, industrial application, and teaching, including Java PathFinder 2, CBMC, MAGIC, SyMP, and the Concurrency Workbench (NC).
5. Reviewer for numerous IEEE and ACM journals, conferences, and workshops, National Sciences and Engineering Research Council of Canada, NASA Small Business Innovation Research (SBIR) program, Israel Science Foundation; program committee member, Seventh Workshop on Specification and Verification of Component-Based Systems, Fourteenth International Workshop on Model Checking Software, and First International Workshop on Verification and Debugging.

Collaborators During Last 48 months and Co-Editors During Last 24 months

Andrews, James (U. Western Ontario, Canada); Chaki, Sagar (Software Engineering Institute); Clarke, Edmund (Carnegie Mellon); Havelund, Klaus (Jet Propulsion Laboratory); Holzmann, Gerard (Jet Propulsion Laboratory); Jha, Somesh (U. Wisconsin, Madison) Joshi, Rajeev (Jet Propulsion Laboratory); Kroening, Daniel (Oxford, United Kingdom); Lerda, Flavio (Google); Ouaknine, Joel (Oxford, United Kingdom); Smith, Margaret (Jet Propulsion Laboratory); Strichman, Ofer (Technion, Israel); Peled, Doron (Bar Ilan U., Israel / U. Warwick, United Kingdom); Veith, Helmut (TU Darmstadt, Germany); Visser, Willem (SEVEN Networks); Weston, Melissa (U. Western Ontario, Canada); Xu, Ru-Gang (U. California, Los Angeles); Yannakakis, Mihalis (Columbia); Yorav, Karen (IBM Haifa Research Lab, Israel)

Graduate and Postdoctoral Advisors

Clarke, Edmund, Carnegie Mellon University.