

**Duane A. Bailey**  
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## Education

- Ph.D., *Computer and Information Science*,  
University of Massachusetts, Amherst, May 1988.  
Dissertation: *Specifying Communication for Massively Parallel Ensemble Machines*.
- M.S., *Computer and Information Science*,  
University of Massachusetts, Amherst, May 1984.  
Thesis: *On Ramsey Tautologies*.
- B.A., *Mathematics and Physics*,  
Amherst College, May 1982.  
Thesis: *On Subdirect Sums of Rings*. Elected to Sigma Xi.

## Honors and Awards

- Member ACM, IEEE, CRA, and AAAS.
- American Electronics Association Fellow, 1984–1987.
- Recipient of Freshman Walker Prize in Mathematics (First), Amherst College.

## Professional Experience

- *Professor and Chair of Computer Science*, Williams College. Appointed 1988.  
Member of a small, independent computer science department at a small, competitive liberal arts institution.
- *Visiting Scholar*, University of Texas, Spring 1992.  
On leave sponsored by the CODE research group of J. C. Browne.
- *Research Assistant*, University of Massachusetts, Fall 1982–Fall 1988.  
Research with Janice Cuny focused on specification of parallel systems, and performance of parallel algorithms and architectures.
- *Instructor*, University of Massachusetts, Summer 1983.  
Taught a course on software engineering and data structures.
- *Co-founder*, Rescon Associates, Inc., Salem, New Hampshire, 1983.  
An educational and technical consulting firm for the computer industry.
- *Software Engineer*, Digital Equipment Corporation, Nashua, New Hampshire, 1981–1982.  
Built performance analysis tools during summers (for VMS development group).

## Research Interests

- High performance programming environments, hardware, languages, and algorithm design; programming and code maintenance methodologies; aperiodic data structures; graph grammars and L-systems; algorithmic information theory; bioinformatics.

## Publications

- Duane A. Bailey, co-editor.  
Directory of the Undergraduate Mathematics and Computer Science Programs.  
Council on Undergraduate Research, 1995.
- Duane A. Bailey and Janice E. Cuny.  
Programming with very large graphs.  
In *Fourth International Workshop on Graph Grammars*.  
Springer-Verlag, Lecture Notes in Computer Science, 532:84–97, 1991.
- Duane A. Bailey, Janice E. Cuny and Craig P. Loomis.  
ParaGraph: graph editor support for parallel programming environments.  
*The International Journal of Parallel Programming*, August 1990.  
(Abstracted version appears as Technical Report 89–53, COINS Department,  
University of Massachusetts at Amherst, July 1989.)
- Duane A. Bailey and Janice E. Cuny.  
Visual extensions to parallel programming.  
In *Second Workshop on Languages and Compilers for Parallel Computing*,  
MIT Press, pp. 17–36, 1990.  
(Appears also as COINS Technical Report 89–69, August 1989.)
- Mark Gisi, Janice E. Cuny, and Duane A. Bailey.  
Canister communication as a vehicle for parallel debugging.  
In *Proceedings of the First Annual IEEE Symposium on  
Distributed and Parallel Processing*, pp. 198–199  
May 1989.
- Duane A. Bailey and Janice E. Cuny.  
Canister communication in parallel programs.  
Technical Report 88–42, COINS Department, University of Massachusetts at Amherst  
October 1988.
- Duane A. Bailey.  
Specifying Communication for Massively Parallel Ensemble Machines  
Ph.D. Dissertation, University of Massachusetts at Amherst,  
September 1988.  
(Appears also as COINS Technical Report 88–83, October 1988.)

- Duane A. Bailey, Janice E. Cuny, and Bruce B. MacLeod.  
Reducing communication overhead: a parallel code optimization.  
*Journal of Parallel and Distributed Computing*, pp. 505–520,  
October 1987.
- Janice E. Cuny, Duane A. Bailey, John W. Hagerman, and Alfred A. Hough.  
The simple simon programming environment: a status report  
In 25<sup>th</sup> *Allerton Conference on Communication, Control and Computing*, pp. 238–247,  
October 1987.  
(Appears also as COINS Technical Report 87–22, 1987.)
- Duane A. Bailey and Janice E. Cuny.  
Structural properties of communication structures generated by  
aggregate rewriting graph grammars.  
In 25<sup>th</sup> *Allerton Conference on Communication, Control and Computing*, pp. 1234–1240,  
October 1987.
- Duane A. Bailey and Janice E. Cuny.  
An approach to programming process interconnection structures: aggregate  
rewriting graph grammars.  
In *Parallel Architectures and Languages Europe*,  
Springer-Verlag, Lecture Notes in Computer Science, 259:112–123, 1987.  
(Appears also as COINS Technical Report 87–25.)
- Duane A. Bailey and Janice E. Cuny.  
Graph grammar based specification of interconnection structures for  
massively parallel computation.  
In *The Third International Workshop on Graph Grammars*,  
Springer-Verlag, Lecture Notes in Computer Science, 291:73–85, 1986.  
(Appears also as COINS Technical Report 87–23.)
- Duane A. Bailey and Janice E. Cuny.  
An efficient embedding of large trees in processor grids.  
In *1986 International Conference on Parallel Processing*, pp. 819–822,  
August 1986.
- Duane A. Bailey and Janice E. Cuny.  
The use of shape grammars in processor embeddings.  
COINS Technical Report A–86–23, University of Massachusetts at Amherst, July 1986.

## Books

- Duane A. Bailey.  
*Java Structures: Data Structures in Java for the Principled Programmer*, Chinese Language Edition, Second Edition, McGraw-Hill, 2004.
- Duane A. Bailey.  
*Java Structures: Data Structures in Java for the Principled Programmer*, Second Edition, McGraw-Hill, 2002.
- Duane A. Bailey. *Java Structures: Data Structures in Java for the Principled Programmer*, Korean Language Edition, McGraw-Hill, 2001.
- Duane A. Bailey. *Java Structures: Data Structures in Java for the Principled Programmer*, Chinese Language Edition, McGraw-Hill, 2000.
- Duane A. Bailey. *Java Structures: Data Structures in Java for the Principled Programmer*, McGraw-Hill, 1998.
- Duane A. Bailey and Duane W. Bailey. *Java Elements: Principles of Programming in Java*, McGraw-Hill, 2000.
- Duane A. Bailey and Duane W. Bailey. *Java Elements: Principles of Programming in Java*, Chinese Language Edition, McGraw-Hill, 2002.

## Seminars and Colloquia

- “Use of Computational Theories in Biology,” Quality Education for Minorities Workshop for Biology and Mathematics, Baltimore, April 2005.
- “Life as an Algorithm” in “Rethinking CS101: Engaging Students from the Arts and Sciences in Computer Science,” Computer Research Association, Snowbird, June 2005.
- “Use of Computational Theories in Biology,” Quality Education for Minorities Workshop for Biology and Mathematics, Atlanta, August 2005.
- “Cellular Life and Computation”  
Invited Sigma Xi talk, University of North Carolina, Greensboro, January 2005.  
Brown Bag Lunch, Williams College, February 2005.
- “Earning Cache”  
Bronfman Brown Bag Lunch, Williams College, Fall 2003.  
Department of Computer Science, Williams College, Spring 2003.
- “An (Almost) Universal Sponge Tile”  
Department of Mathematics, Williams College, Spring 2001.
- “Building Moving Empires”  
Consortium of Liberal Arts Colleges, Reed College, June 1999.

- “Building Empires”  
Bronfman Brown Bag Lunch, April 1999.
- “Aperiodic Data Structures”  
Department of Computer Science, Oberlin College, April 1998.
- “Aperiodic Data Structures”  
Department of Computer Science, Middlebury College, April 1998.
- “Algorithmic Strides through Aperiodic Tilings”  
Department of Mathematics, Bennington College, November, 1996.
- “Quasi-structured Computations”  
Bronfman Brown Bag Lunch, July 1995.
- “A Puzzling Model for Computation”  
Faculty Lecture Series, March 2, 1995.
- “How to Grow Massively Parallel Programs I”  
Sigma Xi Lectures, April 1994
- “How to Grow Massively Parallel Programs II”  
Sigma Xi Lectures, April 1994
- “Randomness in Algorithms: An Introduction”  
Department of Computer Science, May, 1993.
- “Managing Parallelism”  
Bronfman Brown Bag Lunch, February 14, 1993.
- “The Computer Virus”  
Department of Computer Science, December 4, 1992.
- “An Open Letter To Research Students”  
Invited lecture, National Meeting of the Council on Undergraduate Research,  
Hope College, June 1992.
- “Canister Communication”  
Department of Computer Science, University of Texas, Austin, May 1992.
- “WALT: Animator for the Masses”  
Bronfman Brown Bag Lunch Talk, Summer 1990.
- “Finding the Maximum of a Million Numbers”  
Gettysburg College, March 1990.
- Co-organizer of the *NECUSE Workshop on Parallel Processing*  
A workshop of the Northeast Consortium on Undergraduate Science Education,  
funded by the Pew Foundation.  
January 7–9, 1990, Amherst College.

- “A First Course in Parallel Programming”  
NECUSE Workshop on Parallel Programming, January 1990.
- “Some Simple Ways to Rewrite Graphs”  
Summer Mathematics Faculty Seminar, Summer 1989.
- “Aids for Programming 10,000 (or more...) Processors”  
Bronfman Science Center Lunch, Fall 1988.
- “Grammars We Never Told You About”  
Department of Computer Science, Williams College, Fall 1988.

### Honors Students

- Effinger-Dean, Laura, *The Empire Problem in Penrose Tilings*, May 2006.  
Currently at University of Washington.
- Hirshman, Brian, *Virtual Machines: Features and Futures*, May 2006.  
Currently at Carnegie Mellon University.
- Cyll, Topher, *Cache-Conscious Memory Management*, May 2004.  
Currently at Intel.
- Chen, Kai, *DNA-to-DNA Computation*, May 2004.  
Currently at Microsoft.
- Zhu, Feng, *Search for a Universal Tile*, May 2002.  
Currently at Harvard.
- Munson, Miles A., *Caching Strategies for the Java Virtual Machine*, May 2001.  
Currently at Cornell.
- Healy, Jason B., *Algorithms for Forcing*, May 2000.  
Currently at BiT Group.
- Chaffin, Benjamin C., *Exploring the Danzer Tiling*, May 1998.  
Currently at Intel.
- Minnick, Linden, *Generalized Forcing in Aperiodic Tilings*, May 1998.  
Currently at Intel.
- Bernheim, Alice J., *A Debugger-Friendly Distributed Tuple Space*, May 1996.  
NSF Fellow.  
Ph.D. (University of Washington)  
Currently at Microsoft Research.
- Trepte, Forrest, *Exploring Aperiodic Tilings with Inflation*, May 1996.  
Currently at Microsoft.

- McLaughry, Stephen, *TS++: Communication Specification using Path Expressions in the Tuple Space Programming Model*, May 1995.  
Currently in business in Ireland.
- Sandys, Sean D., *Support for Dynamic Itinerary-Based Communication*, May 1994.  
Ph.D. (University of Washington)
- Frank S. Grassia, *GraPPLe: A Graphical Parallel Programming Language*, May 1993.  
NSF and ARCS fellow.  
Ph.D. (Carnegie Mellon University). Currently at Pixar.
- Michael T. Cox, *Parallel Algorithm Animation*, May 1991.  
M.S. (Cornell University).
- Michael S. van Lent, *Parallel Genetic Algorithms*, May 1991.  
M.S. from University of Tennessee at Knoxville.  
Ph.D. (University of Michigan). Currently at Sony.

## Teaching Interests

- *Courses taught:*
  - The Art and Science of Computer Graphics,
  - Life as an Algorithm (Williams and Bennett)
  - Introduction to Computer Science,
  - C, Unix, and the Joy of X (Winter Study),
  - Data Structures (Offered in Pascal, Modula-2, C++, and Java)
  - Computer Organization,
  - Algorithms,
  - Operating Systems,
  - Modern Computer Architecture, and
  - Parallel Processing.
- *Other course interests:*
  - High Performance Architectures, VLSI Design, Instruction Level Parallelism,
  - Information Theory, and Parallel Complexity Theory.

## Professional Service

- NSF Reviewer (usually CCLI program).  
Summer 2000-present.
- Foundation for Excellence in Schools' Arthur Vining Davis Fellow.  
Working with Bolton Central School (Bolton Landing, NY), Theodore Roosevelt High School and the Academy for Environmental Sciences (both in New York City).  
Fall 2001-Spring 2003.

- Consortium on Computing at Small Colleges, Northeastern Conference.  
Panels, Tutorials, and Workshops Chair  
April 2001, Middlebury College.  
April 2004, Union College.
- Jack Kent Cooke Foundation.  
Review Committee.  
2002 through 2005.
- Barry M. Goldwater Scholarship and Excellence in Education Foundation (a Congressional foundation).  
Review Committee (Computer Science and Mathematics).  
February 1998 to present.
- Oberlin Honors Examination.  
Administrator for Computer Science.  
April 1998.  
Department Reviewer.  
January 2004.
- Council on Undergraduate Research.  
Vice Chairman of the Mathematics and Computer Science Division.  
Elected Spring 1993 to a three year term.

### College Service

- Honor and Discipline Committee, 2006-present, Chair.
- Honor and Discipline Committee, 2002-2004, Chair.
- Bioinformatics, Proteomics and Genomics Program Committee, 2003-present.
- Chair, Computer Science, 2000—2001, 2003-2005.
- Information Technology Committee, 1997—1998.
- The Honorary Degrees Committee, 1996—1998.
- The Academic Computer Committee, 1996-1997, Chair.
- Library Committee, 1994—1996 (Chair 1995—1996).
- Panel of Six, 1992—1994.
- The Committee on Educational Policy, 1990—1991.
- The Committee for Academic Computing, 1989—1990.