Benjamin Xie

PhD student, University of Washington

Research Interests

I am a human-computer interaction (HCI) researcher that builds interactive intelligent learning tools to teach computing more equitably. I design and implement systems where learners exercise agency while collaborating with intelligent agents to learn computing the way they want to.

topics human-computer interaction, interactive artificial intelligence, computing education, intelligent tutoring systems

Education

2016–   **Ph.D. in Information Science**, University of Washington, Seattle.
Advisor: Andrew J. Ko.

2015–2016   **M.Eng. in Computer Science**, Massachusetts Institute of Technology.
Advisor: Hal Abelson.
Thesis: *Progression of Computational Thinking Skills Demonstrated by App Inventor Users*

2011–2015   **B.S. in Computer Science**, Massachusetts Institute of Technology.
Advisor: Hal Abelson.

Experience

2016–   **University of Washington**, Research Assistant.
Code & Cognition Lab. Designing, implementing, and evaluating interactive intelligent learning tools to teach computing more equitably.

2014–2016   **Massachusetts Institute of Technology**, Research Assistant.
MIT App Inventor (Center for Mobile Learning). Analyzed user data to model, understand, and improve learning experiences of web tool that teaches app development.

2015   **NovoEd**, Software Engineering Intern.
Wrote automated tests and trending algorithm for social online learning environment.

2014   **AppNexus**, Software Engineering Intern.
Created system to integrate and steamline log data.

2013   **eBay**, Software Engineering Intern.
Performed large scale data analysis on cross-platform usage and behavior on marketplace.

2012–2013   **Massachusetts Institute of Technology**, Research Assistant.
MIT Education Arcade. Prototyped and tested learning resources for location-based augmented reality game, improved web-based game authoring tool.

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Awards

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

Peer-reviewed Publications

Unlike most other academic fields, fields of computer science (including human-computer interaction and computing education) have conferences which are selective venues for archival research. These conferences exceed many journals in their selectivity, visibility, and impact.

Journal Articles

Benjamin Xie, Dastyni Loksa, Greg L. Nelson, Matthew J. Davidson, Dongsheng Dong, Harrison Kwik, Alex Hui Tan, Leanne Hwa, Min Li, and Andrew J. Ko. A theory of instruction for introductory programming skills. *Computer Science Education*, 0(0):1–49, 2019.

Conference Papers

Benjamin Xie, Matthew J. Davidson, Min Li, and Andrew J. Ko. An Item Response Theory Evaluation of a Language-Independent CS1 Knowledge Assessment. In *Proceedings of the 2019 ACM SIGCSE Technical Symposium on Computer Science Education*, SIGCSE '19. ACM, 2 2019. Research Track.

Harrison Kwik, Benjamin Xie, and Andrew J. Ko. Experiences of Computer Science Transfer Students. In *Proceedings of the 2018 ACM Conference on International Computing Education Research*, ICER '18. ACM, 2018.

Benjamin Xie, Greg L Nelson, and Andrew J. Ko. An Explicit Strategy to Scaffold Novice Program Tracing. In *Proceedings of the 2018 ACM SIGCSE Technical Symposium on Computer Science Education*, SIGCSE '18. ACM, 2 2018. Research Track.

Greg L. Nelson, Benjamin Xie, and Andrew J. Ko. 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, pages 2–11. ACM, 2017.

Benjamin Xie and Hal Abelson. Skill Progression in MIT App Inventor. In *IEEE Symposium on Visual Languages and Human Centric Computing (VLHCC)*, VLHCC 2016, 9 2016.

Benjamin Xie, Isra Shabir, and Hal Abelson. 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, 10 2015.

Refereed Contributions

Posters

Benjamin Xie and Hieke Keuning. NAP Tutor: Scaffolding to support reading code, 7 2017. Carnegie Mellon University LearnLab Summer School. Pittsburgh, PA.

Benjamin Xie. Progression of Computational Thinking Skills Demonstrated by App Inventor Users, 6 2016. MIT App Inventor Summit. Cambridge, MA.

Benjamin Xie. Errors and Debugging of Blocks Based Programming in App Inventor, 12 2014. SuperUROP Fall Poster Session. Cambridge, MA.

Benjamin Xie. Logging and Analyzing the Usage Patterns of Blockly Blocks in App Inventor, 7 2014. MIT App Inventor Summit. Cambridge, MA.

Book Contributions

Andrew J. Ko. *Cooperative Software Development*. 2017. faculty.washington.edu/ajko/books/cooperative-software-development/.

Talks

Invited Talks

Benjamin Xie. How We Develop Skills by Making Apps, 5 2016. MIT Internet Policy Research Initiative (IPRI) All-Hands Meeting. Cambridge, MA.

Benjamin Xie. Demonstration of MIT App Inventor, 10 2015. 3rd International Workshop on Programming for Mobile and Touch (PROMOTO 2015). Pittsburgh, PA.

Benjamin Xie. Measuring the Usability and Capability of App Inventor to Create Mobile Applications, 9 2015. CharlesRiverX Colloquium. Cambridge, MA.

Benjamin Xie. Apples to Apple: Making Machine Learning Make Sense, 10 2014. 6.UAT Conference for High School Students. Cambridge, MA.

Workshops

Benjamin Xie. How do I get it to save? Persistent Data in App Inventor, 06 2016. 2016 MIT App Inventor Summit. Slides: goo.gl/G3wbhx.

Panels

Benjamin Xie. MIT CS Visit Day, 01 2015. Q&A panel for underrepresented high school students interested in computer science. http://web.mit.edu/cs-visit-day/.

Teaching

Instructor

Fall 2017	Introduction to Data Science (UW INFO 370). 34 undergraduates. 3.8/5.0

Teaching Assistant

Spring 2017	Cooperative Software Design (UW INFO 461). 32 undergraduates. 4.8/5.0
Fa 14, Sp 15	Introductory Computer Science (Prospect Hill Academy, Cambridge MA). ≈30 high school students.

Service

Reviewer

2018–	ACM Conference on Human Factors in Computing (CHI)
2018–	ACM Technical Symposium on Computer Science Education (SIGCSE)
2018	Journal of Information and Learning Sciences

Program Committee

2014–2015	MIT EECS Undergraduate Research Conference (EECScon)

Service to Graduate Education

2019	UW DUB Student Seminar Coordinator
2019	UW DUB Doctoral Consortium Co-Chair
2018	UW DUB PhD Student Retreat Coordinator
2018	UW Information School PhD Retreat Coordinator
2016	Google Summer of Code Mentor (on behalf of MIT Media Lab)

Service to K-12 Education

2016–	Educational Counselor. Massachusetts Institute of Technology
2016–	Mentor, Senior Judge. Technology Access Foundation (TAF) Academy STEM Expos

Service to Community

2017-2018	Director of Learning Co-op, Planning Committee Member. Seattle Data for Good
2017	Volunteer. Seattle Street Youth Ministries

Students Supervised

Masters

2016	Abhijit Suresh, CU Boulder via Google Summer of Code. First position: Ph.D. at CU
2016	Sylvan Tsai, MIT. First position: Amazon

Undergraduate

2018	William Kwok, UW
2018	Harshitha Akkaraju, UW
2016-2018	Harrison Kwik, UW
2017	Alex Hui Tan, UW. First position: Hazel Analytics
2017	Leanne Hwa, UW. First position: Deloitte
2015–2016	Xinyue Deng, MIT. First position: Master's at MIT EECS