

# BENJAMIN XIE

Ph.D. Candidate

**RESEARCH INTERESTS:** I am a human-computer interaction (HCI) researcher who designs interactive tools that support equity in computing education. I engage with the fields of HCI, computing education, and learning at scale.

## EDUCATION

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- 2016- **University of Washington, Seattle, WA**  
Ph.D. in Information Science  
Advisor: Amy J. Ko
- 2015-2016 **Massachusetts Institute of Technology, Cambridge, MA**  
M.Eng. in Computer Science  
Thesis: *Progression of Computational Thinking Skills Demonstrated by App Inventor Users*  
Advisor: Hal Abelson
- 2011-2015 **Massachusetts Institute of Technology, Cambridge, MA**  
B.S. in Computer Science  
Advisor: Hal Abelson

## ACADEMIC EXPERIENCE

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- 2020- **Code.org, Research Intern.** Mentor: Baker Franke
- 2016- **UW Code & Cognition Lab, Graduate Research Assistant.**  
Mentor: Amy J. Ko
- 2015-2016 **MIT App Inventor, Graduate Research Assistant.** Mentor: Hal Abelson
- 2014-2015 **MIT App Inventor, Undergraduate Research Assistant.**  
Mentor: Hal Abelson
- 2012-2013 **MIT Education Arcade, Undergraduate Research Assistant.**  
Mentors: Judy Perry, Lisa Stump

## PROFESSIONAL EXPERIENCE

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- 2015 **NovoEd, Software Engineering Intern**
- 2014 **AppNexus, Software Engineering Intern, API Team**
- 2013 **eBay, Software Engineering Intern, Marketplace Team**

## AWARDS & HONORS

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- 2020 Google Cloud Academic Research Grant
- 2020 National Science Foundation (NSF) INTERN Recipient
- 2016-2021 National Science Foundation (NSF) Graduate Research Fellowship
- 2014-2015 MIT EECS - Google Research and Innovation Scholar

## PEER-REVIEWED PUBLICATIONS

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*Content that is rigorously reviewed by peer experts as well as journal editors or conference program committee members.*

### The Effect of Informing Agency in Self-Directed Online Learning Environments

B. Xie, G. L. Nelson, H. Akkaraju, W. Kwok, A. J. Ko (2020)

L@S: ACM Learning at Scale

*Designed and evaluated three variations of self-directed online learning tool to explore how informing and affording agency affected engagement and learning outcomes*

### **Investigating Novices' In Situ Reflections on Their Programming Process**

D. Loksa, B. Xie, H. Kwik, A. J. Ko (2020)

SIGCSE: ACM Technical Symp. on CS Education

*Presented evidence that self-regulation use during programming varies, and that teaching self-regulation skills may require targeted instruction based on students' self-regulation and programming practices*

### **Towards a Validated Formative Assessment for Language-Specific Program Tracing Skills**

G. L. Nelson, B. Xie, A. Hu, A. J. Ko (2019)

Koli Calling

*Developed formative assessment with Kane's validity framework and situated framework within computing education*

### **An Item Response Theory Evaluation of a Language-Independent CS1 Knowledge Assessment**

B. Xie, M. J. Davidson, M. Li, A. J. Ko (2019)

SIGCSE: ACM Technical Symp. on CS Education

*Evaluated SCS1 language-agnostic concept inventory, using Item Response Theory to identify items that were problematic*

### **A Theory of Instruction for Introductory Programming Skills**

B. Xie, D. Loksa, G. L. Nelson, M. J. Davidson, D. Dong, H. Kwik, A. H. Tan, L. Hwa, M. Li, A. J. Ko (2019)

CSE: Computer Science Education Journal

*Proposed theory of instruction to teach four distinct programming skills incrementally and demonstrated that teaching these skills resulted in improvement in certain learning outcomes*

### **Experiences of Computer Science Transfer Students**

H. Kwik, B. Xie, A. J. Ko (2018)

ICER: ACM Int'l Computing Education Research Conf.

*Investigated experiences of computer science students who transferred to a university, finding that university interventions helped support social transition but did not eliminate gaps in academic performance*

### **An Explicit Strategy to Scaffold Novice Program Tracing**

B. Xie, G. L. Nelson, A. J. Ko (2018)

SIGCSE: ACM Technical Symp. on CS Education

*Described and evaluated a simple but powerful strategy to scaffold tracing of program execution. With <30 min of practice, novices in intro CS course had midterm grades 7% higher than a control group*

### **Comprehension First: Evaluating a Novel Pedagogy and Tutoring System for Program Tracing in CS1**

G. L. Nelson, B. Xie, A. J. Ko (2017)

ICER: ACM Int'l Computing Education Research Conf.

*Contributed a new theory of what it means to know a programming language, instruction based on their theory, and a computer-based tutorial for teaching this knowledge. Found that the tutorial resulted in improved learning gains*

### **Skill Progression in MIT App Inventor**

B. Xie, H. Abelson (2016)

VL/HCC: IEEE Symp. on Visual Languages & Human-Centric Computing

*Found that long-term users of App Inventor tend to expand breadth of programming knowledge (use new blocks) before depth (use blocks in more complex ways)*

### **Measuring the Usability and Capability of App Inventor to Create Mobile Applications**

B. Xie, I. Shabir, H. Abelson (2015)

PROMOTO: Workshop on Programming for Mobile and Touch

*Investigated the usability and realized capability of >5,000 App Inventor projects, finding that the order of App Inventor tutorials heavily influence the usability of App Inventor to implement particular functionalities*

## CURATED PUBLICATIONS

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*Content selected from submissions or invited by magazines editors or conference chairs.*

### **How Data Can Support Equity in Computing Education**

*B. Xie (2020)*

XRDS: ACM Crossroads Magazine

*Article describing techniques I am exploring in my dissertation to use data to support equity in computing education.*

### **It Is Time for More Critical CS Education**

*A. J. Ko, A. Oleson, N. Ryan, Y. Register, B. Xie, M. Tari, M. J. Davidson, S. Druga, D. Loksa (2020)*

CACM: Communications of the ACM

*Position article calling for more critical lens to computer science education.*

### **Learning and Education in HCI: A Reflection on the SIG at CHI 2019**

*V. Pammer-Schindler, E. Harpstead, B. Xie, B. DiSalvo, A. Kharrufa, P. Slovak, A. Ogan, J. J. Williams, M. J. Lee (2019)*

IX: ACM Interactions Blog

*Follow-up report on our CHI 2019 SIG on learning, education, and HCI*

### **Learning, Education, and HCI**

*B. Xie, E. Harpstead, B. DiSalvo, P. Slovak, A. Kharrufa, M. J. Lee, V. Pammer-Schindler, A. Ogan, J. J. Williams (2019)*

CHI: ACM Conf. on Human Factors in Computing Systems

*Proposed special interest group to foster the intersection of HCI and learning sciences.*

## DOCTORAL COLLOQUIUM/ CONSORTIUM

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*Opportunities for doctoral students to engage with peers and faculty members to advance their research.*

### **Supporting Equity in Computing Education with Student-Led Interactions with Data**

*B. Xie, UW DUB Doctoral Colloquium 2020*

### **Human-AI Collaborations within Computing Education**

*B. Xie, iConference 2019*

## TEACHING

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INSTRUCTOR	UW INFO 370: Introduction to Data Science (Fa '17)
TEACHING ASSISTANT	UW INFO 371: Advanced Methods in Data Science (Wi '21)
	UW INFO 201: Technical Foundations of Informatics (Fa '19)
	UW INFO 461: Cooperative Software Design (Sp '17)
	Prospect Hill Academy Intro to Computer Science (Fa '14, Sp '15)

## SERVICE

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REVIEWER	CHI (2018, 20, 21), UIST (2019), TOCE (2019), SIGCSE (2018, 19), ICIS (2020), Journal of Information and Learning Sciences (2018)
STUDENT CO-ORDINATOR	UW HCI Seminar (2020-21), UW DUB Seminar (2019), UW DUB Doctoral Colloquium (2019), UW DUB PhD Student Retreat (2018), UW Information School PhD Retreat (2018)
PROGRAM COMMITTEE	EECScon: MIT EECS Undergrad Research Conference (2014, 15)
MENTOR	Technology Access Foundation (TAF) Academy STEM Expo (2016-2019) Google Summer of Code (on behalf of MIT Media Lab, 2016)
EDUCATIONAL COUNSELOR	Massachusetts Institute of Technology (2016-21)

## STUDENTS SUPERVISED

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2019	Christina Zhang, UW
2018-19	William Kwok, UW. First position: Qualtrics Harshitha Akkaraju, UW. First position: Microsoft
2018	Jane Quichocho, UW
2017	Alex Hui Tan, UW. First position: Hazel Analytics Leanne Hwa, UW. First position: Deloitte
2016-2018	Harrison Kwik, UW. First position: PhD at Northwestern TSB
2016	Abhijit Suresh, CU Boulder via Google SoC. First position: Ph.D. at CU CS Sylvan Tsai, MIT. First position: Amazon
2015-16	Xinyue Deng, MIT. First position: Master's at MIT EECS

*Updated December 22, 2020*