

Toby Jia-Jun Li

Curriculum Vitae

Human-Computer Interaction Institute
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Research Interests

Human-Computer Interaction (HCI), End-User Development, Programming by Demonstration, Multi-modal Interaction, Natural Language Programming, Instructable Agents, Human-Agent Interaction

Education

- Ph.D. in Human-Computer Interaction (*in progress*)** **2015 – Present**
Carnegie Mellon University, *Pittsburgh, PA*
Human Computer Interaction Institute, School of Computer Science
Advisor: Dr. Brad A. Myers
- B.S. with Distinction in Computer Science** **2012 – 2015**
University of Minnesota, *Minneapolis, MN*
Department of Computer Science and Engineering
Advisor: Dr. Brent J. Hecht

Peer-reviewed Conference Papers

- [C.8] **Toby Jia-Jun Li**, Igor Labutov, Xiaohan Nancy Li, Xiaoyi Zhang, Wenze Shi, Wanling Ding, Tom M. Mitchell and Brad A. Myers. A Multi-Modal Interface for Specifying Data Descriptions in Programming by Demonstration Using Verbal Instructions. *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*.
- [C.7] **Toby Jia-Jun Li** and Oriana Riva. 2018. KITE: Building conversational bots from mobile apps. *Proceedings of the 16th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys 2018)*.
- [C.6] **Toby Jia-Jun Li**, Yuanchun Li, Fanglin Chen and Brad A. Myers. 2017. Programming IoT Devices by Demonstration Using Mobile Apps. *End-User Development. International Symposium on End User Development (IS-EUD) 2017. LNCS, vol. 10303. Best Paper Award.*

- [C.5] **Toby Jia-Jun Li**, Amos Azaria and Brad A. Myers. 2017. SUGILITE: Creating Multimodal Smartphone Automation by Demonstration. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI 2017). Best Paper Honorable Mention Award.*

- [C.4] Yuanchun Li, Fanglin Chen, **Toby Jia-jun Li**, Yao Guo, Gang Huang, Matthew Fredrikson, Yuvraj Agarwal and Jason I. Hong. 2017. PrivacyStreams: Enabling Transparency in Personal Data Processing for Mobile Apps. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (PACM IMWUT / UbiComp 2017)*.
- [C.3] Isaac Johnson, Yilun Lin, **Toby Jia-Jun Li**, Andrew Hall, Aaron Halfaker, Johannes Schöning and Brent Hecht. 2016. Not at Home on the Range: Peer Production and the Urban/Rural Divide. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI 2016)*.

- [C.2] **Toby Jia-Jun Li**, Shilad Sen and Brent Hecht. 2014. *Leveraging Advances in Natural Language Processing to Better Understand Tobler's First Law of Geography*. *Proceedings of the 22nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL 2014)*.
- [C.1] Shilad Sen, **Toby Jia-Jun Li**, WikiBrain Team and Brent Hecht. 2014. WikiBrain: Democratizing Computation on Wikipedia. *Proceedings of the 10th International Symposium on Open Collaboration (OpenSym / WikiSym 2014)*.

Book Sections

- [B.2] **Toby Jia-Jun Li**, Igor Labutov, Brad A. Myers, Amos Azaria, Alexander I. Rudnicky and Tom M. Mitchell. 2018. Teaching Agents When They Fail: End User Development in Goal-oriented Conversational Agents. Chapter of *Studies in Conversational UX Design*, Robert J. Moore, Margaret H. Szymanski, Raphael Arar, Guang-Jie Ren eds. Springer.
- [B.1] Brad A. Myers, Andrew Ko, Chris Scaffidi, Stephen Oney, YoungSeok Yoon, Kerry Chang, Mary Beth Kery and **Toby Jia-Jun Li**. 2017. Making End User Development More Natural. Chapter of *New Perspectives in End-User Development*, Fabio Paternò and Volker Wulf, eds. Springer.

Posters and Workshop Papers

- [W.5] Marissa Radensky, **Toby Jia-Jun Li**, and Brad A. Myers. 2018. How End Users Express Conditionals in Programming by Demonstration for Mobile Apps. *2018 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*. Lisbon, Portugal. October 2, 2018.
- [W.4] **Toby Jia-Jun Li**, Igor Labutov, Xiaohan Nancy Li, Tom M. Mitchell and Brad A. Myers. 2018. Supporting Co-Adaptive Human-Agent Relationship through Programming by Demonstration using Existing GUIs. *Rethinking Interaction CHI 2018 Workshop*.
- [W.3] **Toby Jia-Jun Li**. 2017. End User Mobile Task Automation using Multimodal Programming by Demonstration. *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2017) Graduate Consortium*.
- [W.2] **Toby Jia-Jun Li**, Brad A. Myers, Amos Azaria, Igor Labutov, Alexander I. Rudnicky and Tom M. Mitchell. 2017. *Designing a Conversational Interface for a Multimodal Smartphone Programming-by-Demonstration Agent*. *Conversational UX Design CHI 2017 Workshop*.
- [W.1] **Toby Jia-Jun Li** and Brad A. Myers. 2016. Smartphone Text Entry in Cross-Application Tasks. *CHI 2016 Workshop on Inviscid Text Entry and Beyond*.

Invited Talks and Presentations

- [P.5] Brad A. Myers and **Toby Jia-Jun Li**. 2018. Teaching Intelligent Agents New Tricks: Natural Language Instructions plus Programming-by-Demonstration for Teaching Tasks. *Human Computer Interaction Consortium (HCIC '18)*. Watsonville, CA. June 25, 2018.
- [P.4] **Toby Jia-Jun Li** and Brad A. Myers. 2018. SUGILITE: Enabling InMind Agent to Learn New Tasks from User Demonstration. Talk at Oath (formerly Yahoo!). Sunnyvale, CA. May 30, 2018.
- [P.3] **Toby Jia-Jun Li**, Josh Ford, Doug Downey, Brent Hecht, Vijay Murganoor and Shilad Sen. 2015. Atlasify – The Geography of Everything. *3M Science and Engineering Symposium*. St Paul, MN. June 25, 2015.

- [P.2] **Toby Jia-Jun Li**, Josh Ford, Doug Downey, Brent Hecht, Vijay Murganoor and Shilad Sen. 2015. Atlasify – The Geography of Everything. *The Social Media and Business Analytics Collaborative (SOBACO) Spring Research Symposium*. Minneapolis, MN. May 14, 2015.
- [P.1] **Toby Jia-Jun Li** and Brent Hecht. 2014. WikiBrain: Making Computer Programs Smarter with Knowledge from Wikipedia. *The Social Media and Business Analytics Collaborative (SOBACO) Spring Research Symposium*. Minneapolis, MN. May 6, 2014.

Research Experience

Graduate Research Assistant

Aug. 2015 – Present

Human-Computer Interaction Institute, Carnegie Mellon University

- Working on various research projects on end user development, instructable intelligent agents, human-AI interaction and natural language programming.

Engineering Implementation Consultant

Aug. 2017 – Dec. 2017

Research Intern

May. 2017 – Aug. 2017

Microsoft Research, Redmond, WA

Mentor: Dr. Oriana Riva

- Designed and developed a new conversational bot development tool using deep neural network, user task modeling and mobile app analysis. [C. 7]

Research Assistant

Jan. 2013 – Aug. 2015

GroupLens Research, University of Minnesota

- Led the development and deployment of ATLASIFY – a novel interactive spatial visualization and exploratory search system used by over 10,000 unique users at its peak. [P. 2] [P. 3]
- Developed major parts of WIKIBRAIN – a popular open-source software framework for knowledge mining and computation on Wikipedia. [C. 1] [P. 1]
- Designed and conducted spatial and natural language analysis on Wikipedia data for evaluating Tobler’s First Law of Geography and measuring the urban/rural bias in Wikipedia. [C. 2] [C. 3]

Teaching Experience

Teaching Assistant, 05391 / 05891: Designing Human-Centered Software

Spring 2019

Human-Computer Interaction Institute, Carnegie Mellon University

Teaching Assistant, 05410 / 05610: User-Centered Research & Evaluation

Fall 2018

Human-Computer Interaction Institute, Carnegie Mellon University

Teaching Staff, CSCI 5715: From GPS and Google Maps to Spatial Computing

Fall 2014

Coursera MOOC & Dept. of Computer Science and Engineering, Univ. of Minnesota

Teaching Assistant, CSCI 2011: Discrete Structures of Computer Science

Fall 2013, Spring 2014

Department of Computer Science and Engineering, University of Minnesota

Students Mentored

Tiffany Cai (CMU undergraduate)

Spring 2017

- Worked on a new mobile keyboard for recording text entries in demonstration.

Jeremy Wei (CMU undergraduate)

Spring 2017

- Worked on identifying crucial actions in demonstrated scripts.

Xiaohan Nancy Li (CMU undergraduate, now at Microsoft) - <i>Worked on representing and querying snapshots of mobile GUIs.</i> [C.8] [W.4]	Fall 2017
Wenze Shi (CMU undergraduate) - <i>Worked on extracting semantic entities from mobile GUIs.</i> [C.8]	Spring 2018
Wanling Ding (CMU undergraduate) - <i>Worked on generating user friendly representations for demonstrated scripts.</i> [C.8]	Spring 2018
Marissa Radensky (Amherst College, summer intern at CMU) - <i>Worked on supporting conditionals in mobile programming by demonstration.</i> [W.5]	Summer 2018

Selected Honors, Grants and Awards

Yahoo! InMind Fellowship (<i>\$400,000 over 4 years</i>)	2016 – 2019
NSF Travel Grant for ACM MobiSys 2018 (<i>\$1,500</i>)	2018
Rethinking Interaction CHI 2018 Workshop Travel Grant (<i>\$1,000</i>)	2018
IS-EUD 2017 Best Paper Award	2017
CHI 2017 Best Paper Honorable Mention Award	2017
2016 Bosch/Bezirk Internet of Things Hackathon – 1st place (<i>\$1,000</i>)	2016
University of Minnesota Gold Global Excellence Scholarship (<i>\$33,680 over 4 years</i>)	2012 – 2015
UROP Undergraduate Research Opportunity Program Grant (<i>\$1,400</i>)	2013 – 2014
NSF Travel Grant for ACM SIGSPATIAL 2014 (<i>\$720</i>)	2014
ESRI Scholarship (<i>\$2,000</i>)	2014
University of Minnesota Cultural Corps Awards (<i>\$150</i>)	2014
University of Minnesota College of Science and Engineering: Dean’s List	2012 – 2015
ACM/ICPC International Collegiate Programming Contest Word Final Qualifier	2013

Professional Service

Academic Service

- Associate Chair**, ACM CHI 2019 Late Breaking Work (LBW) Program Committee
- Session Chair**, ACM CHI 2019 Session on *Conversational Interactions*

Department and Community Service

- Committee Member**, CMU HCII Ph.D. Admissions Committee (2018-2019)
- Student Volunteer**, ACM IUI 2019, ACM SIGSPATIAL 2014

Paper Reviewing

- Conferences:** ACM CHI (2017-2019), ACM UIST (2017-2019), ACM CSCW (2018-2019), ACM DIS (2018-2019), ACM MobileHCI (2018-2019), ACM TEI (2018), ACM SIGCSE (2018)
- Received “special recognitions” for excellent reviews for ACM UIST 2017 and ACM CHI 2018
- Journals:** ACM IMWUT (2017-2019), IEEE TMC (2018), IEEE Pervasive (2018), IJGIS (2017)

Languages

English – Native or bilingual proficiency, **Chinese (Mandarin)** – Native or bilingual proficiency

Technical Skills

Programming Languages: C/C++, Java, Python, Scheme, Android, JavaScript, SQL, HTML and others

Keywords: Machine Learning, Deep Learning, Natural Language Processing, Dialog Systems, Conversational UX