

FRANKLYN ALBIN TURBAK

Curriculum Vita

April 03, 2016

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Degrees

Ph.D. (Computer Science) Feb. 1994, M.I.T.
S.M. (Computer Science) May 1986, M.I.T.
S.B. (Computer Science, Electrical Engineering) May 1986, M.I.T.

Experience

Wellesley College, Department of Computer Science.
Associate Professor, Sep. 2002 – present;
Department Chair, Sep. 2002 – 2005;
Assistant Professor, Jan. 1995 – Aug. 2002.
MIT CSAIL, Visiting Scientist, Sep. 2013 – Aug. 2014.
Boston University, Computer Science Department. Visiting Research Associate. 1996 – 2013.
Oregon Graduate Institute, Pacific Software Research Center. Visiting Research Scientist.
Summer 1999.
MIT EECS Department, Programming Systems Research Group. Postdoctoral Associate.
1994.
MIT Laboratory for Computer Science. Developed course notes for MIT's graduate programming languages course (with David K. Gifford and Jonathan Rees). Summers 1989 – 1991.
NYU. Educational Technologies Laboratory. Designer and implementer for *Creatures of Habit* project (with Michael Eisenberg and Roy Pea). Summer 1988.
MIT Artificial Intelligence Laboratory and Laboratory for Computer Science. Research assistant in computer science. Member of the Mathematics and Computation Group (led by Harold Abelson and Gerald Jay Sussman) and the Programming Systems Research Group (led by David K. Gifford). 1987 – 1993.
MIT Sloan School of Management. Programmer for *Lens* project (with Kenneth Grant under the supervision of Thomas Malone). Summer 1985.
Xerox Palo Alto Research Center. Summer intern. Advisers: D. Austin Henderson, Daniel H. H. Ingalls, Tom Moran. 1982-1984, 1986.

Honors and Awards

- Choice Outstanding Academic Title, 2009. (Designation given to *Design Concepts in Programming Languages* – a designation given to only about 10% of reviewed books and only nine Computer Science books in 2009.)
- Pinanski Prize, 2001. (Wellesley College faculty teaching award.)
- Sigma Xi, 1993.
- Goodwin Medal, 1990. (MIT institute-wide graduate student teaching award for “conspicuously effective teaching”.)
- Instructorship-G Award, 1986. (Special teaching rank awarded by MIT EECS Dept. for recognition of excellence in teaching.)
- Carleton E. Tucker Award, 1986. (MIT EECS teaching award.)
- ITT Rayonier Scholarship, 1980.
- Rensselaer Polytechnic Institute Science Medal, 1979.

Grants

- National Science Foundation Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics grant DUE-1226216, 9/1/2012–8/31/2016. *Collaborative Research: Computational Thinking through Mobile Computing*. Amount: \$173,859. (Part of a \$565,836 multi-institution grant with MIT, Trinity College, UMass Lowell, and University of San Francisco.)
- National Science Foundation Experimental Software Systems Grant EIA-9806747, 8/15/98–8/14/02. *Collaborative Research: Applications of Flow Types in the Efficient, Modular, and Reliable Compilation of Higher-Order Typed Languages*. Amount: \$93,626. (Part of a \$979,794 multi-institution grant with Boston College, Boston University, and Stevens Institute of Technology.)
- National Science Foundation Software Engineering and Languages Grant CCR-9804053, 9/1/98–8/31/01. *Predictable Deforestation: A Type-Based Approach to Eliminating Virtual Aggregates*. Amount: \$50,637.
- National Science Foundation Instrumentation and Laboratory Improvement Grant DUE 9650969 (with Robbie Berg), 1996–1998. *Robot-Based Explorations in a Liberal Arts Environment*. Amount: \$7500 (+ \$7500 in matching funds from Wellesley).

Publications

Book

- Franklyn Turbak and David Gifford with Mark Sheldon. *Design Concepts in Programming Languages*. MIT Press, Aug. 2008.

Journal Papers/Notes

- Karishma Chadha and Franklyn Turbak. Improving App Inventor Usability via Conversion between Blocks and Text (Journal note). *Journal of Visual Languages & Computing*. Volume 25, Issue 6, Dec 2014, Pp. 1042–1043.
- Franklyn Turbak, Mark Sherman, Fred Martin, David Wolber, and Shaileen Crawford Pokress. Events-First Programming in App Inventor. *Journal of Computing Sciences in Colleges*. Volume 29, Issue 6, June 2014. Pp. 81–89.

Journal Papers/Notes (continued)

- 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* 11(3):237-253, Sep. 2002.
- J. B. Wells, Allyn Dimock, Robert Muller, and Franklyn Turbak. A Calculus for Polymorphic and Polyvariant Flow Types. *Journal of Functional Programming* 12(3): 183-227, May, 2002.
- Patricia Johann and Franklyn Turbak, Lumberjack Summer Camp: A Cross-Institutional Undergraduate Research Experience in Computer Science, *Computer Science Education* 11(4), Dec. 2001.
- 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.
- Thomas Malone, Kenneth Grant, Franklyn Turbak, Stephen Brobst, and Michael Cohen. Intelligent Information-Sharing Systems. *Communications of the ACM*, May 1987.

Refereed Conference/Workshop Papers

- Soojin Kim and Franklyn Turbak. Adapting Higher-order List Operators for Blocks Programming. *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VLHCC 2015)*, Atlanta, Georgia, Oct 19-21, 2015.
- Jeffrey Schiller, Franklyn Turbak, Hal Abelson, Jos Dominguez, Andrew McKinney, Johanna Okerlund, and Mark Friedman. Live Programming of Mobile Apps in App Inventor. *Proceedings of the 2nd Workshop on Programming for Mobile and Touch (PROMOTO '14)*, Portland, Oregon, Oct. 20, 2014.
- Franklyn Turbak, David Wolber, and Paul Medlock-Walton. The Design of Naming Features in App Inventor 2. *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VLHCC 2014)*, Melbourne, Australia, July 30–Aug 1, 2014.
- Franklyn Turbak, Smaranda Sandu, Olivia Kotsopoulos, Emily Erdman, Erin Davis, and Karishma Chadha. Blocks Languages for Creating Tangible Artifacts. *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing*. Innsbruck, Austria, October 1–3, 2012.
- Mark Sheldon and Franklyn Turbak. An Aspect-oriented Approach to the Undergraduate Programming Language Curriculum. *SIGPLAN Programming Language Curriculum Workshop*, May, 2008.
- Franklyn Turbak and J. B. Wells. Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. *Third International Conference on Principles and Practice of Declarative Programming*. ACM, 2001.
- Allyn Dimock, Ian Westmacott, Robert Muller, Franklyn Turbak, J. B. Wells. Functioning without Closure: Type-Safe Customized Function Representations for Standard ML. *International Conference on Functional Programming (ICFP '01)*. ACM, 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. *Third Workshop on Types in Compilation (TIC'2000)*, Published as *Lecture Notes in Computer Science 2071*, Robert Harper (Ed.)
- Elena Machkasova and Franklyn Turbak. A Calculus for Link-Time Compilation. *Programming Languages and Systems: 9th European Symposium on Programming, ESOP 2000*. Published as *Lecture Notes in Computer Science 1782*, Gert Smolka (Ed.)

Refereed Conference/Workshop Papers (continued)

- Torben Amtoft and Franklyn Turbak. Faithful Translations between Polyvariant Flows and Polymorphic Types. *Programming Languages and Systems: 9th European Symposium on Programming, ESOP 2000*. Published as *Lecture Notes in Computer Science 1782*, Gert Smolka (Ed.)
- Assaf Kfoury, Harry Mairson, Franklyn Turbak, and J.B. Wells. Relating Typability and Expressiveness in Finite-Rank Intersection Type Systems. *International Conference on Functional Programming (ICFP '99)*. ACM, 1999.
- Allyn Dimock, Robert Muller, Franklyn Turbak, and J. B. Wells. Strongly Typed Flow-Directed Representation Transformations. In *International Conference on Functional Programming (ICFP '97)*. ACM, 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)*. Springer Verlag Lecture Notes in Computer Science, 1997.
- Franklyn Turbak. First-Class Synchronization Barriers. In *Proceedings of the International Conference on Functional Programming (ICFP '96)*. ACM, 1996.
- Roy Pea, Michael Eisenberg, and Franklyn Turbak. Creatures of Habit: A Computational System to Enhance and Illuminate the Development of Scientific Thinking. In *Tenth Annual Conference of the Cognitive Science Society*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1988.
- 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*. Norwood, New Jersey: Ablex, 1987.
- Thomas Malone, Kenneth Grant, and Franklyn Turbak. The Information Lens: An Intelligent System for Information Sharing in Organizations. In *Proceedings of the CHI'86 Human Factors in Computing Conference*. ACM, 1986.

Unrefereed Workshop Papers

- Franklyn Turbak and Robert Berg, Robotic Design Studio: Exploring the Big Ideas of Engineering in a Liberal Arts Environment. *AAAI Spring Symposium on Robotics and Education*, Stanford University, 26-28 Mar. 2001.
- 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)*, Jun. 1997.

Technical Reports

- 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, Jul. 2001. (A version of the TIC'00 paper with an appendix describing the CIL intermediate language.)
- Torben Amtoft and Franklyn Turbak. Faithful Translations between Polyvariant Flows and Polymorphic Types. Boston University Technical Report BUCS-TR-2000-01, Fall 2000. (A version of the ESOP'00 paper with technical details fleshed out.)

Theses

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

Presentations

Invited Talks

- Taking Stock of Blocks: Promises and Challenges of Blocks Programming Languages. Keynote talk at the *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2015)*. Atlanta, GA. Oct 21, 2015.
- Democratizing Programming with Blocks Languages. Keynote talk at the *21st International Conference on Distributed Multimedia Systems (DMS 2015)*. Vancouver, Canada. Aug 31, 2015.
- Not Just for Novices: the Design and Implementation of Blocks Programming in MIT App Inventor. Invited Computer Science Seminar talk given at Williams College, October 24, 2014.
- Mobile Computational Thinking in App Inventor 2. Invited talk given to the Computer Science Teachers Association of Rhode Island (CSTA-RI) at Rhode Island College. Apr 10, 2014..
- All You Need is Lambda. Invited classroom talk. Bates College Computer Science Department, Nov. 13, 1998.
- Towards Better Deforestation Techniques. Invited talk. Bates College Computer Science Department, Nov. 12, 1998.
- Towards Better Deforestation Techniques. Invited talk. Middlebury College Computer Science Department, Oct. 27, 1998.

Refereed Conference/Workshop/Seminar Talks

- The Design of Naming Features in App Inventor 2. Paper presented at the *IEEE Symposium on Visual Languages and Human-Centric Computing (VLHCC 2014)*, Melbourne, Australia, July 30–Aug 1, 2014.
- Events-First Programming in App Inventor. Paper presented at the *19th Annual Conference of the Northeast region of the Consortium for Computing Sciences in Colleges (CCSCNE '14)*. Providence College, Apr 25, 2014.
- Blocks Languages for Creating Tangible Artifacts. Paper presented at the *IEEE Symposium on Visual Languages and Human-Centric Computing*, Innsbruck, Austria, Oct. 2, 2012.
- Blocks Languages for Creating Tangible Artifacts. Talk given at the New England Programming Languages and System Symposium (NEPLS). University of Southern Maine, Portland, Jun. 1, 2012.
- Building Bridges to Engineering. Presentation of Wellesley engineering activities (with Ted Ducas, Robbie Berg, Gill Pratt, and Brian Storey). *3rd Annual Symposium on Engineering and Liberal Education*, Union College, Jun. 5, 2010.

Refereed Conference/Workshop/Seminar Talks (continued)

- Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. New England Programming Languages Seminar (NEPLS). SUN Microsystems, Burlington, MA, Oct. 5, 2001.
- Cycle Therapy: A Prescription for Fold and Unfold on Regular Trees. Paper presented at the *Third International Conference on Principles and Practice of Declarative Programming*, Florence, Italy. Sep. 7, 2001.
- Teaching Recursion Before Iteration in CS1. Paper presented at the *Consortium for Computing in Small Colleges Northeastern Conference (CCSCNE-99)*, Providence, Rhode Island. May 23, 1999.
- Relating Typability and Expressiveness in Finite-Rank Intersection Type Systems. Paper presented at the *International Conference on Functional Programming*, Paris, France. Sep, 27, 1999.
- Compiling with Polymorphic and Polyvariant Flow Types. Paper presented at the *Types in Compilation Workshop*. Amsterdam, The Netherlands. 8 June 1997.
- First-class Synchronization Barriers. Paper presented at the *International Conference on Functional Programming*. Philadelphia, PA. May 25, 1996.
- Creatures of Habit. Paper presented at the *Tenth Annual Conference of the Cognitive Science Society*. Montreal, Quebec, Canada. Aug. 18, 1988.

Refereed Conference Panels

- Usability of Programming Languages. Special Interest Group (SIG) proposal for *ACM Conference on Computer Human Interaction (CHI2016)*, prepared with Brad A. Myers, Andreas Steffik, Stefan Hanenberg, Antti-Juhani Kaijanaho, Margaret Burnett, and Philip Wadler. Accepted for presentation in San Jose, CA, on May 10, 2016.
- App Inventor Breakfast. Organized and led discussion at breakfast meeting featuring PIs and workshop participants from my NSF TUES *Computational Thinking Through Mobile Computing* grant. *46th ACM Technical Symposium on Computer Science Education (SIGCSE 2015)*. Kansas City, MO. Mar. 7, 2015.
- Using App Inventor in Introductory CS Courses. Organized panel and served as moderator with panelists Meimei Gao, Julie Johnson, Dale Reed, and Cate Sheller. *46th ACM Technical Symposium on Computer Science Education (SIGCSE 2015)*. Kansas City, MO. Mar. 6, 2015.
- Lessons learned from teaching App Inventor. Organized panel and served as panelist with Hal Abelson, Ralph Morelli, Eni Mustafaraj, and Chinma Uche. *Consortium for Computing Sciences in Colleges Northeastern Conference (CCSCNE 2012)*. Quinnipiac University. Apr. 27, 2012.
- How to teach Java in CS1. Panel organizer (with Michael Berman) and panelist. *Consortium for Computing in Small Colleges Third Annual Northeastern Conference (CCSCNE-98)*. Sacred Heart University. Apr. 24, 1998.

Refereed Conference Workshops

- Build apps with MIT App Inventor. Organized and co-led three-hour workshop with Stephen Zanotti. *The International Society for Technology in Education Conference (ISTE 2014)*. Atlanta, GA. Jun 29, 2014.
- Mobile Computational Thinking with App Inventor 2. Organized and co-led three-hour workshop with Josh Sheldon and Mark Sherman. *19th Annual Conference of the Northeast region of the Consortium for Computing Sciences in Colleges (CCSCNE 2014)*. Providence College. Apr. 25, 2014.
- Mobile Computational Thinking with App Inventor 2. Organized and co-led three-hour workshop with Fred Martin, Shaileen Crawford Pokress, Ralph Morelli, Mark Sherman, and David Wolber. *45th ACM Technical Symposium on Computer Science Education (SIGCSE 2014)*, Atlanta, GA. Mar 7, 2014
- Teaching the CS Principles Curriculum with App Inventor. Co-led three-hour workshop with Ralph Morelli, Shaileen Pokress, David Wolber, and Fred Martin. *44th ACM Technical Symposium on Computer Science Education (SIGCSE 2013)*, Denver, CO, Mar. 8, 2013.
- Teaching CS0 with Mobile Apps using App Inventor for Android. Organized three-hour workshop, and co-led it with Hal Abelson, Ralph Morelli, Eni Mustafaraj, and Stella Kakavouli. *17th Annual Consortium for Computing Sciences in Colleges Northeastern Conference (CCSCNE 2012)*. Quinnipiac University. Apr. 27, 2012.
- Teaching CS0 With Mobile Apps Using App Inventor For Android. Organized three-hour workshop, and co-led it with Ralph Morelli and Eni Mustafaraj. *27th Annual Consortium for Computing Sciences in Colleges Eastern Conference (CCSCE 2011)*. Marymount University. Oct. 15, 2011.
- Mobile Phone Apps in CS0 using App Inventor for Android. Organized three-hour workshop and co-led it with Hal Abelson, Mark Chang, and Eni Mustafaraj. *15th Annual Conference of the Northeast region of the Consortium for Computing Sciences in Colleges (CCSCNE 2010)*. University of Hartford. Apr. 16, 2010.
- Creating Mobile Phone Applications with App Inventor for Android. Co-led three-hour workshop with Ellen Spertus, Hal Abelson, and Jill Dimond. *41st ACM Technical Symposium on Computer Science Education (SIGCSE 2010)*, Milwaukee, WI. Mar. 12, 2010.

Refereed Conference Posters

- A Preliminary Analysis of App Inventor Blocks Programs. Presented poster with Johanna Okerlund. *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2013)*. San Jose, CA. Sep 17, 2013.
- Naming Features in App Inventor 2. Presented poster created with David Wolber and Paul Medlock-Walton. *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2014)*. Melbourne, Australia. Jul 30, 2014.
- Improving App Inventor Usability via Conversion between Blocks and Text. Presented poster created with Karishma Chadha. *20th International Conference on Distributed Multimedia Systems (DMS 2014)*. Pittsburgh, PA. Aug. 28, 2014.

Other Talks/Panels

- Member of panel on The Future of Visual Languages and Sentient Systems (with Gennaro Costagliola, Paolo Nesi, and Gem Stapleton). *21st International Conference on Distributed Multimedia Systems (DMS 2015)*, Vancouver, Canada. Sep 1, 2015.
- Improving Blocks Programming in App Inventor. Wellesley College Science Center Summer Research talk. Jun. 18, 2015.
- App Inventor and Computational Thinking. Wellesley College Science Center Summer Research talk. Jun. 13, 2014.
- Member of App Inventor education panel (with Shay Pokress, David Wolber, Mark Sherman, and Fred Martin). App Inventor Summit at MIT. July 18, 2013.
- Visual Programming Languages (panelist in panel with John Maloney, Paul Medlock-Walton, Daniel Wendel, and Wolfgang Slany). App Inventor Summit at MIT. July 17, 2013.
- Improving App Inventor and Other Blocks Languages. Wellesley College Science Center Summer Research talk. Jun. 14, 2013.
- Panelist for Wellesley Pforzheimer Learning and Teaching Center panel, *Pedagogical Lessons from the Albright Institute*. Mar. 14, 2013.
- Building a Better World: The Case for Engineering in the Liberal Arts. Albright Institute talk and hands-on engineering activity (with Amy Banzaert and Robbie Berg). Jan. 8, 2013.
- Building Better Blocks Programming Languages. Wellesley College Science Center Summer Research talk. Jun. 8, 2012.
- Panelist for Wellesley Pforzheimer Learning and Teaching Center panel, *Flipping the Classroom and Beyond: Using technology to teach outside the classroom*. Feb. 15, 2012.
- Building a Better World: The Case for Engineering in the Liberal Arts. Albright Institute talk and hands-on engineering activity (with Robbie Berg). Jan. 4, 2012.
- Panelist for Wellesley Pforzheimer Learning and Teaching Center panel, *Using Google Apps for Teaching*, Oct. 12, 2011.
- Rapid Prototyping for Everyone! Making Personal Fabrication more Accessible. Wellesley College Science Center Summer Research talk. Jun. 21, 2011. Research Directions in Block-based Programming Languages. Wellesley College Science Center Summer Research talk. Jun. 1, 2010.
- Two Views of Programming Languages: Mechanical vs. Linguistic. Wellesley College Science Center Faculty Seminar. Apr. 8, 2010.
- Robotic Design Studio. Wellesley College alumnae talk and workshop (with Robbie Berg). Jun. 6, 2008.
- Glass-Box Simulations of Complex Phenomena. Wellesley Science Center Summer Seminar. Jul. 21, 2001.
- Hands-on Robotics. After-school talk. Loomis-Chaffee School, Windsor Locks, CT, Mar. 24, 1998.
- Hands-on Robotics. Computer Science Colloquium talk and demonstration. University of Hartford, Mar. 24, 1998.
- Robotics Workshop. Three-hour workshop (led with Robbie Berg). *Consortium for Computing in Small Colleges Third Annual Northeastern Conference (CCSCNE-98)*. Sacred Heart University. Apr. 24, 1998
- Robotic Design Studio Workshop. Two-day NECUSE-sponsored workshop (led with Robbie Berg). Colby College. Oct. 24-25, 1997
- Microworlds Meet MUDs. Talk given at *ARPA Workshop on MUDs and Schools*. Dedham, MA. Dec. 14, 1994.

Other Talks/Panels (continued)

- Slivers: Computational Modularity via Synchronized Lazy Aggregates. Open MIT PhD defense. Jan. 7, 1994.
- Understanding Procedures as Objects. MIT AI Laboratory Colloquium. Dec. 2, 1987.
- Grasp: A Visible and Manipulable Model for Procedural Programs. Invited talk for Education in Math, Science, and Technology group at University of California at Berkeley. Jul. 1986.
- Grasp: A Visible and Manipulable Model for Procedural Programs. Talk and demonstration at Xerox Palo Alto Research Center. Dec. 1984.

Editorial Positions

- Co-editor in chief (one of four) of the *Journal of Visual Languages and Sentient Systems* (<http://ksiresearchorg.ipage.com/vlss/>), founded in 2015.
- Associate editor of the *Journal of Visual Languages and Computation* since Jun. 2013.

Conference/Workshop Organization and Committees

- Chaired the organizing committee and program committee for *Blocks and Beyond*, a full-day satellite workshop of VL/HCC 2015 focusing on the design of and research on blocks programming languages. Over 50 attendees. Also edited the proceedings, which were published in the IEEE Xplore digital library. Workshop held Oct. 22, 2015 in Atlanta. Work done Apr-Nov. 2015.
- Program committee member for the IEEE Symposium on Visual Languages and Human Centric Computing (VL/HCC 2015). Atlanta, GA, Oct. 19 – 21, 2015.
- Workshop Chair for the International Workshop on Visual Languages and Computing (VLC 2015), held as part of the 21st International Conference on Distributed Multimedia Systems. Vancouver, BC, Canada, Aug. 31 – Sep. 2, 2015.
- Program Chair for the International Workshop on Visual Languages and Computing (VLC 2014), held as part of the 20th International Conference on Distributed Multimedia Systems. Pittsburgh, PA, Aug. 31 – Sep. 2, 2014.
- Wellesley representative for creating the New England Undergraduate Computing Symposium (NEUCS), an annual celebration of undergraduate CS work. Helped to organize the first annual NEUCS at Wellesley. Spring, 2009.
- Workshops Chair for the International Conference for Functional Programming held in Snowbird, Utah, Sep. 18-22, 2004.
- Program committee member for Types in Compilation Workshop (TIC 2000).
- Vendors chair for the Consortium for Computing in Small Colleges Second Annual Northeastern Conference (CCSCNE-97). Northeastern University. Apr. 25 – 26, 1997.
- Local coordinator for Forum on Parallel Computing Curricula. Wellesley College. Mar. 31 – Apr. 1, 1995.

External Review Committees

- Member of external review committee for the Math and Computer Science Department at University of San Diego (with Paul Zeitz and Erica Flapan). Nov.17–18, 2011.
- External evaluator of Computer Science teachers at Philips Exeter Academy. May 22, 26, 27, 2009.
- Member of external review committee for the Computer Science Department at Hamilton College (with Henry Walker and Debra Burhans). Apr. 8–10, 2009.
- Member of external review committee for the Computer Science Department at the University of San Francisco (with Andrea Danyluk and Mehran Sahami). Apr. 9–11, 2008.

Outreach

Presented App Inventor tutorial to middle and high school girls as part of MIT Technovation HackDay. Jan 25, 2014.

Taught MIT SPLASH 3-hour course *Learn to Program Your Own Apps with App Inventor!* to 15 high school students (with Josh Sheldon, Paul Medlock-Walton, and Joanie Weaver). Nov 23, 2014.

Led *Hour of Code* laser cutting activity in the Wellesley Science Center. Dec. 12, 2013.

Cryptography activities for Codman Academy visits to Wellesley College: Jan. 22, 2010 (with Scott Anderson), Dec. 5, 2008, Nov. 2, 2007 (with Daniel Bilar), Mar. 2, 2007.

Taught *Cricket Club* after-school mini-course (based on PicoCricket and Scratch) at Sheehan elementary school, Westwood MA. Spring, 2009.

Led after-school Lego/LOGO course for elementary school students in Stoneham, MA. Fall 1990.

Other Activities

As a member of App Inventor development team since 2012, led several projects, including

- the redesign and implementation of variables in the browser-based blocks editor;
- new psuedo-higher-order list operator blocks;
- conversion between blocks code and text code;
- improved debugging mechanisms;
- converter from App Inventor Classic projects to App Inventor 2 projects;
- automatic project upgrading mechanism;
- speeding up the loading of large projects.

Hosted four Wellesley teams at distributed Boston-area BALGORFEST programming event.

Three Wellesley teams placed in the top four spots (including first place). Apr 04, 2016.

Participated in one-day *Summit on Blocks Language Accessibility for the Blind and Visually Impaired* at MIT and wrote meeting notes shared with the other participants. Apr 26, 2015.

Mentor for Northeastern graduate course CS 6510 Advanced Software Development, Spring 2015. The topic this semester was modifying App Inventor to create web apps rather than Android mobile apps. Met in person or online with projects groups once a week.

Hosted the Boston Area Preliminary (BOSPRE) programming contest at Wellesley (with Scott Anderson). Oct 18 2014.

Participated in App Inventor Summit. Co-led (with Josh Sheldon) pre-summit 4-hour workshop on MIT App Inventor, Personal Mobile Computing, and Education. Jul 16–18, 2014.

In July 2015 and June 2014, organized and co-led two 3-day NSF-funded workshops on Computational Thinking through Mobile Computing (with Fred Martin, Ralph Morelli, Eni Mustafaraj, Shay Pokress, Josh Sheldon, Mark Sherman, and Dave Wolber). Taught about 20 faculty participants each summer how to use App Inventor to teach mobile computational thinking ideas. About half incorporated App Inventor into one of their courses.

Attended Scratch Big Data Summit at MIT. Mar 21, 2014.

Hosted the Boston Area Preliminary (BOSPRE) programming contest at Wellesley (with Scott Anderson). Oct 19, 2013

Other Activities (continued)

- Attended and advised five final projects in MIT course *6.S198 Making Mobile Apps* while on sabbatical at MIT. Fall 2013.
- Co-led (with Fred Martin and Mihaela Sabin) 3-day CS4HS App Inventor Workshop for 38 high school and middle school teachers. Jul 24-26, 2013
- Participated in MIT App Inventor summit, Jul 17–18, 2013. Participated in two panels and led a "deep dive" on App Inventor blocks language design.
- Participated in MIT block languages workshop, Jan. 9, 2013.
- Participated in MIT App Inventor summit, Jul 13–14, 2012.
- Supervised the development of the Tanner Mobile App, Summer 2012.
- Organized *D-Lab at Wellesley* meeting, in which new engineering hire Amy Banzaert and MIT D-Lab founder Amy Smith met with Wellesley faculty and administrators to discuss engineering opportunities at Wellesley. Jun. 6, 2012.
- Read from Kevin Kelley's *What Technology Wants* as part of What Wellesley's Reading program (<http://www.wellesley.edu/wwr/>), Feb. 29, 2012.
- Participated in MIT block languages workshop, Jan. 20, 2012.
- Participated in MIT App Inventor summit, Oct. 2, 2011.
- Helped to organize and assist with the running of a hands-on engineering learning activity led by Wilson lecturer Amy Smith, the founder of MIT's D-Lab. Sep. 27, 2012.
- Demonstrated Scratch boards at Scratch Day, MIT Media Lab, May 19, 2011.
- Led Wellesley participation in the creation of the *App Inventor Community Gallery* website (with UMass Lowell and University of San Francisco), 2011.
- Exhibited engineering puppet projects with EXT160 students at Mini-Maker Faire, Cambridge, MA, May 7, 2011.
- Implemented Wellesley College Tanner Conference photo contest submission and judging web sites, Sep–Oct., 2010.
- Demonstrated Scratch boards at *Sensing the World with the Scratch Sensor Board*, workshop at Scratch@MIT conference, Aug. 11, 2010.
- Led the *Tanner Technology Initiative*, an effort to develop technology to improve the experience of Wellesley College Tanner Conference presenters and attendees. Secured funding for and supervised three Wellesley students and one Olin student to work on the project. Jun.–Oct., 2010.
- Hosted Boston App Inventor meeting at Wellesley, Sep. 2, 2009.
- Participated in App Inventor educational pilot program workshop, Google, Jun. 8–10, 2009.
- Hosted Boston Area Preliminary for the ACM programming contest (BOSPPE) at Wellesley College (together with Scott Anderson). Oct. 2003, Oct. 2004, Oct. 2009, Oct. 2010.
- Coached Wellesley's ACM programming contest team. 1995–2004 and 2006–2011.
- Led effort to institute the *Cirque du CS*, a biannual celebration of student projects in the Wellesley CS dept., Spring 2005.
- Designed and implemented *Haymarket* rule-based systems exhibit (with Mitchel Resnick) at Boston Computer Museum. 1987.

Teaching

Wellesley College (Feb. 1995–present). Courses taught (S=Spring, F=Fall, W=Wintersession, Sum=Summer):

- *CS110 Computer Science and the Internet*: S15, S10, S09, S08
- *CS111 Introduction to Programming and Problem Solving* (I led the development of the Java version of this course (Fall 1997– Spring 2013) and contributed to the development of the Python version (Fall 2014 onward): F15, S15, S13, S12 (two sections), S11 (two sections), F07, F06, Sum03, S03, S02, S00, F99, S98, F97 (two sections).
- *CS115 Robotic Design Studio* (I developed and taught this course with Robbie Berg): W09, W07, W05, W02, W01, W00, W99, W98, W97, W96.
- *CS117 Inventing Mobile Apps* (I developed this course): F15, F14, F11
- *CS118 Creative Computing* (I developed this pilot course for CS111-in-Python with Sohie Lee): S13
- *CS230 Data Structures*: S07, F04, S04, F02, F99, S98, S97, S96, F95, S95
- *CS231 Fundamental Algorithms*: F01, S01, F96, F95
- *CS235 Languages and Automata* (I introduced Forlan and parsing activities into this course): F12, F11, F10, F09, F08, F07
- *CS242 Computer Networks*: F09
- *CS251 Programming Languages* (I modified this course to use an interpreter-based approach): S16, S08, S07, S05, S04, S02, S01, S00, S97, S96, S95
- *CS301 Compiler Construction*: F03, F00, F96
- *CS342 Computer Security* (I developed this course): S16, F14, F12, F10 (with help from Hess Fellow Tyler Moore), F08, F06 (with Hess Fellow Daniel Bilar)
- *CS349 Advanced Topics in Computer: Computer Security*: F04, F02
- *EXTD160 Introduction to Engineering*: S13 (assisted Amy Banzaert), S11 (with Amon Milner (Olin) and Chris Rogers (Tufts), S10 (with Robbie Berg)

MIT EECS Department. Gave four lectures in graduate programming languages course. Fall 1994.

Hewlett Packard, Palo Alto, CA. Invited to lead two-week version of SICP course. June, 1992.

Hogeschool Utrecht, The Netherlands. Invited to lead one-week version of SICP course. October 1991.

MIT Summer Program. Teaching assistant for two-week version of SICP presented to professors and professional engineers. Summers 1987 – 1991.

MIT Lincoln Laboratory, lab assistant for accelerated version of MIT’s SICP course. October 1985.

MIT EECS Department. Seven terms of teaching experience as recitation instructor and teaching assistant, 1984 – 1992. Courses taught include Programming Languages (a graduate core course), Structure and Interpretation of Computer Programs (SICP, an undergraduate core course), and Signals and Systems.

Graduate Student Mentorship

- Reader for Derrell Lipman’s UMass Lowell Doctoral Dissertation: *LearnCS! A browser-based research platform for CS1 and studying the role of instruction of debugging from early in the course*, Dec. 2014.
- Reader for Denping Zhu’s Boston University Doctoral Dissertation: *To Memory Safety Through Proofs*. May, 2006.
- Reader for Chiyen Chen’s Boston University Doctoral Dissertation: *Type Inference in Applied Type System*. Jul., 2005.
- External reader for Sonia Fagorzi’s University of Genova Doctoral Dissertation: *Module Calculi for Dynamic Reconfiguration*. May, 2005.
- Adviser for Elena Machkasova’s Boston University Doctoral Dissertation: *A Computationally Sound Call-by-value Module Calculus*. Spring 2002. Advised 1996–2002.
- Reader for Santiago Pericas-Geersten’s Boston University Master’s Thesis: *Type Inference with Recursive Types and Object Types*. May, 1999.
- External reader for David Espinosa’s Columbia University Doctoral Dissertation: *Semantic Lego*. May, 1995.

Graduate Examinations

- Member of Boston University CS oral exam committee for Mark Reynolds. Jan. 12, 2010.
- Member of Boston University CS oral exam committee for Andrei Lapets. Dec. 15, 2007.
- Member of Boston University CS oral exam committee for Likai Lui. Jan. 22, 2007.
- Member of Boston University CS oral exam committees for Kevin Donnelly, Joe Hallett, and Rui Shi. Dec., 2005.
- Member of Raymie Stata’s MIT area exam committee. Raymie’s paper: *Two Approaches to Subtyping in Object-Oriented Languages*. May 13, 1994.

Undergraduate Students Advised

- Maja Svanberg, Fall 2015–Spring 2016. Analyzed structure of App Inventor programs to determine which ones closely resemble tutorials.
- Devid Farinelli (University of Bologna), Summer 2015. Debugged and improved Xixi “Shirley” Lu’s folder feature in App Inventor as part of Google Summer of Code project.
- Jaqueline Young, Summer 2015. Worked on a zooming feature for App Inventor Presented poster on work at Wellesley Science Center Summer Research poster session (Jul 2015) and will also present at CCSCNE’16.
- Cece Tsui, Summer 2015. Worked on a blocks search feature for App Inventor. Presented poster on work at Wellesley Science Center Summer Research poster session (Jul 2015) and will also present at CCSCNE’16.
- Emery Gerndt Otopalik, Spring – Summer 2015. Improved App Inventor debugging mechanisms. Presented posters on work at Wellesley Science Center Summer Research poster session (Jul 2015).
- Soojin Kim, Fall 2013–Spring 2014. *Developing and Assessing New List Operators In App Inventor*. Wellesley senior honors thesis, May 2015. In Apr 2015, presented work in CCSCNE’15 poster and Wellesley Ruhlman talk. Presented paper on this work at the *IEEE Symposium on Visual Languages and Human-Centric Computing (VLHCC 2015)*, Atlanta, GA, Oct. 21, 2015.

Undergraduate Students Advised (continued)

- Xixi “Shirley” Lu., Fall 2013–Spring 2014. *Folders: A Visual Organization System for MIT App Inventor*. Wellesley senior honors thesis, May 2015. In Apr 2015, presented work in CCSCNE’15 poster and Wellesley Ruhlman talk.
- Sara Burns, Summer 2014. *Towards a Concept Map of App Inventor for Introductory Computer Science*. Work done as part of NSF TUES grant. Presented posters on work at App Inventor Summit (Jul 2015), Wellesley Science Center Summer Research poster session (Aug 2014), and CCSCNE (Apr 2015).
- Karina Chan, Summer 2014. Developed App Inventor Educators website, a site for educators to discuss teaching experiences and share resources (with Emily Ruff at MIT). Work done as part of NSF TUES grant. Presented posters on work at App Inventor Summit (Jul 2015) and Wellesley Science Center Summer Research poster session (Aug 2014),
- Cali Stenson, Spring 2014. *Comparing App Inventor 2 and App Inventor Classic Based on User Data*. Work done as part of NSF TUES grant. Presented poster on work at 2014 Grace Hopper Conference.
- Soojin Kim, Fall 2013–Spring 2014. *Adding New List Operators to App Inventor*. Work done in MIT course 6.S198 *Making Mobile Apps* in Fall, 2013 and continued at Wellesley in Spring, 2014. Presented poster on work at CCSCNE (Apr. 2014).
- Johanna Okerlund, Fall 2013–Spring 2014. *Improving App Inventor Debugging Support*. Wellesley senior honors thesis, May 2014. In Apr 2014, presented work in CCSCNE’14 poster and Wellesley Ruhlman talk.
- Karishma Chadha, Fall 2013–Spring 2014. *Improving the Usability of App Inventor through Conversion between Blocks and Text*. Wellesley senior honors thesis, May 2014. In Apr 2014, presented work in CCSCNE’14 poster and Wellesley Ruhlman talk.
- Xixi “Shirley” Lu, Summer 2013. Extended Blockly to handle new expression blocks shapes required in App Inventor. Presented posters of work at Wellesley Science Center Summer Research poster session (Aug 2013) and Wellesley Ruhlman Conference (Apr 2014).
- Bhargavi Ramanathan, Summer 2013. Extended Ralph Morelli’s Quizly system for creating App Inventor quizzes. Presented posters of work at Wellesley Science Center Summer Research poster session (Aug 2013) and CCSCNE (Apr 2014).
- Johanna Okerlund, Summer 2013. Analyzed runtime error information from App Inventor being developed. Presented poster of work at Wellesley Science Center Summer Research poster session (Aug 2013).
- Victoria Brown, Summer 2013. Improved Ralph Morelli’s backpack mechanism for copying blocks between App Inventor screens and projects. Presented poster of work at Wellesley Science Center Summer Research poster session (Aug 2013).
- Johanna Okerlund. *Collecting and visualizing usage data in App Inventor*. Continuation of Summer 2012 research project. Spring, 2013
- Sachi Shah. CS250 Independent Study project: *Software Development in Python*, Spring 2013.
- Suhyoun (Essie) Yu. CS250H Independent Study project: *SolidWorks Design*. Fall 2012.
- Violeta Ilieava (Princeton). *Adding support for files and maps in App Inventor*. Remotely supervised as part of Google Summer of Code project, Summer 2012.
- Annie Tuan and Sonali Sastry. Project to implement a web-based mobile app for Tanner scheduling. Summer 2012.
- Erin Davis and Karishma Chadha. *Converting between blocks and text in App Inventor*. Summer research project, 2012.

Undergraduate Students Advised (continued)

- Emily Erdman. *OAuth support for picture uploading in App Inventor*. Summer research project, 2012.
- Johanna Okerlund. *Collecting and visualizing usage data in App Inventor*. Summer research project, 2012.
- Erin Davis and Johanna Okerlund. Improvements to block programming. Part of Faculty-awards-supported *TinkerBlocks* project. Spring, 2012.
- Emily Erdman and Karishma Chadha. Improvements to block programming. Part of Faculty-awards-supported *TinkerBlocks* project. Jan. & Spring, 2012.
- Marie Vasek, Wellesley senior honors thesis: *Expressive Types for Block Programming Languages*. 2011–12 academic year.
- Smaranda Sandu and Olivia Kotsopoulos. PictureBlocks programming environment. Part of Faculty-Awards-supported project: *Accessible Programming Environments for Rapid Prototyping Tools*. 2011–12 academic year.
- Mary Benn. Adviser for comment system implementation project for App Inventor Community Gallery. Summer 2011.
- Nora McKinnell and Olivia Kotsopoulos. (Co-adviser with Scott Anderson) Project to improve *Tandora*, a web-based conference attendance scheduler. Summer 2011.
- Smaranda Sandu and Nichole Burton. Wellesley Science Center Summer Research internship: *Rapid Prototyping for Everyone!*, Summer 2011.
- Smaranda Sandu. TurtleBlocks programming environment. Part of Faculty-Awards-supported project: *Accessible Programming Environments for Rapid Prototyping Tools*. Spring, 2011.
- Alex Olivier. (Co-adviser with Robbie Berg, Physics.) Wellesley Pamela Daniels Fellowship Project, *Social Synapses*, a technology/art installation in the Wellesley Science Center atrium. 2010–11 academic year.
- Alex Olivier. (Co-adviser with Robbie Berg, Physics.) Wellesley senior honors thesis: *PicoBees: A New Toolkit for Creating Interactive Spaces*. 2010–11 academic year.
- Sam Kim. ERD-supported project: *Extending Forlan with Nondeterministic Pushdown Automata*. Fall, 2010.
- Chelsea Hoover. ERD-supported project: *Extending Forlan with Nondeterministic Pushdown Automata*. Spring and Fall, 2010.
- Jacob Getto, Caroline Sun, Heidi J. Wang, and Colette Whitaker. Tanner Technology projects: *Tandora* (a web-based Tanner conference scheduling program); *Photo Stream* (a photo display program for a large interactive tabletop surface); *World Map* (a display of Tanner Conference presenters for a large interactive tabletop surface); and a 3'x5' homemade interactive touch surface. June – October, 2010
- Andrea Johnston. Extradepartmental reader for Wellesley senior honor thesis: *Implementation, Analysis and Improvement of an Integer Programming Method for the Combinatorial Design of de novo Drug Cocktails with Application to HIV Reverse Transcriptase*. May, 2009.
- Edward Stumpf. CS250H independent study project: *ALFI: Animatronic Lego Face for Interaction*. Spring 2009.
- Paola Boettner, Catherine Lopez, and Lili Shi. CS350H independent study project: *Mobile Device Programming*. Spring 2009.
- Catherine Lopez. CS350 independent study project: *Security Visualization*. Spring 2009.
- Ayla Solomon. Wellesley senior honors thesis: *Administrative Role-Based Access Control for Linux*. 2008–09 academic year.

Undergraduate Students Advised (continued)

- Mimosa Burr. Extradepartmental reader for Wellesley senior honor thesis: *Marine Anti-fouling Agents*. May, 2007.
- Rebecca Shapiro. Committee member for Wellesley senior honors thesis: *Cooperative and Democratic System Management*. 2006–07 academic year.
- Vasumathi Raman. Committee member for Wellesley senior honors thesis: *Learning Primitive Predicates for Probabilistic Planning*. 2006–07 academic year.
- Sarah Shiplett and Ayla Solomon. CS250H independent study project: *Perseus: A Fire-Fighting Robot*. Spring 2007.
- Yuan Niu. CS350 independent study project: *Electronic Voting*. 2004–05 academic year.
- Vivian Chang, Amy Jeffries, and Anita Yip. CS250H independent study project: *Grendel: A Fire-Fighting Robot*. Spring 2005.
- Agnes Chang, Oana Ivan, and Susan Tse. CS250H independent study project: *Yellow Submarine: A Fire-Fighting Robot*. Spring 2005.
- Jue Wang. Wellesley senior honors thesis: *The Efficient Generation of Random Programs and their Applications*. 2003–04 academic year.
- Emily Carlin. CS250 independent study project: *Undeleting Files in Linux*. Spring, 2003.
- Betsy Masiello. (Co-adviser with Maud Chaplin, Philosophy.) Wellesley senior honors Thesis: *Privacy Implications of Biometric Surveillance: The Destruction of Anonymity*. 2002–03 academic year.
- Nausheen Eusuf. CS250 independent study project: *Exploiting Laziness: A Functional Approach to Finite Automata*. Spring 2002.
- Julie Weber. Wellesley summer research project and CS350 independent study project: *A Demodulizer for Haskell*. Spring 2001 – Summer 2002
- Laura Hwang. CS350 independent study project: *An ACM Programming Problem Archive*. Spring 2001.
- Yukari Wada. CS350 independent study project: *Cross-language Comparison of Data Structures*. Spring 2001.
- Kirsten Chevalier, Wellesley senior honors thesis: *Exploring the Type Inference Approach to Deforestation*. 2000–01 academic year.
- Kirsten Chevalier, Nausheen Eusuf, Kate Golder, Holly Muenchow, P. Chris Staecker (Bates) and Aaron Wheeler (Bates). (Co-supervisor with Patty Johann, Bates College) Undergraduate summer research experience: *Lumberjack Summer Camp*. Summer 2000.
- Erika Symmonds. (Co-adviser with Robbie Berg, Physics) CS250H independent study project: *BandeBot: A Fire-Fighting Robot*. Spring 2000.
- Lisa Hazel and Merideth Shotwell. (Co-adviser with Robbie Berg, Physics) CS350 independent study project: *A Fire-Fighting Robot*. Spring 2000.
- Emily Horton. CS350 independent study project: *Extensions to LogoBlocks, A Visual Programming Language*. Spring 2000.
- Ann Hintzman. CS350 independent study project: *Popeye: The Design and Implementation of a Fire-Seeking Robot*. Spring 1999.
- Yan Zhang. Wellesley senior honors thesis: *Experiments with Shortcut Deforestation*. 1998–99 academic year.
- Cynthia Jones. CS350 independent study project: *Databases*. Spring, 1997.
- Yan Zhang. Wellesley summer research project: *Visual Term Rewriting*. Summer 1997.
- Elena Konstantinova. CS350 independent study project: *Term Rewriting*.
- Anna Mitelman. Wellesley senior honors thesis: *Visual Graph Abstraction*. 1996–97 academic year.

Undergraduate Students Advised (continued)

Laura Diao. Wellesley summer research project: *Visual Robot Programming*. Summer 1996.

Crystal Ellsworth. CS350 independent study project: *Databases*. Spring, 1996.

Ruth Chuang. (Co-adviser with Robbie Berg, Physics) Wellesley senior project: *LEGO Robot Projects: An Innovative Way of Learning Science and Technology*. 1995–96 academic year.

Ramona Filipi. (Co-adviser with Matthew Merzbacher, CS) Wellesley senior project: *Cooperative Query Answering on Musical Data*. 1995–96 academic year.

Daniel Winship. MIT Undergraduate Research Opportunities Program project: *MUSEME: A Scheme-based Multi-User Simulation Environment*. Summer 1994.

Michael B. Parker. MIT bachelor's thesis: *Memoized Evaluation as the basis for a Stateless Programming Language*. Spring 1989.