

CURRICULUM VITAE

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Personal Data

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Research Interests

Quantifier-elimination for real closed fields, real solutions to nonlinear systems of polynomial equalities and inequalities, fundamental algorithms in computer algebra, computer algebra software systems, computer science education.

Education

Ph.D. Computer Science. May 1999. University of Delaware. Newark, DE.

M.S. Mathematical Computer Science. May 1994. University of Illinois at Chicago. Chicago, IL.

B.S. Mathematics. May 1992. University of Illinois at Urbana-Champaign. Urbana, IL.

Professional Experience

August 2005 to present:

Associate Professor, Department of Computer Science, United States Naval Academy.

August 1999 to July 2005:

Assistant Professor, Department of Computer Science, United States Naval Academy.

September 1998 to May 1999:

Research Assistant, Department of Computer and Information Sciences, University of Delaware.

June to August, 1999, 1998 and 1997:

Instructor, Department of Computer and Information Sciences, University of Delaware.

September 1996 to May 1997:

Teaching Assistant, Department of Computer and Information Sciences, University of Delaware.

October 1994 to August 1996:

Research Assistant, Research Institute for Symbolic Computation, Johannes Kepler University, Linz, Austria.

September 1992 to May 1994:

Teaching Assistant, Department of Mathematics, Statistics, and Computer Science, University of Illinois at Chicago.

Grants

Office of Naval Research, "Evaluation of an Intelligent Tutoring System for Elementary Data Structures in the U.S. Naval Academy CS and IT Curricula", Summer 2006.

National Science Foundation (Grant Number CCR-0306440), "RUI: Practical computing with semi-algebraic sets via cylindrical algebraic decomposition", May 2003 – May 2006. Principal Investigator: Christopher W. Brown.

Naval Academy Research Council grants: "Computing with Semi-Algebraic Sets Using Cylindrical Algebraic Decomposition", Summer 2000, 2001, 2002.

Publications

Christopher W. Brown and James H. Davenport, "The Complexity of Quantifier Elimination and Cylindrical Algebraic Decomposition", **Proceedings of the International Symposium on Symbolic and Algebraic Computation**, July 2007. To Appear.

Christopher W. Brown and Eric A. Hardisty, "RegeXeX: An Interactive System Providing Regular Expression Exercises", **Proceedings of the 38th ACM Technical Symposium on Computer Science Education**, SIGSCE'07, to appear.

Christopher W. Brown and Christian Groß, "Efficient Preprocessing Methods for Quantifier Elimination", **Proceedings of Computer Algebra in Scientific Computing (CASC '06)**, September, 2006.

Christopher W. Brown, M'hammed El Kahoui, Dominik Novotni and Andreas Weber, "Algorithmic Methods for Investigating Equilibria in Epidemic Modelling", A special issue of the **Journal of Symbolic Computation** on the conference Algorithmic Algebra and Logic, 2005, November, 2006.

Christopher W. Brown and Scott McCallum, "On Using Bi-equational Constraints in CAD Construction", **Proceedings of the International Symposium on Symbolic and Algebraic Computation**, July, 2005.

Christopher W. Brown, M'hammed El Kahoui, Dominik Novotni and Andreas Weber, "Algorithmic Methods for Computing Threshold Conditions in Epidemic Modelling", **Proceedings of Computer Algebra in Scientific Computing (CASC '04)**, July, 2004.

Christopher W. Brown, "QEPCAD B — a program for computing with semi-algebraic sets using CADs", **ACM SIGSAM Bulletin**, 37(4): 97-108, December 2003.

Christopher W. Brown, "An Overview of QEPCAD B: a Tool for Real Quantifier Elimination and Formula Simplification", **Journal of Japan Society for Symbolic and Algebraic Computation**, 10(1):13-22, July 2003.

Christopher W. Brown, "Improved Projection for Cylindrical Algebraic Decomposition", **Journal of Symbolic Computation**, November, 2001.

Christopher W. Brown, "Simple CAD Construction and its Applications", **Journal of Symbolic Computation**, May, 2001.

Christopher W. Brown, "Improved Projection for CAD's of \mathbf{R}^3 ", **Proceedings of**

the **International Symposium on Symbolic and Algebraic Computation**, July, 2000.

Christopher W. Brown, “Guaranteed Solution Formula Construction”, **Proceedings of the International Symposium on Symbolic and Algebraic Computation**, July, 1999.

Christopher W. Brown, “Simplification of Truth-Invariant Cylindrical Algebraic Decompositions”, in **Proceedings of the International Symposium on Symbolic and Algebraic Computation**, August 1998.

Oral Presentations

“Cylindrical algebraic decomposition and its applications”, short course at the **First RISC/SCIENCE Training School in Symbolic Computation**, Feb. 5-16, Castle of Hagenberg, Austria.

“AI Paradigms and the Computer Algebra Problem of Real Polynomial System Solving”, **Colloquium series of the Institut für Informatik of the University of Bonn**, October 2006.

“Quantifier Elimination and the Ellipticity of Systems of Partial Differential Equations”, at **Algorithmic Algebra and Logic (A3L 2005)**, April 2005. Presented with Sjaak de Vlaming.

“Calculating Convex Hulls of Semi-Algebraic Subsets of the Plane Symbolically”, at **Automated Deduction in Geometry (ADG2004)**, September 2004.

Invited tutorial “Cylindrical Algebraic Decomposition”, given at the **International Symposium on Symbolic and Algebraic Computation**, July, 2004.

Software Demo: “QEPCAD B: Computing with Semi-Algebraic Sets”, at the **International Symposium on Symbolic and Algebraic Computation**, August 2003 (Winner of the Best Software Award).

“Implementing Q.E. by CAD to be Complete, Correct, Fast and Good”, at **Applications of Computer Algebra**, July, 2002.

“Cylindrical Algebraic Decomposition and Simple Descriptions of Semi-Algebraic Sets”, at the workshop **Applications of Real Algebraic Geometry Outside Mathematics**, June 2001.

“Improved Projection for CAD’s of \mathbf{R}^3 ”, at the **International Symposium on Symbolic and Algebraic Computation**, July 2000.

“Guaranteed Solution Formula Construction”, at the **International Symposium on Symbolic and Algebraic Computation**, July 1999.

“Simplification of Truth-Invariant Cylindrical Algebraic Decompositions”, at the **International Symposium on Symbolic and Algebraic Computation**, August 1998.

“Simple Truth-Invariant CAD’s and Solution Formula Construction”, at the **2nd IMACS Conference on Applications of Computer Algebra**, July 1996.

Professional Activities

Proceedings editor for the ACM-sponsored conference ISSAC '07, (International Symposium on Symbolic and Algebraic Computation), Waterloo, Ontario, CA.

Program Committee member for:

Algebraic Biology (AB 2005), November 28-30, 2005, Tokyo, Japan.

Automated Deduction in Geometry (ADG 2004), September 16-18, 2004, University of Florida, USA.

International Conference on Polynomial System Solving, November 24-25-26 2004, Paris, France.

Algorithmic Algebra and Logic 2005, April 3-6, 2005, Passau, Germany.

Advisory Committee member for the East Coast Computer Algebra Day (ECCAD '04), Waterloo, Ontario.

Editor for formally reviewed articles, for Communications in Computer Algebra (the ACM SIGSAM Bulletin), June '04 to present.

Treasurer for the ACM-sponsored conference ISSAC '03 (International Symposium on Symbolic and Algebraic Computation), Philadelphia, PA.

Tutorials Chair for the ACM-sponsored conference ISSAC '01 (International Symposium on Symbolic and Algebraic Computation), London, Ontario.

National Science Foundation Grant Proposal Review Panelist, 2001, 2004. External reviewer for NSF CAREER proposal, 2004.

Referee for the Journal of Symbolic Computation, Mathematical Structures in Computer Science, Applicable Algebra in Engineering, Communication and Computing, the Proceedings of the International Symposium on Symbolic and Algebraic Computation, the proceedings of International Conference on Artificial Intelligence and Symbolic Computation, the Proceedings of Computer Algebra in Scientific Computing, the proceedings of the 2001 Schloss Dagstuhl symposium on Integration of Algebra and Geometry Software Systems, the Proceedings of the Asian Symposium on Computer Mathematics.

Teaching Experience

Instructor:

SI333 Algorithms and Functional Languages (Spring '04, '05, '06)

SI472 Theory of Computing (Fall '00, '03, '04, '05)

SI221 Data Structures I (Spring '03)

SI204 Introduction to Computer Science (Fall '01, '02, '04)

SI433 Advanced Computer Algorithms (Spring '00, '01, '02)

SI420 Artificial Intelligence (Fall '99)

SI332 Computer Architecture (Fall '99)

CISC220 Data Structures (Summer '99, '98, '97)

CISC120 Object-Oriented Programming in C++ (Summer '98, '97)