

Bruce M. Adcock

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PROFILE

I am a post-candidacy Ph.D. student in computer science at The Ohio State University, focusing on software verification. I lead the development of an in-house tool to simplify verification conditions using special decision procedures and using the surprising natural structure of verification conditions. I received an M.S. in computer science in December of 2008, and will complete my Ph.D. in the summer of 2010.

EDUCATION

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|--------------|---|-------------------------------|
| 2005-present | Ph.D. Computer Science & Engineering
<i>The Ohio State University; Columbus, OH</i>
<i>Thesis: "Working Towards a Verified Software Process"</i>
<i>Advisor: Bruce W. Weide</i> | <i>August 2010 (expected)</i> |
| 2005-2008 | M.S. Computer Science & Engineering
<i>The Ohio State University; Columbus, OH</i> | <i>December 2008</i> |
| 2001-2004 | M.S. Mathematics
<i>The Ohio State University; Columbus, OH</i> | <i>March 2004</i> |
| 1997-2001 | B.S. Mathematics
<i>Lafayette College; Easton, PA</i> | <i>May 2001</i> |

TEACHING EXPERIENCE

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|----------|--|---|
| Lecturer | CSE 222: Development of Software Components
<i>The Ohio State University</i>
Lecture and grade exams for the second of three classes at OSU (CSE 221/222/321) for first-year majors in computer science. This is a required course for any student to major in Computer Science and Engineering, Computer and Information Science, or Electrical and Computing Engineering with the computer option. C++. Class sizes range from 20 to 40 students. | <i>Autumn 2007–Present (Alternating Quarters)</i> |
| Grader | CSE 755: Programming Languages
Graded projects and homework for the graduate-level course on programming language theory, part of the core curriculum for incoming graduate students. Projects implement <i>Lisp</i> . Class size of 40 students. | <i>Spring 2009, Winter 2008</i> |
| Grader | CSE 668: Applied Component-Based Programming for Engineers and Scientists
Graded projects for a course teaching the application of component-based software engineering, for third-year, fourth-year, and graduate students. Labs in <i>C#</i> . Class size of 30 students. | <i>Winter 2009</i> |
| Grader | CSE 222: Development of Software Components
Graded homework and labs for my own class. Class size of 30 students. | <i>Autumn 2007</i> |

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- Recitation Leader **Math 104: Basic College Mathematics** *Winter 2006, Autumn 2005*
Led recitation for multiple sections of beginning algebra. Developed quizzes and worksheets. Graded exams, quizzes, homework, and worksheets. Sections of 30 students each, 4 sections in Autumn 2005, 2 sections in Winter 2006.
- Lecturer **Math 116: Excursions in Mathematics** *Summer 2005*
Lectured, graded, and developed homework, quizzes, worksheets, and exams on a variety of topics in modern mathematics and their relevance in real life. Course covers such topics as voting theory, error-correcting codes, graph theory, and scheduling theory. Class size of 30 students.
- Recitation Leader **Math 116: Excursions in Mathematics** *Spring 2005*
Led recitation for two sections of Math 116. Developed quizzes and worksheets for recitations. Graded exams, quizzes, homework, and worksheets. Sections of 30 students each.
- Recitation Leader **Math 152: Calculus and Analytic Geometry II** *Winter 2005*
Led recitation for two sections of the second quarter of the standard calculus sequence. Developed quizzes for recitations. Graded exams, quizzes, and homework. Sections of 30 students each.
- Recitation Leader **Math 153: Calculus and Analytic Geometry III** *Autumn 2004*
Led recitation for two sections of the third quarter of the standard calculus sequence. Developed quizzes for recitations. Graded exams, quizzes, and homework. Sections of 30 students each.
- Lecturer **Math 152: Calculus and Analytic Geometry II** *Spring 2004*
Lectured, graded, and developed homework, quizzes, and exams for the second quarter of the standard sequence in calculus. Class size of 30 students.
- Lecturer **Math 151: Calculus and Analytic Geometry I** *Winter 2004*
Lectured, graded, and developed homework, quizzes, and exams for the first quarter of the standard sequence in calculus. Class size of 30 students.
- Recitation Leader **Math 132: Mathematical Analysis for Business III** *Autumn 2003*
Led recitation for two sections of the second quarter of the calculus for business students. Developed quizzes for recitations. Graded exams, quizzes, and homework. Sections of 30 students each.
- Lecturer **Math 150: Elementary Functions** *Summer 2003*
Lectured, graded, and developed homework, worksheets, quizzes, and exams for the preparatory course for calculus. Class size of 30 students.
- Recitation Leader **Math 131: Mathematical Analysis for Business II** *Spring 2003*
Led recitation for two sections of the first quarter of the calculus for business students. Developed quizzes for recitations. Graded exams, quizzes, and homework. Sections of 30 students each.

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- Recitation Leader **Math 150: Elementary Functions** *Autumn 2002, Winter 2003*
Led recitation for two sections each quarter for the preparatory course for calculus. Developed quizzes for recitations. Graded exams, quizzes, and homework. Sections of 30 students each.
- Tutor **Calculus & Mathematics** *2000-2001*
Lafayette College
Tutored students in calculus level mathematics, and assisted students in Mathematics for their labs.

UNIVERSITY ACTIVITIES & SERVICE

- Mentor **Undergraduate Research Mentoring** *2009-Present*
The Ohio State University
Mentoring of a third-year student on his work with the Europa undergraduate research group.
- Presenter **External Advisory Board** *2009, 2008*
Presented research to external advisory board, met to discuss department.
- Panelist **Graduate Student Recruitment** *2009, 2008, 2003, 2002*
Assisted in giving campus tours, answering questions in graduate student panel, and evaluating prospective graduate students.
- Reviewer **International Conference on Software Reuse II** *2009*
Reviewed two papers submitted to ICSR 11.
- Reviewer **IEEE Transactions on Intelligent Transportation Systems** *2009*
Reviewed paper for IEEE journal.
- Juror **Denman Undergraduate Research Forum** *2007-2008*
Evaluated and ranked presentations by undergraduates from around OSU on their research.
- Representative **Lafayette College Alumni Admissions Representatives** *2001-2004*
Assisted Lafayette admissions with recruiting prospective students who were unable to visit the campus.

RESEARCH GRANTS AND AWARDS

- NSF **CPA-SEL: Collaborative Research — Continuing Progress Toward Verified Software**
Weide, B.W., Friedman, H.M., and Sitaraman, M., National Science Foundation, September 1, 2008 – August 31, 2010, \$232,591. Funded. Wrote five pages and reviewed related work.
- NSF **CDA-Type II: Humans in the Verified Software Paradigm**
Weide, B.W., Friedman, H.M., and Sitaraman, M., National Science Foundation, October 1, 2009 – September 30, 2013, \$1,641,641. Not funded. Assisted in writing and reviewed related work.

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HONORS, AWARDS, & AFFILIATIONS

- Award **Outstanding Teaching Award** 2010
Department of Computer Science and Engineering, The Ohio State University
Nominated by former students and department faculty for teaching award.
- Finalist **Graduate Poster Competition** 2009, 2008
Department of Computer Science and Engineering, The Ohio State University
Finalist on post-candidacy students research poster competition in 2009.
- Fellowship **Graduate Fellowship** Autumn 2001–Summer 2002
- Member **ACM, SIGSOFT** 2007–Present
- Member **Pi Mu Epsilon** Inducted in 2000

PUBLICATIONS

- ISCA 2010 **Generalized Turbocode-Based Error Correction for Near-Threshold Caches**
Miller, T., Dinan, J., Kasiviswanathan, S., Thomas, R., **Adcock, B.**, Teodorescu, R., *The 37th International Symposium on Computer Architecture*, submitted.
- OOPSLA 2009 **Traditional Assignment Considered Harmful**
Pike, S., Heym, W., **Adcock, B.**, Bronish, D., Kirschenbaum, J., Weide, B.W., *OOPSLA '09: Proceeding of the 24th ACM SIGPLAN conference companion on Object oriented programming systems languages and applications*, ACM, October 2009, pp. 909-916.
- FAC **Building a Push-Button RESOLVE Verifier: Progress and Challenges**
Sitaraman, M., **Adcock, B.**, Avigad, J., Bronish, D., Bucci, B., Frazier, D., Friedman, H.M., Harton, Heym, W., Kirschenbaum, J., Krone, J., Smith, H., and Weide, B.W., *Formal Aspects of Computing*, to appear; original version appeared as Technical Report RSRG-09-01, School of Computing, Clemson University, Clemson, SC 29634-0974, January 2009, 34 pages.
- ICSR II **Verifying Component-Based Software: Deep Mathematics or Simple Bookkeeping?**
Kirschenbaum, J., **Adcock, B.**, Bronish, D., Smith, H., Harton, H., Sitaraman, M., Weide, B.W., *Proceedings of the 11th International Conference on Software Reuse: Formal Foundations of Reuse and Domain Engineering*, Springer-Verlag, LNCS 5791, September 2009, pp. 31-40. **Presented.**
- ICSR II **The OSU RESOLVE Software Verification Tool Suite**
Adcock, B., Kirschenbaum, J., Bronish, D., ICSR Tool Demos, ICSR 11, September 2009. **Co-presented.**
- ICSR II **Working Towards the Verified Software Process**
Adcock, B., Doctoral Symposium, ICSR 11, September 2009. **Presented.**

- RESOLVE 2009 **The Beginning of the End of Debugging as We Know It**
Adcock, B., *RESOLVE 2009*, September 2009, at
<http://www.cse.ohio-state.edu/rsrg/RESOLVE-2009/> . **Presented.**
- Tech Report **A Systematic Analysis of Assignment Primitives**
Pike, S.M., Heym, W.D., **Adcock, B.**, Bronish, D., Kirschenbaum, J., Weide, B.W., Technical Report OSU-CISRC-8/09-TR39, Dept. of Computer Science and Engineering, The Ohio State University, Columbus, OH, August 2009, 11 pages.
- FSE 16 **Steps Toward Verified Software**
Adcock, B., Bronish, D., Kirschenbaum, J. Student Research Forum, *16th International Symposium on Foundations of Software Engineering*, November 2008.
- SAVCBS 2008 **Using Isabelle Theories to Help Verify Code That Uses Abstract Data Types**
Kirschenbaum, J., **Adcock, B.**, Bronish, D., Bucci, P., Weide, B.W., *SAVCBS 2008 (Specification and Verification of Component-Based Systems)*, workshop of SIGSOFT 2008/FSE 16, at
<http://www.cse.ohio-state.edu/rsrg/documents/2008/08KABBW.pdf> .
- VSTTE 2008 **Incremental Benchmarks for Software Verification Tools and Techniques**
Weide, B.W., Sitaraman, M., Harton, H.K., **Adcock, B.**, Bucci, P., Bronish, D., Heym, W.D., Kirschenbaum, J., and Frazier, D., *Proceedings of VSTTE 2008 (Verified Software: Theories, Tools, & Experiments)*, Springer-Verlag, LNCS 5295, October 2008, pp. 84-98.
- Tech Report **On Soundness of Verification for Software with Functional Semantics and Abstract Data Types**
Bronish, D., Kirschenbaum, J., **Adcock, B.**, Weide, B.W., Technical Report OSU-CISRC-5/08-TR26, Dept. of Computer Science and Engineering, The Ohio State University, Columbus, OH, May, 2008.
- SIGCSE 2007 **Which Pointer Errors Do Students Make?**
Adcock, B., Bucci, P., Heym, W.D., Hollingsworth, J.E., Long, T.J., and Weide, B.W., *Proceedings of the 38th SIGCSE Technical Symposium on Computer Science Education*, ACM Press, March 2007, pp. 9-13.
- CBP **Force Transmission Via Axial Tendons in Undulating Fish: A Dynamic Analysis**
Long, J.H., **Adcock, B.**, Root, R.G., *Comparative Biochemistry and Physiology Part A 133*, 2002, pp. 911-929.
- NCUR 2001 **Chinese Characters: Using Web-Based Learning to Improve and Expand Upon Current Methods of Studying Writing in Japanese**
Ariizumi, Y., **Adcock, B.**, *Proceedings of the National Conference on Undergraduate Research*, March 2001. **Presented.**

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- CG **Iterated Function Systems with Hyperbolic Symmetry**
Adcock, B., Jones, K.C., Reiter, C.A., and Vislocky, L.M., *Computers & Graphics*,
24, 2000, pp. 791-796.

ADDITIONAL WORK EXPERIENCE

- GRA **Computer Science & Engineering** *Winter 2007–Present (Alternating Quarters)*
The Ohio State University
Lead developer for prover used for software verification, allowing for the analysis of the structure of verification conditions, and making use of specialized decision procedures. A large project written in *RESOLVE/C++* (C++ with a strong component-design discipline enforced).
- GRA **Syrus Project** *Spring 2008–Present*
Developer for *Syrus*, a web tool to teach formal reasoning methods to undergraduate computer science students taking discrete mathematics. Using *jQuery* with *Javascript*, *Python*, and *MySQL*.
- GRA **Center for Automotive Research** *Summer 2006–Summer 2007*
The Ohio State University
Developed driver assisting interface for ChallengeX project in C++ with *SDL*. Put together small (20 node) Linux cluster for genetic algorithm problems with *GALib*, *Fortran*, and C++. Video editing with *Adobe Premiere* for distance learning project.
- EXCEL Scholar **Modeling Fish Swimming** *Winter 2000–Spring 2001*
Lafayette College
Generated mathematical model of swimming fish, taking into account forces from the muscles to determine the deformations. Used *Mathematica*.
- REU **Iterated Function Systems** *Summer 1999*
Used iterated function systems to generate images containing hyperbolic symmetries. Used *J*.

REFERENCES

- Ph.D. Advisor **Bruce W. Weide** (614) 292-1517 *weide.1@osu.edu*
Department of Computer Science and Engineering, The Ohio State University,
395 Dreese Lab, 2015 Neil Avenue, Columbus, OH 43210-1277
- Professor **Paul A. G. Sivilotti** (614) 292-5835 *paolo@cse.ohio-state.edu*
Department of Computer Science and Engineering, The Ohio State University,
395 Dreese Lab, 2015 Neil Avenue, Columbus, OH 43210-1277
- Professor **Murali Sitaraman** (864) 656-6738 *murali@cs.clemson.edu*
School of Computing, 210 McAdams, Clemson University, Clemson, SC, 29634-0974
- EXCEL Advisor **Robert G. Root** (610) 330-5280 *robroot@lafayette.edu*
Department of Mathematics, Lafayette College, 209 Pardee Hall, Easton, PA
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