Jean Yang

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Research interests

Programming language design, software verification, and security. My research focuses on designing and implementing language constructs that automate program concerns effectively and efficiently.

Education

2010–present **Ph.D. computer science**, *Massachusetts Institute of Technology*, Cambridge, MA, USA.
Advisor: Armando Solar-Lezama. Thesis: "A Framework for Automatically Enforcing Information Flow Policies."

2008–2010 **M.S. computer science**, *Massachusetts Institute of Technology*, Cambridge, MA, USA.
Advisor: Armando Solar-Lezama. Thesis: "Specification-Enhanced Programming."

2004–2008 **A.B. computer science**, *Harvard University*, Cambridge, MA, USA.
Graduated *Magna Cum Laude*. Senior thesis advised by Greg Morrisett.

Publications

Nikhil Swamy, Juan Chen, Cédric Fournet, Pierre-Yves Strub, Karthikeyan Bhargavan, and **Jean Yang**. Secure Distributed Programming with Value-Dependent Types. *Journal of Functional Programming 23(4) (JFP)*, July 2013.

Thomas H. Austin, **Jean Yang**, Cormac Flanagan, and Armando Solar-Lezama. Faceted Execution of Policy-Agnostic Programs. *Programming Languages and Security (PLAS)* 2013.

Jean Yang, Kuat Yessenov, and Armando Solar-Lezama. A Language for Automatically Enforcing Privacy Policies. *Principles of Programming Languages (POPL)* 2012.

Jean Yang and Chris Hawblitzel. Safe to the Last Instruction: Automated Verification of a Type-Safe Operating System. *Communications of the Association for Computing Machinery (CACM)*, December 2011.

Nikhil Swamy, Juan Chen, Cédric Fournet, Pierre-Yves Strub, Karthikeyan Bharagavan, and **Jean Yang**. Secure Distributed Programming with Value-Dependent Types. *International Conference on Functional Programming (ICFP)* 2011.

Jean Yang and Chris Hawblitzel. Safe to the Last Instruction: Automated Verification of a Type-Safe Operating System. *Programming Languages Design and Implementation (PLDI)* 2010. **Best paper award.**

Awards and honors

- **Levine Fellowship**, 2014-2015.
- **Gigam 10 for 2013 Cloud Trailblazers**, 2013.
- **Facebook Fellowship**, 2012-2013.
- **Best Paper Award**, Programming Language Design and Implementation (PLDI), 2009.
- **National Science Foundation Graduate Research Fellowship**, 2008-2011.
- Member, **Phi Beta Kappa** honor society, inducted May 2008.

Research talks

Jeeves: A Language for Automatically Enforcing Privacy Policies.

- Cornell University (August 2014)
- Columbia University (May 2014)
- Microsoft Research - Cambridge (October 2013)
- Gigaom Structure Conference (June 2013)
- Facebook - Menlo Park (March 2012)
- Google - Mountain View (April 2012)
- University of California, Berkeley (April 2012)
- Brown University (June 2012)
- Tufts University (Colloquium, December 2012)
- New York University (April 2011)
- Google - New York (July 2011)
- Northeastern University (December 2011)
- Harvard University (December 2011)

Public speaking

- **Challenging Technical Privilege: How Race and Gender Matter**, MIT (October 2014).
- **Panel: Graduate School 101**, Scientista Symposium, MIT (April 2013).
- **Panel: How I Got There**, Women in Advanced Computing (WiAC) Summit, San Jose, CA (June 2013).

Positions held

Research

Summer 2010 **Research Intern, Programming Languages and Analysis Group**, *Microsoft Research*, Redmond, WA.
Worked with Nikhil Swamy and Juan Chen on extending a security-typed language, to support secure marshalling and cryptographic proofs.

Summer 2009 **Research Intern, Operating Systems Group**, *Microsoft Research*, Redmond, WA.
Worked with Chris Hawblitzel to build an operating system kernel verified for type-safety.

Summer 2006 **Research Intern**, *Computational Biology Initiative, Harvard Medical School*, Boston, MA.
Worked with Dennis Wall and Leon Peshkin to develop and implement computational processes for tracing evolution and coevolution of presynaptic receptors.

Industry

Summer 2012 **Software Engineering Intern**, *Facebook, Inc.*, Menlo Park, CA.
Built verifier for backend privacy language. Filed patent.

Summer 2008 **Software Engineering Intern**, *Peerium, Inc.*, Cambridge, MA.
Worked at start-up creating a dependently typed functional language written in Haskell. Created parser for core language; wrote compiler optimizations; worked on GUI libraries.

Summer 2007 **Software Engineering Intern**, *Google, Inc.*, Santa Monica, CA.
Completed standalone project on video search team using C++. Received full-time offer.

Summer 2005 **Software Development Intern**, *Mellon Financial*, Pittsburgh, PA.
Worked on data mapping and management project using SQL and ColdFusion.

Teaching

Fall 2012 **Recitation Instructor, Elements of Software Construction**, *Massachusetts Institute of Technology*.
Designed and taught mini-curriculum for introducing Scala to undergraduate students in course teaching concepts using Java and Python.

Fall 2010 **Teaching Assistant, Foundations of Program Analysis**, *Massachusetts Institute of Technology*.
Designed and graded assignments and held recitations for graduate-level program analysis course.

January 2010 **Instructor, C Memory Management and C++ Object-Oriented Programming**, *Massachusetts Institute of Technology*.
Designed and co-taught a for-credit Independent Activities Period (IAP) course for over 100 undergraduates. Prepared lectures and assignments; managed multiple graders; published materials on MIT's Open Courseware.

January 2010 **Instructor, So You've Always Wanted to Learn Haskell?**, *Massachusetts Institute of Technology*.
Designed and co-taught an Independent Activities Period (IAP) course introducing the Haskell language and its applications.

Spring 2008 **Teaching Fellow, Principles of Programming Languages**, *Harvard University*.
Helped with new course introducing programming languages concepts using the Coq proof assistant. Effectiveness rating 4.6/5.0. Received Certificate of Distinction in Teaching.

Spring 2007 **Teaching Fellow, Introduction to Computer Science II**, *Harvard University*.
Responsible for problem sets, exams, section, and office hours for course using Scheme and C++. Effectiveness rating 4.6/5.0; nominated for Undergraduate Council's Levenson Teaching Prize.

Fall 2006 **Teaching Fellow, Introduction to Formal Systems**, *Harvard University*.
Responsible for problem sets, exams, section, and office hours for course on computational models and complexity. Effectiveness rating 4.2/5.0. Nominated for departmental teaching award.

Fall 2005 **Course Assistant, Introduction to Calculus**, *Harvard University*.
Graded problem sets and ran weekly problem session. Effectiveness rating rating 4.4/5.0.

Mentoring

Research mentoring

2013-2014 Supervised a Masters of Engineering thesis titled "Jelf: a Web Framework for Automatic Enforcement of Privacy Policies."

2011-2012 Supervised two high school students through MIT's Program for Research in Mathematics, Engineering, and Science (PRIMES).

2009-present Supervised term-time, IAP, and summer undergraduates through MIT's Undergraduate Research Opportunities Program (UROP).

Career mentoring

2011-2012 Served as graduate mentor for undergraduate women in the Society of Women Engineers (SWE) Mentoring Program.

Service and leadership

Program committees
- Principles of Programming Languages Artifact Evaluation Committee (POPL AEC, 2015).
- ML Workshop (2014).

Founder, organizer **MIT Programming Languages Seminar**. Started a weekly forum for professors and students to present ideas related to programming languages. Ran seminar 2010-2011.

MIT Programming Languages/Software Engineering Research Off-site. Started annual day-long off-site retreat with the MIT research groups in Programming Languages, Software Engineering, and Human-Computer Interaction. Served on planning committee 2010 and 2011, advised planning for subsequent retreats.

Graduate Women at MIT. Co-founded an institute-wide organization with 1500 members (as of spring 2012), over 80 planning committee members, and a budget of over $20K. Developed constitution and mission, raised funds, established campus collaborations, and recruited members. Served as Executive Board member from 2009 to present and Planning Co-Chair for two conferences (spring 2010, spring 2011).

Harvard College Engineering Society. Founding member 2005-2008; President 2006-2007. Started joint Harvard-MIT team for international competition in the small-size league for autonomous robotic soccer. Raised tens of thousands in budget; recruited dozens of members. Organized community-building activities for the School of Engineering and Applied Sciences.

Student representative

MIT EECS Faculty Hiring Committee. Attended talks, interviewed faculty candidates, and provided feedback on candidates (spring 2013).

MIT EECS Visiting Committee. Selected to provide student perspective on department and student life to the Visiting Committee (2013, 2014).

Harvard Computer Science task force. Served on task force of professors and students to improve department life for graduate and undergraduate students (fall 2009).

Selected press

Fast CoExist (2014): "A Better Way To Protect Privacy? Take The Programmer Out Of The Equation." Jessica Leber, March 7.

Wired (2014): "Out in the Open: A New Programming Language With Built-In Privacy Protocols." Klint Finley, March 3.

Gigaom (2014): "Want to build privacy into your apps? Check out Jeeves, now available in Python." Barb Darrow, Feb. 11.

MIT Technology Review (2014): "New Programming Language Removes Human Error from Privacy Equation." CSAIL, Feb. 10.

Gigaom (2013): "Cloud Trailblazers: 10 for 2013. Mission Possible? Jean Yang." Barb Darrow, May 28.

New Scientist (2012): "What your online friends reveal about where you are." Jacob Aron, January 25.

Softpedia (2010): "Verve - New non-Windows OS from Microsoft." Marius Oiaga, Dec. 10.

InfoQ (2010): "Announcing Verve - A Type-Safe Operating System." James Vastbinder, Dec. 8.

Other interests and activities

I am interested in science communication, especially about computer science and programming languages. Since fall 2013 I have been running **NeuWrite Boston**, a collaborative working group of scientists and writers. We meet once every three weeks to workshop pieces and discuss how to improve the state of science communication. As a result of our collaborations, members have published pieces in national venues.