

Benjamin Xie

Ph.D. Student

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The Information School
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Research Interests

My research focuses on developing interactions between people, computers, and data. I study how people develop understanding of code and data and develop interpretable tools which enable people and computers to cooperate. My interests span *human-computer interaction (mixed-initiative interactions)*, *artificial intelligence (model interpretability)*, *intelligent tutoring systems*, and *computing & data science education*.

Education

University of Washington, Seattle, WA 9/2016-
Ph.D. in Information Science
Code & Cognition Lab
Advisor: Andrew Ko

Massachusetts Institute of Technology, Cambridge, MA 9/2015-6/2016
Master of Engineering in Electrical Engineering and Computer Science
Master's Thesis: *Progression of Computational Thinking Skills Demonstrated by App Inventor Users*, Advisor: Hal Abelson

Massachusetts Institute of Technology, Cambridge, MA 9/2011-6/2015
Bachelor of Science in Computer Science & Engineering

Professional Experience

University of Washington, Seattle, WA 9/2016-
RESEARCH ASSISTANT - The Information School (Code & Cognition Lab)
Developing computational models and online tools that enable self-guided learners to develop computing competencies.
Current projects: Intelligent tutor to teach introductory computer science using a negotiated pedagogical model; improving novice programmers' code tracing strategies.
Advisor: Andrew Ko

Massachusetts Institute of Technology, Cambridge, MA 1/2014-5/2016
RESEARCH ASSISTANT - MIT App Inventor (Center for Mobile Learning)
Master's and undergraduate research on analyzing user data to model, understand, and improve learning experiences of web tool that teaches app development
Advisor: Hal Abelson

NovoEd, San Francisco, CA 6/2015-8/2015
SOFTWARE ENGINEERING INTERN - Wrote automated tests and trending algorithm for social online learning environment

AppNexus, New York, NY 6/2014-8/2014
SOFTWARE ENGINEERING INTERN - Created system to integrate and streamline log data

eBay, San Jose, CA 6/2013-8/2013
SOFTWARE ENGINEERING INTERN - Performed data analysis on cross-platform usage and behavior on marketplace

Massachusetts Institute of Technology, Cambridge, MA 5/2012-1/2013
RESEARCH ASSISTANT - MIT Teacher Education Program - Prototyped and tested learning resources for location-based augmented reality game, improved web-based game authoring tool. Advisors: Lisa Stump, Judith Perry

Awards & Honors

National Science Foundation (NSF) Graduate Research Fellowship	2016-2021
Nomination to Golden Key Honour Society	2017
MIT EECS - Google Research and Innovation Scholar	2014-2015
USTFCCCA All-Academic Honoree in Cross Country, Track	2013-2016
Outside Lands Hackathon (Outside Hacks) Winner	2015

Funding

National Science Foundation Graduate Research Fellowship (NSF GRFP)	9/2015-6/2021
Research Assistantship with MIT App Inventor (MIT Center for Mobile Learning)	9/2015-5/2016
MIT SuperUROP Program	9/2014-5/2015

Publications

Peer-Reviewed Papers

1. Xie, B., G. L. Nelson, and A. J. Ko (2018). "An Explicit Strategy to Scaffold Novice Program Tracing". In: *Proceedings of the 2018 ACM SIGCSE Technical Symposium on Computer Science Education*. SIGCSE 18. To appear. ACM.
2. Nelson, G. L., B. Xie, and A. J. Ko (2017). "Comprehension First: Evaluating a Novel Pedagogy and Tutoring System for Program Tracing in CS1". In: *Proceedings of the 2017 ACM Conference on International Computing Education Research*. ICER 17. ACM, 211. <http://doi.acm.org/10.1145/3105726.3106178>.
3. Xie, B. and H. Abelson (2016). Skill Progression in MIT App Inventor. In: *IEEE Symposium on Visual Languages and Human Centric Computing (VLHCC)*. VLHCC 2016.
4. Xie, B., I. Shabir, and H. Abelson (2015). Measuring the Usability and Capability of App Inventor to Create Mobile Applications. In: *Proceedings of the 3rd International Workshop on Programming for Mobile and Touch*. PROMOTO 2015.

Posters

1. Xie, B. and H. Keuning (2017). *NAP Tutor: Scaffolding to support reading code*. Carnegie Mellon University LearnLab Summer School. Pittsburgh, PA.
2. Xie, B. (2016). *Progression of Computational Thinking Skills Demonstrated by App Inventor Users*. MIT App Inventor Summit. Cambridge, MA.
3. Xie, B. (2014). *Errors and Debugging of Blocks Based Programming in App Inventor*. SuperUROP Fall Poster Session. Cambridge, MA.
4. Xie, B. (2014). *Logging and Analyzing the Usage Patterns of Blockly Blocks in App Inventor*. MIT App Inventor Summit. Cambridge, MA.

Talks

1. Xie, B. (2016). *How We Develop Skills by Making Apps*. MIT Internet Policy Research Initiative All Hands Meeting. Cambridge, MA.
2. Xie, B. (2015). *Demonstration of MIT App Inventor*. 3rd International Workshop on Programming for Mobile and Touch (PROMOTO 2015). Pittsburgh, PA.
3. Xie, B. (2015). *Measuring the Usability and Capability of App Inventor to Create Mobile Applications*. CharlesRiverX Colloquium. Cambridge, MA.
4. Xie, B. (2014). *Apples to Apple: Making Machine Learning Make Sense*. 6.UAT Conference for High School Students. Cambridge, MA.

Workshops

1. Xie, B. (2016). "How do I get it to save?" *Persistent Data in App Inventor*. 2016 MIT App Inventor Summit. Slides: goo.gl/G3wbhx.

Panels

1. Xie, B. (2015). *MIT CS-visit-day*. Q&A panel for underrepresented high school students interested in computer science. <http://web.mit.edu/cs-visit-day/>.

Book Contributions

1. Ko, A. J. (2017). *Cooperative Software Development*. <https://faculty.washington.edu/ajko/books/cooperative-software-development/>.

Teaching

Instructor

- UW INFO 370 - Introduction to Data Science (Fall 2017)

Teaching Assistant

- UW INFO 461 - Cooperative Software Design (Spring 2017). 32 undergraduates, 4.8/5.0
- Prospect Hill Academy - Introductory Computer Science (Fall 2014, Spring 2015)

Affiliations

- Association for Computing Machinery (ACM) Student, SIGAI 2017-
- International Educational Data Mining Society (IEDMS), 2014-
- Society of Learning Analytics Research (SOLAR), 2016-
- Institute of Electrical and Electronics Engineers (IEEE), 2016-

Service

To Profession

- Reviewer - *SIGCSE* 2018, *SIGCHI* 2018
- Mentor - *Google Summer of Code (MIT Media Lab)* 2016
- Program Committee - *EECScon (MIT EECS Undergraduate Research Conference)* 2014, 2015

To K-12 Education

- Educational Counselor - *Massachusetts Institute of Technology*, 2016-
- Senior Judge - *Technology Access Foundation (TAF) Academy STEM Expos*, 2016-
- Coach - *Math Counts (Rolling Hills Middle School)*, 2009-11

To Community

- Head of Education Co-Op, Planning Committee Member - *Seattle Data for Good*, 2017-
- Volunteer - *Seattle Street Youth Ministries*, 2017

Students Supervised

Masters

- Abhijit Suresh, CU Boulder via Google Summer of Code - first position: PhD student at CU
- Sylvan Tsai, MIT - first position: Amazon

Undergraduate

- Alex Tan, UW
- Leanne Hwa, UW
- Harrison Kwik, UW - first position: Master's student at UW CSE
- Xinyue Deng, MIT - first position: Master's student at MIT EECS