

# Toby Jia-Jun Li

## *Curriculum Vitae*

Human-Computer Interaction Institute  
School of Computer Science  
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### Research Interests

Human-Computer Interaction (HCI), Intelligent User Interface, End-User Development, Programming by Demonstration, Multi-modal Interaction, Conversational Agents.

### 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, Wenzhe 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 SUGILITE, a system that enables end-users to program conversational agents for arbitrary task in any third-party Android app using a combination of demonstration and verbal instructions.

### 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 models, user task modeling and mobile app analysis.

### Research Assistant

**Jan. 2013 – Aug. 2015**

GroupLens Research, University of Minnesota

- Developed ATLASIFY – a novel information retrieval / interactive visualization system supporting exploratory search.
- Built large portions of WIKIBRAIN – a popular open-source software framework for knowledge mining and computation on Wikipedia.
- Conducted the first robust evaluation of Tobler’s First Law of Geography leveraging advances in Wikipedia-based natural language processing.

## Teaching Experience

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

**Fall 2018**

Human-Computer Interaction Institute, Carnegie Mellon University

- Led recitation sessions, held office hours and graded assignments.

### 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

- Recorded video lectures, designed assignments and monitored the discussion forum.

### Teaching Assistant, CSCI 2011: Discrete Structures of Computer Science

**Fall 2013, Spring 2014**

Department of Computer Science and Engineering, University of Minnesota

- Led recitation sessions, held office hours and graded assignments.

## Students Mentored

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

## Selected Honors, Grants and Awards

Yahoo! InMind Fellowship (\$300,000 over 3 years)	2016 – 2018
NSF Travel Grant for ACM MobiSys 2018 (\$1,500)	2018
Travel Grant for Rethinking Interaction CHI 2018 Workshop (\$1,000)	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 (\$1,000)	2016
University of Minnesota Gold Global Excellence Scholarship (\$33,680 over 4 years)	2012 – 2015
UROP Undergraduate Research Opportunity Program Grant (\$1,400)	2013 – 2014
NSF Travel Grant for ACM SIGSPATIAL 2014 (\$720)	2014.10
ESRI Scholarship (\$2,000)	2014.5
University of Minnesota Cultural Corps Awards (\$150)	2014.5
University of Minnesota College of Science and Engineering: Dean’s List	2012 – 2015
ACM/ICPC International Collegiate Programming Contest Word Final Qualifier	2013
AP Scholar with Distinction.	2011

## Reviewing Experience

- CHI** (2017-2018), **UIST** (2017-2018), **IMWUT** (2017-2018), **CSCW** (2018), **MobileHCI** (2018), **DIS** (2018), **TEI** (2018), **IJGIS** (2017)
- Received “special recognitions” for excellent reviews for UIST 2017 and CHI 2018

## 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