

BENJAMIN JAMES KELLER

ADDRESS:

Department of Computer Science
Eastern Michigan University
511 Pray-Harrold
Ypsilanti, Michigan 48197
734.487.1955
bkeller@emich.edu

EDUCATION:

Ph.D., Computer Science, Virginia Polytechnic Institute & State University, 1997
Dissertation: *Algorithms and Orders for Finding Noncommutative Gröbner Bases*

M.S., Computer Science, Virginia Polytechnic Institute & State University, 1990

B.S., Computer Science, Western Kentucky University, 1986

RESEARCH INTERESTS:

Translational bioinformatics, scientific software design, recommender systems, software engineering, symbolic computation, algebra and logic.

PROFESSIONAL EXPERIENCE:

2007–present *Associate Professor*, Department of Computer Science, Eastern Michigan University, Ypsilanti, Michigan.

2008–present *Visiting Scholar*, Center for Computational Medicine and Bioinformatics, University of Michigan, Ann Arbor, Michigan.

2004–2008 *Bioinformatics Program Coordinator*, College of Arts and Sciences, Eastern Michigan University, Ypsilanti, Michigan.

2006–2007 *Research Associate/Consultant*, National Center for Integrative Biomedical Informatics, University of Michigan, Ann Arbor, Michigan.

2002–2007 *Assistant Professor*, Department of Computer Science, Eastern Michigan University, Ypsilanti, Michigan.

1999–2002 *Visiting Assistant Professor*, Department of Computer Science, Virginia Tech, Blacksburg, Virginia.

- 1997–1999 *Assistant Professor*, Department of Computer Science, Montana Tech of the University of Montana, Butte, Montana.
- 1993–1995 *Instructor and Teaching Assistant*, Department of Computer Science, Virginia Polytechnic Institute & State University, Blacksburg, Virginia.
- 1991–1993 *Research Assistant*, Systems Research Center, Virginia Polytechnic Institute & State University, Blacksburg, Virginia.
Projects: *Cost Models for Complex Systems Engineering; Representation, Measurement and Evaluation in the Engineering of Complex Systems.*
- 1991 *Graduate Student Analyst*, University Research Foundation, University of Maryland; Naval Surface Warfare Center, Dahlgren Division, Dahlgren, Virginia.
- 1991 *Teaching Assistant*, Department of Computer Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- 1990 *Research Assistant*, Weeg Computing Center, University of Iowa, Iowa City, Iowa.
- 1988–1990 *Research Assistant*, Systems Research Center, Virginia Polytechnic Institute & State University, Blacksburg, Virginia.
Projects: *Development of an AEGIS Maintenance Methodology; Document Production and Analysis Under Next Generation Technologies; Extending Prolog to a Full Relational Database.*
- 1988 *Teaching Assistant*, Department of Computer Science, Virginia Polytechnic Institute & State University, Blacksburg, Virginia.
- 1986–1987 *Instructor of Computer Architecture and Systems Analysis*, Lindsey-Wilson College, Columbia, Kentucky.

JOURNAL PAPERS:*PUBLISHED*

“Identifying Hypothetical Genetic Influences on Complex Disease Phenotypes”, Benjamin J. Keller, Richard C. McEachin, *BMC Bioinformatics* **10**(Suppl 2) (5 February 2009) S13.

“Modeling gene-by-environment interaction in comorbid depression with alcohol use disorders via an integrated bioinformatics approach”, Richard C. McEachin, Benjamin J. Keller, Erika F.H. Saunders and Melvin G. McInnis, *BioData Mining* **1**, 2 (17 July 2008).

“Scouts, Promoters, and Connectors: The Roles of Ratings in Nearest-Neighbor Collaborative Filtering”, Bharath K. Mohan, Benjamin J. Keller, Naren Ramakrishnan, *ACM Transactions on the Web* **1**, 2 (August 2007), article number 8.

“Evaluating Recommendation Algorithms by Graph Analysis”, Batul J. Mirza, Benjamin J. Keller and Naren Ramakrishnan, *Journal of Intelligent Information Systems* **20**, 3 (March 2003), 131–160.

“Privacy Risks in Recommender Systems”, Naren Ramakrishnan, Benjamin J. Keller, Batul Mirza, Anath Grama, and George Karypis, *IEEE Internet Computing*, **5**, 6 (Nov-Dec 2001) 54–62.

“Abstraction refinement: A model of software evolution”, Benjamin J. Keller and Richard E. Nance, *Journal of Software Maintenance* **5** (1993) 123–145.

CONFERENCE PAPERS:

“Identifying Hypothetical Genetic Influences on Complex Disease Phenotypes”, Benjamin J. Keller, Richard C. McEachin, Richard M. Watanabe and Melvin G. McInnis, *Proceedings of the 2008 AMIA Summit on Translational Bioinformatics*, 2008, 51–55.

“Scouts, Promoters, and Connectors: The Roles of Ratings in Nearest Neighbor Collaborative Filtering”, M. Barath Kumar, Benjamin J. Keller, Naren Ramakrishnan, *Proceedings of the ACM Conference on Electronic Commerce (EC’06)*, 2006, 250–259.

“Alternatives in implementing noncommutative Gröbner basis systems”, Benjamin J. Keller, *Symbolic Rewriting Techniques*, M. Bronstein, J. Grabmeier, V. Weispfenning (eds.), Birkhauser-Verlag, 1998.

“Opal: A system for computing noncommutative Gröbner Bases”, Edward L. Green, Lenwood S. Heath, and Benjamin J. Keller, *RTA-97*, H. Comon (ed.), LNCS # 1232, Springer-Verlag, 1997.

“Abstraction Refinement Model: Perspectives on systems reengineering”, Benjamin J. Keller and Richard E. Nance, in *Proceedings of the 3rd Annual Systems Reengineering Technology Workshop*, Naval Surface Warfare Center, White Oak Detachment, 1992, 69–76.

AWARDS:

Provost’s Research Award for New Faculty, Eastern Michigan University, 2003.

FUNDING:

Prototyping Strategies for the Elucidation of Genetic Interactions in Complex Disease Etiology, Benjamin J. Keller, subcontract to NIH grant U54 DA021519-02-A1, National Center for Integrative Biomedical Informatics, PI: Brian Athey, University of Michigan. Renewed annually: May 2007–July 2007, August 2007–July 2008, August 2008–July 2009, August 2009–July 2010.

SLBM Transition to a Multi-Paradigm Software Support Environment, James D. Arthur, Richard E. Nance and Benjamin J. Keller, Funding for one year project from Naval Surface Warfare Center, Dahlgren Division, January 2002 – September 2002.

Transitioning the SLBM Software Process to Object-Oriented Development via Training, Benjamin J. Keller, Richard E. Nance and James D. Arthur, Funding for two-year project from Naval Surface Warfare Center, Dahlgren Division, May 2001 – August 2002.

A System for Computing Noncommutative Gröbner Bases, Benjamin J. Keller, Funding for one year through Montana NSF EPSCoR (MONTs), May 1998 – May 1999.

Big Sky Conference on Discrete Mathematics, Jennifer McNulty, P. Mark Kayll, Benjamin J. Keller, Erin R. Spicer, and Evan B. Wantland, Funding for three years through NSF program on Algebra and Number Theory, 1998-2000.

PRESENTATIONS:

“Identifying Hypothetical Genetic Influences in Complex Disease”, Richard C. McEachin, Benjamin J. Keller, Peter P. Zandi, Mohsen Almani, Melvin G. McInnis, selected presentation based on poster abstract, and poster presentation at INDY07 Bioinformatics Conference, Indianapolis, Indiana, June 2007.

“Goal-directed completion of noncommutative Gröbner bases”, Benjamin J. Keller, presentation at UNIF 2000 (unification workshop), Pittsburgh, Pennsylvania. June 2000.

“Computations in non-commutative algebra using Opal”, Benjamin J. Keller, presentation that the *Symbolic Computation: Solving Equations in Algebra, Geometry and Engineering*, part of the 2000 Joint Summer Research Conferences in the Mathematical Sciences, Mt Holyoke, South Hadley, Massachusetts. June 2000.

“Implementing Gröbner Basis Methods”, Benjamin J. Keller, tutorial at the *FLoC workshop on Gröbner Bases and Rewrite Systems*, Trento, Italy, July 1999.

“Indexing for Completion of String-Based Rewriting Systems”, Benjamin J. Keller, presentation at the *Big Sky Conference on Discrete Mathematics*, University of Montana, Missoula, Montana, September 1998.

“Implementation of Noncommutative Gröbner Basis Systems”, Benjamin J. Keller, invited talk, given to the AG Grundlagen der Informatik, Fachbereich Informatik, Universität Kaiserslautern, Kaiserslautern, Germany, February, 1998.

“Algorithms and Orders for the Computation of Noncommutative Gröbner Bases”, Benjamin J. Keller, poster at *Thirty Three Years of Gröbner Bases*, RISC-Linz, Linz, Austria, February, 1998.

“Spanning Tree Families and Admissible Orders on Paths”, Benjamin J. Keller, presentation at the *Big Sky Conference on Geometry, Discrete Mathematics and Algorithms*, University of Montana, Missoula, Montana, September 1997.

“The Opal System”, Benjamin J. Keller, presentation and demonstration at *22nd Holiday Symposium*, Las Cruces, New Mexico, January 1997.

“Experiments with Algorithms and Orders in the Computation of Noncommutative Gröbner Bases”, Benjamin J. Keller, poster at the *Second Magma Conference on Computational Algebra*, Marquette University, May 1996.

“Algorithmic Issues in Implementing a Noncommutative Gröbner Basis Package”, Benjamin J. Keller, presentation at the *Conference on Symbolic Rewriting Techniques*, Monte Verita, Ticino, Switzerland, May 1995.

“Algorithmic Issues in Implementing a Noncommutative Gröbner Basis Package”, Benjamin J. Keller, poster at *East Coast Computer Algebra Day '95*, University of Delaware, April 1995.

“A Cost Modeling Formalism for Reengineering Decisions”, Benjamin J. Keller, presentation at the *SEI Reengineering Workshop*, Pittsburgh, Pennsylvania, May 1994.

“Cost Models for Complex Systems Engineering: Status Report”, Benjamin J. Keller, Presentation to Virginia Tech Systems Research Center Advisory Board, Blacksburg, Virginia, February 1993.

REPORTS:

“SLBM OO Tutorial”, Benjamin J. Keller, Web-based tutorial and instructor’s manual, Systems Research Center, VPI&SU, 2002.

“Alternatives in implementing noncommutative Gröbner basis systems”, Benjamin J. Keller, Technical Report TR 96-07, Department of Computer Science, VPI&SU, 1996.

“The Cost Modeling Formalism for Complex Systems Engineering: Guidelines for Use”, Benjamin J. Keller and Richard E. Nance, Technical Report, Systems Research Center, VPI&SU, 1996.

“A Cost Modeling Formalism for Complex Systems Engineering”, Benjamin J. Keller and Richard E. Nance, Technical Report, Systems Research Center, VPI&SU, 1996.

“A Process Model Basis for Complex Systems Engineering Cost Models”, Benjamin J. Keller and Richard E. Nance, Technical Report SRC-94-004, Systems Research Center, VPI&SU, 1994.

“Cost Models for Complex Systems Engineering: Interim Report – Subtask 1”, Benjamin J. Keller and Richard E. Nance, Technical Report SRC-93-001, Systems Research Center, VPI&SU, 1993.

“The Abstraction Refinement Model and the Modification Cost Problem”, Benjamin J. Keller and Richard E. Nance, Technical Report SRC-92-002, Systems Research Center, VPI&SU, 1992.

“An Algebraic Model of Software Evolution”, Benjamin J. Keller, Masters Thesis, Department of Computer Science, VPI&SU, 1990 (directed by Richard E. Nance); Technical Report SRC-90-008, Systems Research Center, VPI&SU, 1990.

“Development of an AEGIS Maintenance Methodology, Task 2: Models of the AEGIS Maintenance Process”, Benjamin J. Keller, Richard E. Nance, and James D. Arthur, Technical Report SRC-90-006, Systems Research Center, VPI&SU, 1990.

“Requirements for a Software Maintenance Methodology”, Richard E. Nance, James D. Arthur, Benjamin J. Keller, Technical Report SRC-90-001, Systems Research Center (also TR CS-90-4, Department of Computer Science), VPI&SU, 1990.

“Documentation Production Under Next Generation Technologies”, Richard E. Nance, Benjamin J. Keller, and David Boldery, Technical Report SRC-89-001, Systems Research Center, VPI&SU, 1989.

PROFESSIONAL SERVICE:

CONFERENCE ORGANIZATION

Gröbner Bases and Rewrite Systems, Klaus Madlener, Susan Hermiller, Benjamin J. Keller, and Birgit Reinert, workshop at FLoC '99, Trento, Italy, June-July 1999.

Mathematics, Statistics and Computer Science Session, Montana Academy of Sciences Annual Meeting, Section Vice President and session organizer, Butte, Montana, April 1999.

Big Sky Conference on Discrete Mathematics, Jennifer McNulty, P. Mark Kayll, Benjamin J. Keller, Erin R. Spicer, and Evan B. Wantland, University of Montana, Missoula, Montana, September 1998.

UNIVERSITY SERVICE

Evaluation Committee Chair, Computer Science Department, Eastern Michigan University, 2007-2008.

University Realignment Taskforce, University level committee, Eastern Michigan University, 2005–2006.

Faculty Council Technical Advisory Committee, University level committee, Eastern Michigan University, 2004.

Bioinformatics Steering Committee, College level committee, Eastern Michigan University, 2003–2004.

Departmental Library Liason, Computer Science Department, Eastern Michigan University, 2002–2004.

Recognition and Awards Committee, Computer Science Department, Virginia Tech, 2001–2002.

Undergraduate Program Committee, Computer Science Department, Virginia Tech, 1999–2000.

Software Engineering Program Committee, College level committee, Montana Tech, 1998–1999. Developed proposal for B.S. program that was approved by Montana Board of Regents in spring 1999.

Committee on discretionary research funds, chaired by Vice Chancellor for Research and Graduate Studies, Montana Tech, 1998–1999.

Montana Tech CS faculty, 1997–1999. Participated in undergraduate curriculum development, computer resource decisions, and negotiations on cooperative graduate degree with University of Montana, Missoula.

WORKING GROUPS

SEI Reengineering Workshop, invited member of working group continuing work on the Joint Logistics Commanders Software Reengineering Assessment Handbook, Pittsburgh, Pennsylvania, May 1994.

Santa Barbara I, Workshop on Software Reengineering, invited member of Reengineering Economics Panel, which developed initial draft of the Joint Logistics Commanders Reengineering Economics Handbook (now called the Software Reengineering Assessment Handbook), Santa Barbara, California, September 1992.

3rd Annual Systems Reengineering Technology Workshop, invited member of committee on reengineering process, Naval Surface Warfare Center, White Oak Detachment, White Oak, Maryland August 1992.

NSWC Systems Reengineering Strategies Working Group, invited member, Naval Surface Warfare Center, White Oak Detachment, White Oak, Maryland May 1992.

REFEREE

Journal of Biomedical Informatics

ACM Transactions on Modeling and Computer Simulation

Journal of Algorithms

PROFESSIONAL ORGANIZATIONS:

American Medical Informatics Association

Association for Computing Machinery

ACM Special Interest Group on Automata and Computability Theory

ACM Special Interest Group on Computer Science Education

International Society for Computational Biology