

Franklyn Turbak's Activities Sheets

Franklyn Turbak
Department of Computer Science
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Publications

Notes

- As is the custom in computer science, I list refereed conference and workshop papers as publications in addition to journal papers. For more explanation, see the *Evaluating Computer Science Research* section of my *Personal Statement*.
- Where known, I have included the acceptance rate of refereed conference and workshop papers, and the estimated “impact rating” of journals and conferences as reported by the NEC ResearchIndex engine (<http://citeseer.nj.nec.com/impact.html>). For further explanation of these numbers, see the *Evaluating Computer Science Research* section of my *Personal Statement*.
- Almost all my papers are co-authored with colleagues. My role in collaborative research is explained in my *Research Summary*. Papers that I not only co-authored but also presented at a conference are marked with ★.
- *ACM* stands for *Association for Computing Machinery*, a professional society for computer science. *LNCS* stands for *Lecture Notes in Computer Science*, a series published by Springer Verlag.

Journal Papers (published)

- 1987 Thomas Malone, Kenneth Grant, Franklyn Turbak, Stephen Brobst, and Michael Cohen. Intelligent Information-Sharing Systems. *Communications of the ACM*, May 1987. *Impact: top 27.38%*.
- 1999 ★ Franklyn Turbak, Constance Royden, Jennifer Stephan, and Jean Herbst. Teaching Recursion Before Iteration in CS1. *The Journal of Computing in Small Colleges* 14(4), May 1999. (This journal publishes proceedings of regional conferences of the Consortium for Computing in Small Colleges.)

Journal Papers (to appear)

- 2001 Patricia Johann and Franklyn Turbak. Lumberjack Summer Camp: A Cross-Institutional Undergraduate Research Experience in Computer Science. *Computer Science Education*. To appear in 11(4), Dec. 2001.
- 2002 J. B. Wells, Allyn Dimock, Robert Muller, and Franklyn Turbak. A Calculus for Polymorphic and Polyvariant Flow Types. *Journal of Functional Programming*. To appear in 2002. *Impact: top 9.20%*.
- 2002 Franklyn Turbak and Robert Berg. Robotic Design Studio: Exploring the Big Ideas of Engineering in a Liberal Arts Environment. *Journal of Science Education and Technology*. To appear in 2002.

Refereed Conference Papers

- 1986 Thomas Malone, Kenneth Grant, and Franklyn Turbak. The Information Lens: An Intelligent System for Information Sharing in Organizations. In *Proceedings of the ACM CHI'86 Conference Proceedings on Human Factors in Computing Systems*. Boston, MA, April 13–17. *Impact: top 11.88%*.
- 1988 ★ Roy Pea, Michael Eisenberg, and Franklyn Turbak. Creatures of Habit: A Computational System to Enhance and Illuminate the Development of Scientific Thinking. In *Program of the Tenth Annual Conference of the Cognitive Science Society*. Montreal, Canada, August 17–19. Proceedings published by Lawrence Erlbaum Associates, Hillsdale, NJ.
- 1996 ★ Franklyn Turbak. First-Class Synchronization Barriers. In *Proceedings of the 1996 ACM SIGPLAN International Conference on Functional Programming (ICFP '96)*. Philadelphia, PA, May 24–26. *Acceptance rate: 25/85 = 29%. Impact: top 10.02%*.
- 1997 J. B. Wells, Allyn Dimock, Robert Muller, and Franklyn Turbak. A Typed Intermediate Language for Flow-Directed Compilation. In *7th International Joint Conference on the Theory and Practice of Software Development (TAPSOFT '97)*. Lille, France, April 14–18. Published as *LNCS 1214*. *Acceptance rate: 23/79 = 29%*.
- 1997 Allyn Dimock, Robert Muller, Franklyn Turbak, and J. B. Wells. Strongly Typed Flow-Directed Representation Transformations. In *Proceedings of the 1997 International Conference on Functional Programming (ICFP '97)*. Amsterdam, The Netherlands, June 9–11. *Acceptance rate: 25/78 = 32%. Impact: top 10.02%*.
- 1999 ★ Assaf Kfoury, Harry Mairson, Franklyn Turbak, and J.B. Wells. Relating Typability and Expressiveness in Finite-Rank Intersection Type Systems. *Proceedings of the 1999 ACM SIGPLAN International Conference on Functional Programming (ICFP '99)*. Paris, France, September 27–29. *Acceptance rate: 25/81 = 31%. Impact: top 10.02%*.
- 2000 Torben Amtoft and Franklyn Turbak. Faithful Translations between Polyvariant Flows and Polymorphic Types. *Programming Languages and Systems: 9th European Symposium on Programming, ESOP 2000*. Berlin, Germany, March 25 - April 2. Published as *LNCS 1782*, Gert Smolka (Ed.) *Acceptance rate: 26/84 = 31%. Impact: top 13.40%*.
- 2000 Elena Machkasova and Franklyn Turbak. A Calculus for Link-Time Compilation. *Programming Languages and Systems: 9th European Symposium on Programming, ESOP 2000*. Berlin, Germany, March 25 - April 2. Published as *LNCS 1782*, Gert Smolka (Ed.) *Acceptance rate: 26/84 = 31%. Impact: top 13.40%*.
- 2001 Allyn Dimock, Ian Westmacott, Robert Muller, Franklyn Turbak, J. B. Wells. Functioning without Closure: Type-Safe Customized Function Representations for Standard ML. *Proceedings of the Sixth ACM SIGPLAN International Conference on Functional Programming (ICFP '01)*. Florence, Italy, September 3–5. *Acceptance rate: 23/66 = 35%. Impact: top 10.02%*.
- 2001 ★ Franklyn Turbak and J. B. Wells. Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. *Proceedings of the 3rd International Conference on Principles and Practice of Declarative Programming (PPDP'01)*. Florence, Italy, September 5–7. *Acceptance rate: 19/40 = 48%. Impact: top 66.89%*.

Refereed Workshop Papers

- 1987 Michael Eisenberg, Mitchel Resnick, and Franklyn Turbak. Understanding Procedures as Objects. In Gary M. Olson, Sylvia Sheppard, and Elliot Soloway, *Empirical Studies of Programmers: Second Workshop*. Washington, DC, December 7-8. Proceedings published by Ablex, Norwood, NJ. *Acceptance rate: 15/50 = 28%*.
- 2000 Allyn Dimock, Ian Westmacott, Robert Muller, Franklyn Turbak, J. B. Wells, and Jeffrey Considine. Program Representation Size in an Intermediate Language with Intersection and Union Types. *Third Workshop on Types in Compilation (TIC 2000)*. Montreal, Canada, September 21. Published as *LNCS 2071*, Robert Harper (Ed.) *Acceptance rate: 7/19 = 37%*.

Papers Presented at Professional Meetings, Lectures, Talks, Colloquia

In this section, I list unrefereed papers, technical reports, and thesis work in addition to talks.

Unrefereed Workshop Papers

- 1997 ★ Franklyn Turbak, Allyn Dimock, Robert Muller, and J. B. Wells. Compiling with Polymorphic and Polyvariant Flow Types. *ACM SIGPLAN Workshop on Types in Compilation (TIC '97)*. Amsterdam, The Netherlands, June 8. Proceedings published as Boston College Computer Science Department Technical Report BCCS-97-03.
- 2001 ★ Franklyn Turbak and Robert Berg, Robotic Design Studio: Exploring the Big Ideas of Engineering in a Liberal Arts Environment. *American Association for Artificial Intelligence (AAAI) Spring Symposium on Robotics and Education*. Stanford University, March 26-28. To be published as a AAAI technical report. (This is an extended abstract that evolved into our *Journal of Science Education and Technology* paper.)

Technical Reports

- 2001 Allyn Dimock, Ian Westmacott, Robert Muller, Franklyn Turbak, J. B. Wells, and Jeffrey Considine. Program Representation Size in an Intermediate Language with Intersection and Union Types. Boston University Technical Report BUCS-TR-2001-02, July. (This is a version of our TIC 2000 paper with an appendix describing the Church Intermediate Language (CIL).)

Thesis Work

- 1986 Franklyn Turbak. *Grasp: A Visible and Manipulable Model for Procedural Programs*. S.M. Thesis, Massachusetts Institute of Technology, May. Advisors: Andrea diSessa and D. Austin Henderson.
- 1994 Franklyn Turbak. *Slivers: Computational Modularity via Synchronized Lazy Aggregates*. Ph.D. Dissertation, Massachusetts Institute of Technology, January. Advisors: Gerald J. Sussman and David K. Gifford.

Talks

- 1984 Grasp: A Visible and Manipulable Model for Procedural Programs. Talk and demonstration at Xerox Palo Alto Research Center, December.
- 1986 Grasp: A Visible and Manipulable Model for Procedural Programs. Talk to Education in Math, Science, and Technology group at University of California at Berkeley, July.
- 1987 Understanding Procedures as Objects. MIT AI Laboratory Colloquium, December 2.
- 1994 Slivers: Computational Modularity via Synchronized Lazy Aggregates. Open MIT Ph.D. defense, January 7.
- 1994 Microworlds Meet MUDs. Talk given at ARPA Workshop on MUDs and Schools, Dedham, MA, December 14.
- 1998 Hands-on Robotics. Computer Science Colloquium talk and demonstration, University of Hartford, March 24.
- 1998 Hands-on Robotics. After-school talk, Loomis-Chaffee School, Windsor Locks, CT, March 24.
- 1998 How to Teach Java in CS1 (panelist). Consortium for Computing in Small Colleges Third Annual Northeastern Conference (CCSCNE-98). Sacred Heart University, April 24.
- 1998 Towards Better Deforestation Techniques. Middlebury College Computer Science Department, October 27.
- 1998 Towards Better Deforestation Techniques. Bates College Computer Science Department, November 12.
- 1998 All You Need is Lambda. Bates College Computer Science Department, November 13.
- 2000 Glass-Box Simulations of Complex Phenomena. Wellesley Science Center Summer Research Program Seminar, July 21.
- 2001 Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. New England Programming Languages Seminar, SUN Microsystems, Burlington, MA, October 5. (In preparation.)

Research In Progress

Books (in preparation)

- 1988-2001 Franklyn Turbak and David Gifford with Brian Reistad, *Applied Semantics of Programming Languages*. Book in preparation based on course notes for MIT's graduate programming languages course (6.821).

Journal Papers (in preparation)

- 1999-2001 Assaf Kfoury, Harry Mairson, Franklyn Turbak, and J.B. Wells. Relating Typability and Expressiveness in Finite-Rank Intersection Type Systems. Expanded version of ICFP'99 paper in preparation for journal submission.
- 2000-1 Torben Amtoft and Franklyn Turbak. Faithful Translations between Polyvariant Flows and Polymorphic Types. Expanded version of ESOP'00 paper in preparation for journal submission.
- 2000-1 Franklyn Turbak and J. B. Wells. Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. Expanded version of PPDP'01 paper in preparation for journal submission.

Technical Reports (in preparation)

- 2000-1 Elena Machkasova and Franklyn Turbak. A Computationally Sound Call-By-Value Module Calculus. Boston University technical report that expands on our ESOP'00 paper. When completed, the technical report will serve as the basis for two journal publications: one on our novel technique for proving computational soundness, and the other on our three-level call-by-value module calculus.

Ongoing Research

- 1995-2001 In collaboration with Prof. Bob Muller (Boston College), Dr. Joe Wells (Heriot-Watt University), Allyn Dimock (Harvard University) and Ian Westmacott (Boston University), I continue work involving the extension of, and experimentation with, a compiler based on flow types. Our current focus is comparing syntactic and flow-based inlining techniques, and investigating flow-based approaches to uncurrying and tuple flattening.
- 1999-2001 In collaboration with Prof. Patty Johann (Dickinson College), Kirsten Chevalier '01 (now a CS graduate student at Berkeley), Nausheen Eusuf '02, and Julie Weber '03, I am continuing work on empirically evaluating existing program deforestation techniques and developing new techniques.

Research Grants From Any Source Inside Or Outside the College

External Grants

- 1996-1998 National Science Foundation Instrumentation and Laboratory Improvement Grant DUE 9650969 (with Robbie Berg): *Robot-Based Explorations in a Liberal Arts Environment*. \$7500 (+ \$7500 in matching funds from Wellesley).
- 1998-2001 National Science Foundation Software Engineering and Languages Grant CCR-9804053: *Predictable Deforestation: A Type-Based Approach to Eliminating Virtual Aggregates*. \$50,637.
- 1998-2002 National Science Foundation Experimental Software Systems Grant EIA-9806747: *Collaborative Research: Applications of Flow Types in the Efficient, Modular, and Reliable Compilation of Higher-Order Typed Languages*. \$93,626. (Part of a \$979,794 multi-institution grant with Boston College, Boston University, and Stevens Institute of Technology.)

Internal Grants

- 1995 Educational Research and Development Instructional Technology Grant (with Robbie Berg): *A Robot Design Course for Wintersession*. \$2500.
- 1996-1998 Hughes Grant (with Robbie Berg): Support for *Robotic Design Studio* course. \$11,000.
- 1997 Hughes Curriculum Development Grant (with Robbie Berg): *Student-Assisted Curriculum Development of a Robotic Design Studio*. \$2500.
- 2000 Faculty Awards Scholarly Activity Grant: *Student Research on Deforestation*. \$3000.
- 2000 Educational Research and Development Pedagogy Improvement Grant: *Code Warrior Development for CS111*. \$1000.
- 2000 Educational Research and Development Pedagogy Improvement Grant (with Robbie Berg): *Robot Design Studio Museum*. \$800.

Special Honors and Awards

- 1979 Rensselaer Polytechnic Institute Science Medal. (Award to high-school juniors for excellence in the sciences.)
- 1980 ITT Rayonier Scholarship.
- 1986 Carleton E. Tucker Award. (MIT Electrical Engineering and Computer Science (EECS) department teaching award.)
- 1986 Instructorship-G Award. (Special teaching rank awarded by MIT EECS department for recognition of excellence in teaching.)
- 1990 Goodwin Medal, 1990. (MIT institute-wide graduate student teaching award for “conspicuously effective teaching”.)
- 1993 Elected member of Sigma Xi.
- 2001 Pinanski Prize. (Wellesley College faculty teaching award.)

Membership, Activities, Offices Held in Professional Societies

- 1990-2001 Association for Computing Machinery, member.
1995-2001 Consortium for Computing in Small Colleges, member.

Other Professional Activities

Graduate Student Mentorship

- 1994 Raymie Stata. Member of MIT Area Exam committee. Raymie's paper: *Two Approaches to Subtyping in Object-Oriented Languages*, May 13.
1995 David Espinosa. External reader for Columbia University doctoral dissertation: *Semantic Lego*, May.
1999 Santiago Pericas-Geersten. Reader for Boston University master's thesis: *Type Inference with Recursive Types and Object Types*, May.
1996-2001 Elena Machkasova. Advisor for Boston University doctoral dissertation, expected Fall 2001.

Conference/Workshop/Panel Organization

- 1995 Local coordinator for Forum on Parallel Computing Curricula. Wellesley College, March 31–April 1.
1997 Vendors chair for the Consortium for Computing in Small Colleges. Second Annual Northeastern Conference (CCSCNE-97). Northeastern University, April 25–26.
1997 Leader (with Robbie Berg) of a two-day NECUSE-sponsored *Robotic Design Studio* workshop. Colby College, October 24-25.
1998 Organizer and leader (with Robbie Berg) of a three-hour robotics workshop at the Consortium for Computing in Small Colleges Third Annual Northeastern Conference (CCSCNE-98). Sacred Heart University, April 24.
1998 Organizer (with Michael Berman) for *How to Teach Java in CS1* panel at the Consortium for Computing in Small Colleges Third Annual Northeastern Conference (CCSCNE-98). Sacred Heart University, April 24.
2000 Program committee member for Types in Compilation Workshop (TIC 2000).

Professional Development

Acronyms used below:

- AAAI American Association for Artificial Intelligence
CCSCNE Consortium for Computing in Small Colleges Northeastern Conference
FICS Fixed Points in Computer Science (workshop)
FOOL Foundations of Object-Oriented Languages (workshop)
ICFP International Conference on Functional Programming
NECUSE New England Consortium for Undergraduate Science Education
NEPLS New England Programming Language Seminar
NJPLS New Jersey Programming Language Seminar
PEPM Partial Evaluation and Program Manipulation (workshop)
PLDI Programming Language Design and Implementation (conference)
POPL Principles of Programming Languages (conference)
PPDP Principles and Practice of Declarative Programming (conference)
SAIG Semantics, Applications, and Implementation of Program Generation (workshop)
TIC Types in Compilation (workshop)

- 1987 Empirical Study of Programmers: Second Workshop. Washington DC, December 7-8.
- 1988 Tenth Annual Conference of the Cognitive Science Society. Montreal, Canada, August 17-19.
- 1994 MUSE Summit (Using Multi-User Simulation Environments in Education). Phoenix, AZ, March 9 – 11.
- 1994 Directions and Implications of Advanced Computing Symposium (DIAC '94). Cambridge, MA, April 23–24.
- 1994 ARPA/CSTO High-Performance Computing Software PI Meeting. Albuquerque, NM, May 10–12.
- 1994 Workshop on Learning about Evolution. MIT, July 9.
- 1994 ARPA Workshop on MUDs and Schools. Dedham, MA, December 14.
- 1995 NECUSE Workshop on Introductory Courses on Computer Science. Harvard University, January 28–29.
- 1996 POPL'96. St. Petersburg Beach, FL, January 21–24.
- 1996 CCSCNE-96. University of Hartford, April 19–20.
- 1996 Workshop on Using Java in the Computer Science Curriculum. Brown University. May 4.
- 1996 ICFP'96. Philadelphia, PA, May 23–26.
- 1996 Second International Summer School on Advanced Functional Programming. Olympia, WA. August 26-30.
- 1997 CCSCNE-97. Northeastern University, April 25–26.
- 1997 ICFP'97, Haskell Workshop, TIC'97. Amsterdam, The Netherlands, June 7–11.
- 1998 POPL'98, FOOL 5. San Diego, CA, January 17–21.
- 1998 CCSCNE-98. Sacred Heart University, April 24-25.
- 1998 ICFP'98, ML Workshop. Baltimore, MD, September 26–29.
- 1999 POPL'99. PEPM'99. San Antonio, TX, January 20–23.
- 1999 Web Security Seminar. Greater Boston Chapter of the ACM, MIT, April 17.
- 1999 CCSCNE-99. Providence College, April 23-24.
- 1999 PLDI'99. Atlanta, GA, May 1–4.
- 1999 NJPLS. NEC Research Institute, September 1.
- 1999 ICFP'99, PPDP'99. Paris, France, September 27–October 1.
- 2000 POPL'00, PEPM'00. Boston, MA, January 19–22.
- 2000 ICFP'00, PPDP'00, Haskell Workshop, TIC 2000. Montreal, Canada, September 16–22.
- 2000 NEPLS. Brown University, December 7.
- 2001 NEPLS. Boston University, February 20.
- 2001 AAAI Spring Symposium on Robotics and Education. Stanford University, March 26–27.
- 2001 NEPLS. Williams College, May 29.
- 2001 ICFP'01, PPDP'01, SAIG'01, FICS'01, Haskell Workshop. Florence, Italy, September 2–7.

Membership on Committees In The College, Special Departmental Committees, and Other Services to the College

Abbreviations: S = Spring, F = Fall.

Committees

- S95 Science Center Summer Research Selection Committee.
- F96–S98 Committee on Minority Recruitment, Hiring, and Retention, Group C representative. Played a major role in designing, implementing, and evaluating college-wide faculty questionnaires soliciting missing data on minority and non-minority faculty “trajectories” since the mid 1980s.
- F99–now Committee on Educational Research and Development, Group C representative. Responsible for reviewing grant applications for curricular development.
- F99–now Hughes Curriculum Development Award Committee, ER&D liaison.

College Service

- F95-S96 First-year advisor for Cazenove dormitory team.
- S96 First-year advisor orientation, panelist. May 21.
- F97-S98 First-year advisor for three students.
- F99-S00 First-year advisor for six students.
- S00 Mellon Interviews on Faculty Life Cycle, tenure-track interviewee.
- S00 Reflexive photography exercise for the planning of new campus center, faculty participant (with Liz Varon and Nancy Genero).
- F00 LTC shop talk on deadlines and extensions, panelist. November 15.
- F01 Story Time Study Breaks, Beebe, May 2.

Departmental Service

- F95–now Coach for Wellesley’s programming team in the annual ACM programming contest and CCSCNE-01 programming contest.
- F95–now Occasional but substantial system administration activities involving department’s Unix/Linux workstations.
- F95–S98 Department library liaison.
- S00–F00 Led “first wave” of effort to switch Java implementation from Symantec Cafe to Code Warrior in CS111.
- F00–now Information czar. Post CS-related news articles and information on CS internships and jobs. Currently in charge of revamping department web pages.