

# Toby Jia-Jun Li

## *Curriculum Vitae*

Department of Computer Science and Engineering  
College of Engineering  
University of Notre Dame  
Notre Dame, IN 46556 USA

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Tel: (574) 631-5375  
Twitter: [@TobyJLi](https://twitter.com/TobyJLi)

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## Research Interests

Human-Computer Interaction (HCI), Human-AI Interaction, Multi-Modal Interaction, Human-Centered Machine Learning, End-User Development, Programming Tools, Human-Centered Data Science.

## Professional Appointments

<b>Assistant Professor</b>	2021–Present
University of Notre Dame, <i>Notre Dame, IN</i>	
Department of Computer Science and Engineering	

## Education

<b>Ph.D. in Human-Computer Interaction</b>	2021
Carnegie Mellon University, <i>Pittsburgh, PA</i>	
Human Computer Interaction Institute, School of Computer Science	
<i>Advisor:</i> Brad A. Myers	
<i>Committee:</i> Tom M. Mitchell, Jeffery P. Bigham, John Zimmerman, and Philip J. Guo	
<b>B.S. with Distinction in Computer Science</b>	2015
University of Minnesota, <i>Minneapolis, MN</i>	
Department of Computer Science and Engineering	
<i>Advisor:</i> Brent J. Hecht	

## Selected Honors and Awards

AnalytiXIN Faculty Fellowship	2022
Google Research Scholar Award	2022
CMU School of Computer Science Honorable Mention Dissertation Award	2021
CHI 2021 Best Paper Honorable Mention Award [C.14]	2021
UIST 2020 Best Paper Award [C.13]	2020
Yahoo! InMind Fellowship ( <i>Full support for 4 years</i> )	2016–2019
IS-EUD 2017 Best Paper Award [C.6]	2017
CHI 2017 Best Paper Honorable Mention Award [C.5]	2017
VL/HCC 2017 Doctoral Consortium Grant	2017
2016 Bosch Internet of Things Hackathon – 1st place	2016
University of Minnesota Gold Global Excellence Scholarship	2012–2015

ESRI Scholarship (\$2,000)	2014
University of Minnesota Cultural Corps Award (\$150)	2014
ACM/ICPC International Collegiate Programming Contest Word Final Qualifier	2013

## Major Refereed Conference Papers

(Underlines indicate students under my supervision)

- [C.30] **EyeTrans: Merging Human and Machine Attention for Neural Code Summarization**  
Yifan Zhang, Jiliang Li, Zachary Karas, Aakash Bansal, **Toby Jia-Jun Li**, Collin McMillan, Kevin Leach, and Yu Huang  
*Proceedings of the ACM International Conference on the Foundations of Software Engineering (FSE 2024).*
- [C.29] **An Empathy-Based Sandbox Approach to Bridge the Privacy Gap among Attitudes, Goals, Knowledge, and Behaviors**  
Chaoran Chen, Weijun Li, Wenxin Song, Fanny Ye, Yaxing Yao, and **Toby Jia-Jun Li**  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*
- [C.28] **SPICA: Interactive Video Content Exploration through Augmented Audio Descriptions for Blind or Low-Vision Viewers**  
Zheng Ning, Brianna L. Wimer, Kaiwen Jiang, Keyi Chen, Jerrick Ban, Yapeng Tian, Yuhang Zhao, and **Toby Jia-Jun Li**  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*
- [C.27] **Structured Generation and Exploration of Design Space with Large Language Models for Human-AI Co-Creation**  
Sangho Suh\*, Meng Chen\*, Bryan Min, **Toby Jia-Jun Li**, and Haijun Xia  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*
- [C.26] **CollabCoder: A Lower-barrier, Rigorous Workflow for Inductive Collaborative Qualitative Analysis with Large Language Models**  
Jie Gao, Yuchen Guo, Gionnieve Lim, Tianqin Zhang, Zheng Zhang, **Toby Jia-Jun Li**, and Simon Perrault  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*
- [C.25] **AutoDroid: LLM-powered Task Automation in Android**  
Hao Wen, Yuanchun Li, Guohong Liu, Shanhui Zhao, Tao Yu, **Toby Jia-Jun Li**, Shiqi Jiang, Yunhao Liu, Yaqin Zhang, and Yunxin Liu  
*Proceedings of the 30th Annual International Conference on Mobile Computing and Networking (MobiCom '24)*
- [C.24] **From Awareness to Action: Exploring End-User Empowerment Interventions for Dark Patterns in UX**  
Yuwen Lu, Chao Zhang, Yuewen Yang, Yaxing Yao, and **Toby Jia-Jun Li**  
*Proceedings of the ACM on Human-Computer Interaction (CSCW 2024)*
- [C.23] **Interactive Text-to-SQL Generation via Editable Step-by-Step Explanations**  
Yuan Tian, Zheng Zhang, Zheng Ning, **Toby Jia-Jun Li**, Jonathan Kummerfeld, and Tianyi Zhang  
*Proceedings of the the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023)*
- [C.22] **VISAR: A Human-AI Argumentative Writing Assistant with Visual Programming and Rapid Draft Prototyping**  
Zheng Zhang, Jie Gao, Ranjodh Singh Dhaliwal, and **Toby Jia-Jun Li**  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2023)*
- [C.21] **PEANUT: A Human-AI Collaborative Tool for Annotating Audio-Visual Data**  
Zheng Zhang\*, Zheng Ning\*, Chenliang Xu, Yapeng Tian, and **Toby Jia-Jun Li**  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2023)*

- [C.20] **PaTAT: Human-AI Collaborative Qualitative Coding with Explainable Interactive Rule Synthesis**  
Simret Araya Gebreegziabher\*, Zheng Zhang\*, Xiaohang Tang, Yihao Meng, Elena Glassman,  
 and **Toby Jia-Jun Li**  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2023)*
- [C.19] **An Empirical Study of Model Errors and User Error Discovery and Repair Strategies in Natural Language Database Queries**  
Zheng Ning\*, Zheng Zhang\*, Tianyi Sun, Yuan Tian, Tianyi Zhang, and **Toby Jia-Jun Li**  
*Proceedings of the 28th ACM Conference on Intelligent User Interfaces (IUI 2023)*
- [C.18] **A Bottom-Up End-User Intelligent Assistant Approach to Empower Gig Workers against AI Inequality**  
**Toby Jia-Jun Li**, Yuwen Lu, Jaylexia Clark, Meng Chen, Victor Cox, Meng Jiang, Yang Yang, Tamara Kay,  
 Danielle Wood, and Jay Brockman  
*Proceedings of the 1st Symposium on Human-Computer Interaction for Work (CHIWORK 2022)*
- [C.17] **It is AI's Turn to Ask Human a Question: Question and Answer Pair Generation for Children Storybooks in FairytaleQA Dataset**  
 Bingsheng Yao, Dakuo Wang, Tongshuang Wu, Zheng Zhang, **Toby Jia-Jun Li**, Mo Yu, and Ying Xu  
*Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (ACL 2022)*
- [C.16] **Fantastic Questions and Where to Find Them: FairytaleQA—An Authentic Dataset for Narrative Comprehension**  
 Ying Xu, Dakuo Wang, Mo Yu, Daniel Ritchie, Bingsheng Yao, Tongshuang Wu, Zheng Zhang, **Toby Jia-Jun Li**, Nora Bradford, Branda Sun, Tran Hoang, Yisi Sang, Yufang Hou, Xiaojuan Ma, Diyi Yang, Nanyun Peng, Zhou Yu, and Mark Warschauer  
*Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (ACL 2022)*
- [C.15] **StoryBuddy: A Human-AI Collaborative Agent for Parent-Child Interactive Storytelling with Flexible Parent Involvement**  
Zheng Zhang, Ying Xu, Yanhao Wang, Bingsheng Yao, Daniel Ritchie, Tongshuang Wu, Mo Yu, Dakuo Wang, and **Toby Jia-Jun Li**  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2022)*
- [C.14]  **Screen2Vec: Semantic Embedding of GUI Screens and GUI Components**  
**Toby Jia-Jun Li**, Lindsay Popowski, Tom M. Mitchell, and Brad A. Myers  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2021)*  
**Best Paper Honorable Mention Award**
- [C.13]  **Multi-Modal Repairs of Conversational Breakdowns in Task-Oriented Dialogs**  
**Toby Jia-Jun Li**, Jingya Chen, Haijun Xia, Tom M. Mitchell, and Brad A. Myers  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2020)*  
**Best Paper Award**
- [C.12] **Geno: A Developer Tool for Authoring Multimodal Interaction on Existing Web Applications**  
 Ritam Sarmah, Yunpeng Ding, Di Wang, Cheuk Yin Phipson Lee, **Toby Jia-Jun Li**, and Xiang 'Anthony' Chen  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2020)*
- [C.11] **Interactive Task Learning from GUI-Grounded Natural Language Instructions and Demonstrations**  
**Toby Jia-Jun Li**, Tom M. Mitchell, and Brad A. Myers  
*Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL 2020): System Demonstrations*

- [C.10] **Privacy-Preserving Script Sharing in GUI-based Programming-by-Demonstration Systems**  
**Toby Jia-Jun Li**, Jingya Chen, Brandon Canfield, and Brad A. Myers  
*Proceedings of the ACM on Human-Computer Interaction (CSCW 2020)*
- [C.9] **PUMICE: A Multi-Modal Agent that Learns Concepts and Conditionals from Natural Language and Demonstrations**  
**Toby Jia-Jun Li**, Marissa Radensky, Justin Jia, Kirielle Singarajah, Tom M. Mitchell, and Brad A. Myers  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2019)*
- [C.8] **A Multi-Modal Interface for Specifying Data Descriptions in Programming by Demonstration Using Verbal Instructions**  
**Toby Jia-Jun Li**, Igor Labutov, Xiaohan Nancy Li, Xiaoyi Zhang, Wenze Shi, Wanling Ding, Tom M. Mitchell, and Brad A. Myers  
*Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*
- [C.7] **KITE: Building Conversational Bots from Mobile Apps**  
**Toby Jia-Jun Li** and Oriana Riva  
*Proceedings of the the ACM Conference on Mobile Systems, Applications, and Services (MobiSys 2018)*
- [C.6] **Programming IoT Devices by Demonstration Using Mobile Apps**  
 **Toby Jia-Jun Li**, Yuanchun Li, Fanglin Chen, and Brad A. Myers  
*International Symposium on End User Development (IS-EUD 2017). LNCS, vol. 10303*  
**Best Paper Award**
- [C.5] **SUGILITE: Creating Multimodal Smartphone Automation by Demonstration**  
 **Toby Jia-Jun Li**, Amos Azaria, and Brad A. Myers  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2017)*  
**Best Paper Honorable Mention Award**
- [C.4] **PrivacyStreams: Enabling Transparency in Personal Data Processing for Mobile Apps**  
Yuanchun Li, Fanglin Chen, **Toby Jia-jun Li**, Yao Guo, Gang Huang, Matthew Fredrikson, Yuvraj Agarwal, and Jason I. Hong  
*Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (PACM IMWUT / UbiComp 2017)*
- [C.3] **Not at Home on the Range: Peer Production and the Urban/Rural Divide**  
Isaac Johnson, Yilun Lin, **Toby Jia-Jun Li**, Andrew Hall, Aaron Halfaker, Johannes Schöning, and Brent Hecht  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2016)*
- [C.2] **Leveraging Advances in Natural Language Processing to Better Understand Tobler's First Law of Geography**  
**Toby Jia-Jun Li**, Shilad Sen, and Brent Hecht  
*Proceedings of the ACM Conference on Advances in Geographic Information Systems (SIGSPATIAL 2014)*
- [C.1] **WikiBrain: Democratizing Computation on Wikipedia**  
Shilad Sen, **Toby Jia-Jun Li**, WikiBrain Team, and Brent Hecht  
*Proceedings of the International Symposium on Open Collaboration (OpenSym / WikiSym 2014)*

## Major Refereed Journal Papers

- [J.1] **Insights into Natural Language Database Query Errors: From Attention Misalignment to User Handling Strategies**  
Zheng Ning, Yuan Tian, Zheng Zhang, Tianyi Zhang, and **Toby Jia-Jun Li**  
*ACM Transactions on Interactive Intelligent Systems*, 2024

## Refereed Workshop Papers

- [W.10] **Prompt Learning Unlocked for App Promotion in the Wild**  
 Zhongyu Ouyang, Shifu Hou, Shang Ma, Chaoran Chen, Chunhui Zhang, **Toby Jia-Jun Li**, Xusheng Xiao, Chuxu Zhang, and Yanfang Ye  
*NeurIPS 2023 Workshop on New Frontiers in Graph Learning (GLFrontiers)*
- [W.9] **Exploring Mobile UI Layout Generation using Large Language Models Guided by UI Grammar**  
Yuwen Lu, Ziang Tong, Anthea Qinyi Zhao, Chengzhi Zhang, and **Toby Jia-Jun Li**  
*ICML 2023 Workshop on Artificial Intelligence and Human-Computer Interaction (AI&HCI)*
- [W.8] **Using Large Generative Models for Storyboarding: Challenges and Goals**  
Zheng Ning, Dingzeyu Li, and **Toby Jia-Jun Li**  
*CHI 2023 Workshop on Intelligent and Interactive Writing Assistants (In2Writing)*
- [W.7] **An Empirical Study of Developer Behaviors for Validating and Repairing AI-Generated Code**  
Ningzhi Tang\*, Meng Chen\*, Zheng Ning, Aakash Bansal, Yu Huang, Collin McMillan, and **Toby Jia-Jun Li**  
*The 13th Annual Workshop on the Intersection of PL and HCI (PLATEAU 2023)*
- [W.6] **MIMOSA: Human-in-the-Loop Generation of Spatial Audio from Videos with Monaural Audio**  
Zheng Ning\*, Zheng Zhang\*, Jerrick Ban, Kaiwen Jiang, Ruohong Gan, Yapeng Tian, and **Toby Jia-Jun Li**  
*ECCV 2022 Workshop on Visual Learning of Sounds in Spaces (AV4D)*
- [W.5] **AI as an Active Writer: Interaction Strategies with Generated Text in Human-AI Collaborative Fiction Writing**  
 Daijin Yang, Yanpeng Zhou, Zhiyuan Zhang, **Toby Jia-Jun Li**, and Ray LC  
*IUI 2022 Workshop on Human-AI Co-Creation with Generative Models (HAI-GEN 2022)*
- [W.4] **Building an Interactive Storytelling Conversational Agent through Parent-AI Collaboration**  
Zheng Zhang, Ying Xu, Yanhao Wang, Bingsheng Yao, Daniel Ritchie, Tongshuang Wu, Mo Yu, Dakuo Wang, and **Toby Jia-Jun Li**  
*CSCW 2021 Workshop on Inclusive and Collaborative Child-Facing Voice Technologies (CUI@CSCW)*
- [W.3] **Towards Effective Human-AI Collaboration in GUI-Based Interactive Task Learning Agents**  
**Toby Jia-Jun Li**, Jingya Chen, Tom M. Mitchell, and Brad A. Myers  
*CHI 2020 Workshop on Artificial Intelligence for HCI: A Modern Approach (AI4HCI)*
- [W.2] **Interactive Task and Concept Learning from Natural Language Instructions and GUI Demonstrations**  
**Toby Jia-Jun Li**, Marissa Radensky, Justin Jia, Kirielle Singarajah, Tom M. Mitchell, and Brad A. Myers  
*AAAI 2020 Workshop on Intelligent Process Automation (IPA-20)*
- [W.1] **A Multi-Modal Approach to Concept Learning in Task Oriented Conversational Agents**  
**Toby Jia-Jun Li**, Marissa Radensky, Tom M. Mitchell, and Brad A. Myers  
*CHI 2019 Workshop on Conversational Agents: Acting on the Wave of Research and Development*

## Lightly-Reviewed Publications and Extended Abstracts

- [L.13] **CodeGRITS: A Research Toolkit for Developer Behavior and Eye Tracking in IDE**  
 Ningzhi Tang, Junwen An, Meng Chen, Aakash Bansal, Yu Huang, Collin McMillan, **Toby Jia-Jun Li**  
*2024 IEEE/ACM 46th International Conference on Software Engineering (ICSE '24): Demo Track*
- [L.12] **Computational Methodologies for Understanding, Automating, and Evaluating User Interfaces**  
 Yue Jiang, Yuwen Lu, Tiffany Kneare, Clara Kliman-Silver, Christof Lutteroth, **Toby Jia-Jun Li**, Jeffery Nichols, and Wolfgang Stuerzlinger  
*Extended Abstracts of the 2024 ACM Conference on Human Factors in Computing Systems (CHI EA '24)*
- [L.11] **Future Advising: Can Academic Advising be Replaced by ChatGPT or Artificial Intelligence?**  
 Julia Qian and **Toby Jia-Jun Li**  
*National Academic Advising Association (NACADA) 2023 Annual Conference*
- [L.10] **Modeling Programmer Attention as Scanpath Prediction**  
 Aakash Bansal, Chia-Yi Su, Zachary Karas, Yifan Zhang, Yu Huang, **Toby Jia-Jun Li**, and Collin McMillan  
*The 38th IEEE/ACM International Conference on Automated Software Engineering (ASE 2023): The New Ideas and Emerging Results (NIER) Track*
- [L.9] **DiffCoder: A GPT-Powered Workflow for Collaborative Qualitative Analysis**  
 Jie Gao, Yuchen Guo, **Toby Jia-Jun Li**, and Simon Perrault  
*CSCW'23 Companion: Companion Publication of the 2023 Conference on Computer Supported Cooperative Work and Social Computing*
- [L.8] **Designing for AI-Powered Social Computing Systems**  
 Gionnieve Lim, Hyunwoo Kim, Yoonseo Choi, **Toby Jia-Jun Li**, Chinmay Kulkarni, Hariharan Subramonyam, Joseph Seering, Michael S. Bernstein, Amy X. Zhang, Elena Glassman, Simon Perrault, and Juho Kim  
*CSCW'23 Companion: Companion Publication of the 2023 Conference on Computer Supported Cooperative Work and Social Computing*
- [L.7] **Shaping the Emerging Norms of Using Large Language Models in Social Computing Research**  
 Hong Shen, Tianshi Li, **Toby Jia-Jun Li**, Joon Sung Park, and Diyi Yang  
*CSCW'23 Companion: Companion Publication of the 2023 Conference on Computer Supported Cooperative Work and Social Computing*
- [L.6] **SHAI 2023: Workshop on Designing for Safety in Human-AI Interactions**  
 Nitesh Goyal, Sungsoo Ray Hong, Regan Mandryk, **Toby Jia-Jun Li**, Kurt Luther, and Dakuo Wang  
*IUI 2023 Companion: The 28th ACM Conference on Intelligent User Interfaces*
- [L.5] **The Future of Computational Approaches for Understanding and Adapting User Interfaces**  
 Yue Jiang, Yuwen Lu<sup>@</sup>, Christof Lutteroth, **Toby Jia-Jun Li**, Jeffrey Nichols, and Wolfgang Stuerzlinger  
*Extended Abstracts of the 2023 ACM Conference on Human Factors in Computing Systems (CHI EA '23)*
- [L.4] **Computational Approaches for Understanding, Generating, and Adapting User Interfaces**  
 Yue Jiang, Yuwen Lu<sup>@</sup>, Jeffrey Nichols, Wolfgang Stuerzlinger, Chun Yu, Christof Lutteroth, Yang Li, Ranjitha Kumar, and **Toby Jia-Jun Li**  
*Extended Abstracts of the 2022 ACM Conference on Human Factors in Computing Systems (CHI EA '22)*
- [L.3] **Bridging the Gap Between UX Practitioners' Work Practices and Machine-Learning-Enabled Design Support Tools**  
 Yuwen Lu<sup>@</sup>, Chengzhi Zhang, Iris Zhang, and **Toby Jia-Jun Li**  
*Extended Abstracts of the 2022 ACM Conference on Human Factors in Computing Systems (CHI EA '22)*

- [L.2]     **How End Users Express Conditionals in Programming by Demonstration for Mobile Apps**  
 Marissa Radensky, **Toby Jia-Jun Li**, and Brad A. Myers  
*IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018) Poster Track*
- [L.1]     **End User Mobile Task Automation using Multimodal Programming by Demonstration**  
**Toby Jia-Jun Li**  
*IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2017) Graduate Consortium*

## Book Sections

- [B.3]     **Demonstration+ Natural Language: Multimodal Interfaces for GUI-based Interactive Task Learning Agents**  
**Toby Jia-Jun Li**, Tom M. Mitchell, and Brad A. Myers  
 Chapter of *Artificial Intelligence for Human Computer Interaction: A Modern Approach*. Springer. 2021.
- [B.2]     **Teaching Agents When They Fail: End User Development in Goal-Oriented Conversational Agents**  
**Toby Jia-Jun Li**, Igor Labutov, Brad A. Myers, Amos Azaria, Alexander Rudnicky, and Tom M. Mitchell  
 Chapter of *Studies in Conversational UX Design*. Springer. 2018.
- [B.1]     **Making End User Development More Natural**  
 Brad A. Myers, Amy Ko, Chris Scaffidi, Stephen Oney, YoungSeok Yoon, Kerry Chang, Mary Beth Kery, and **Toby Jia-Jun Li**  
 Chapter of *New Perspectives in End-User Development*. Springer. 2017.

## Patents

- [P.1]     **Automatically Generating Conversational Services from a Computing Application**  
 Oriana Riva, Jason Kace, Doug Burger, and **Toby Jia-Jun Li**  
 U.S. Patent 10,705,892. Granted July 7, 2020; Filed June 7, 2018.

## Grants and Gifts

### **NSF: FW-HTF-RM: Bridging AI Inequality in Digitally-Mediated Gig Work**

CMMI-2326378

Lead PI: Toby Li; Co-PI: Meng Jiang, Tamara Kay, Yang Yang, Jay Brockman

2023-2027; \$999,980 (Li's credit \$399,992)

### **NSF: Broadening Participation in Computing (BPC) Supplement to CCF-2211428 "Towards More Human-like AI Models of Source Code"**

CCF- 2315887

Lead PI: Collin McMillan; Co-PI: Toby Li

2023-2024; \$128,000

### **AnalytiXIN Idea Discovery Proposal: Human-AI Collaboration in Data Annotation**

PI: Toby Li

2022; \$13,734

### **NVIDIA Academic Hardware Grant: Generating Immersive VR Scenes with Spatial Audio from Monaural 2D Videos**

PI: Toby Li; Student: Zheng Ning

2022; \$4,650 in equipment

### **NSF: Collaborative Research: SHF: Medium: Towards More Human-like AI Models of Source Code**

CCF-2211428

Lead PI: Collin McMillan (ND); Co-PI: Toby Li and Yu Huang (Vanderbilt University)  
2022-2026; \$1,295,880 (ND's share \$864,000; Li's credit \$432,000)

**Google Research Scholar Award: Effective Human-AI Collaboration with Data-Driven Models in UX Design**

PI: Toby Li  
2022-2023; \$60,000

**University of Notre Dame Asia Research Collaboration Grant: Creativity and Cultural Factors in Human-AI Co-Creation in Fiction Writing**

PI: Toby Li; Collaborator: Ray LC (City University of Hong Kong)  
2022-2023; \$9,835

**Google Cloud Research Credit Grant: Procedure Generalization in Interactive Task Learning**

PI: Toby Li  
2021-2022; \$5,000 in credits

**Google Cloud Research Credit Grant: Screen2Vec: A New Method for Embedding GUI Screens in Vector Spaces**

PI: Toby Li  
2020-2021; \$1,000 in credits

**Google Cloud Research Credit Grant: SUGILITE: A Multi-Modal Agent that Learns Tasks from Natural Language and Demonstrations**

PI: Toby Li  
2019-2020; \$2,000 in credits

## Relevant Research Experience

**Engineering Implementation Consultant  
Research Intern**

Microsoft Research, Redmond, WA  
*Mentor:* Dr. Oriana Riva

Aug. 2017–Dec. 2017  
May. 2017–Aug. 2017

**Research Assistant**

GroupLens Research, University of Minnesota

Jan. 2013–Aug. 2015

## Teaching Experience

**Instructor, CSE 40748/60748: Human-AI Collaborative Systems**

Department of Computer Science and Engineering, University of Notre Dame

Spring 2024

**Instructor, CSE 40424: Human-Computer Interaction**

Department of Computer Science and Engineering, University of Notre Dame

Spring 2023

**Instructor, CSE 60427: Human-Centered Computing Research**

Department of Computer Science and Engineering, University of Notre Dame

Fall 2021, 2022, 2023

**Teaching Assistant, 05-391 / 05-891: Designing Human-Centered Software**

Human-Computer Interaction Institute, Carnegie Mellon University

Spring 2019

**Teaching Assistant, 05-410 / 05-610: User-Centered Research & Evaluation**

Human-Computer Interaction Institute, Carnegie Mellon University

Fall 2018

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

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

Fall 2014



**Teaching Assistant, CSCI 2011: Discrete Structures of Computer Science**  
Department of Computer Science and Engineering, University of Minnesota

Fall 2013, Spring 2014

## Students Advised at Notre Dame

### Doctoral Students

<b>Ningzhi Tang</b> (Ph.D. in CSE)	2023–Present
<b>Chaoran Chen</b> (Ph.D. in CSE)	2022–Present
<b>Yuwen Lu</b> (Ph.D. CSE)	2021–Present
<b>Zheng Ning</b> (Ph.D. in CSE)	2021–Present
<b>Simret Araya Gebreegziabher</b> (Ph.D. in CSE)	2021–Present
<b>Zheng Zhang</b> (Ph.D. in CSE)	2021–Present

### Doctoral Thesis Committee

<b>Oghenemaro (Maro) Anuyah</b> (Ph.D. in CSE)	Expected Graduation in 2024
<b>Aakash Bansal</b> (Ph.D. in CSE)	Expected Graduation in 2024
<b>Gonzalo Martinez</b> (Ph.D. in CSE, now at John Deere)	Graduated in 2022
<b>Sakib Haque</b> (Ph.D. in CSE, now at Qualtrics)	Graduated in 2022

### Undergraduate Students

<b>Luke Cao</b> (B.S. in CS)	2023–2024
<b>Tori Banda</b> (B.S. in CS)	Summer 2023
<b>Ava DeCroix</b> (B.A. in CS)	2023
<b>Tommy Rozgonyi</b> (B.S. in CS)	2022
<b>Michael Bsales</b> (B.A. in CS)	2022
<b>Ryan Pairitz</b> (B.S. in CS)	2022
<b>Jerrick Ban</b> (B.S. in CS)	2022–2023
<b>Ziang Tong</b> (B.S. in CS)	2022–2023
<b>Victor Cox</b> (B.S. in CS, now at Capital One)	2021–2022
<b>Meng Chen</b> (B.S. in CS and Philosophy)	2021–Present

### Visiting Students

<b>Sangwook Lee</b> (Visiting M.S. Student from KAIST)	Summer 2023
<b>Weijun Li</b> (Visting M.S. Student from Zhejiang University)	Summer 2023
<b>Jie Gao</b> (Visiting Ph.D. Student from Singapore U. of Tech. and Design, now Postdoc at Singapore-MIT Alliance for Research and Technology)	Spring 2023
<b>Yuewen Yang</b> (NYU, now M.S. student at Cornell Tech)	Summer 2022
<b>Yihao Meng</b> (Xi'an Jiaotong University, now Ph.D. student at HKUST)	Summer 2022
<b>Chao Zhang</b> (Zhejiang University, now Ph.D. student at Cornell)	Summer 2022
<b>Xiaohang Tang</b> (Liverpool University, now Ph.D. student at Virginia Tech)	Summer 2022
<b>Ningzhi Tang</b> (SUSTech, now Ph.D. student at Notre Dame)	Summer 2022

## Students Mentored Prior to Notre Dame

<b>Tiffany Cai</b> (CMU, now at Google X) - <i>Worked on a new mobile keyboard for recording text entries in demonstration.</i>	Spring 2017
<b>Jeremy Wei</b> (CMU, now at Flatiron Health) - <i>Worked on identifying crucial actions in demonstrated scripts.</i>	Spring 2017
<b>Xiaohan Nancy Li</b> (CMU, now at Microsoft) - <i>Worked on representing and querying snapshots of mobile GUIs.</i>	Fall 2017
<b>Wenze Shi</b> (CMU, now at Facebook) - <i>Worked on extracting semantic entities from mobile GUIs.</i>	Spring 2018
<b>Wanling Ding</b> (CMU, now at Shopee) - <i>Worked on generating user friendly representations for demonstrated scripts.</i>	Spring 2018
<b>Marissa Radensky</b> (Amherst College, REU at CMU, now Ph.D. student at UW) - <i>Worked on supporting conditionals in programming by demonstration.</i>	Summer 2018
<b>Justin Jia</b> (CMU, now at Citadel) - <i>Worked on semantic parsing for concept instructions.</i>	Spring 2019
<b>Kirielle Singarajah</b> (CMU, now at Google) - <i>Worked on semantic parsing for concept instructions.</i>	Spring 2019
<b>Brandon Canfield</b> (Yale University, REU at CMU) - <i>Worked on enabling privacy-preserving sharing of end user developed scripts.</i>	Summer 2019
<b>William Timkey</b> (Cornell University, REU at CMU, now Ph.D. student at NYU) - <i>Worked crowd-sourced data collection for semantic parsers.</i>	Summer 2019
<b>Jingya Chen</b> (CMU, first position at MIT, now at Microsoft Research) - <i>Worked on multi-modal error handling for speech interfaces.</i>	Summer 2019–2020
<b>Lindsay Popowski</b> (Harvey Mudd, REU at CMU, now Ph.D. student at Stanford) - <i>Worked on the semantic embedding of GUI screens and components.</i>	Summer 2020
 <b>CRA 2021 Outstanding Undergraduate Researcher Award</b>	
<b>Vanessa Hu</b> (Harvard University, REU intern at CMU) - <i>Worked on the fuzzy lexicon matching and time expression parsing in semantic parsers.</i>	Summer 2020

## Selected Talks and Seminars

- [T.13] **Beyond “Thin Wrapper” in Human-AI Co-Creation**  
 Invited Talk at Adobe Research  
 Host: Cuong Nguyen and Ding Li  
 Virtual Visit, Nov. 28, 2023
- Invited Seminar at Singapore Management University  
 Host: Yong Wang  
 Singapore, SG. Dec. 11, 2023
- [T.12] **Human-AI Collaboration for Ambiguities, Uncertainties, and Evolving Objectives**  
 Invited Keynote at the *ICML 2023 Workshop on Artificial Intelligence & Human Computer Interaction*  
 Honolulu, HI. Jul. 29, 2023

- [T.11] **A Bottom-Up Approach to Empower Gig Workers against AI Inequality**  
Invited Seminar at HCI Summer Workshop at School of Information Studies, Syracuse University  
Host: EunJeong Cheon  
Virtual Visit, Aug. 4, 2022
- [T.10] **End User Empowerment through Human-AI Collaboration**  
Invited Seminar at HCI Group, Princeton University  
Host: Andrés Monroy-Hernández  
Virtual Visit, Jun. 17, 2022
- [T.9] **Human-AI Collaboration in Data Annotation**  
Invited Talk at Elevance Health/Anthem  
Host: Adarsh Ramesh  
Virtual Visit, Nov. 16, 2022  
  
Invited Talk at IBM Research Almaden  
Host: Lucian Popa and Dakuo Wang  
Virtual Visit, Apr. 22, 2022
- [T.8] **Screen2Vec: Semantic Embedding of GUI Screens and What They are Useful for**  
Invited Seminar at HCI Group, Stanford University  
Host: Michael Bernstein  
Virtual Visit, Feb. 22, 2021
- [T.7] **Interactive Systems for Configuring, Extending, and Developing AI Applications**  
Invited Talk at Apple Research  
Host: Jeff Nichols  
Virtual Visit, Mar. 8, 2021  
  
Invited Talk at HCI Lab, Hasso Plattner Institut  
Host: Patrick Baudisch  
Virtual Visit, Mar. 4, 2021  
  
Invited Talk at Sigma Research Seminar Series  
Host: Çağatay Demiralp  
Virtual Visit, Feb. 24, 2021  
  
Invited Talk at Microsoft Research Montréal  
Host: Adam Trischler  
Virtual Visit, Jan. 11, 2021  
  
Invited Talk at Google People + AI Research (PAIR) Seminar  
Host: Carrie Cai  
Virtual Visit, Oct. 13, 2020  
  
Invited Talk at IBM Research Cambridge  
Host: Casey Dugan  
Virtual Visit, Aug. 12, 2020
- [T.6] **Interactive Task Learning from GUI-Grounded Natural Language Instructions and Demonstrations**  
Invited Talk at Apple Research  
Host: Jeff Nichols  
Virtual Visit, Dec. 7, 2022  
  
Invited Talk at *the AAAI-20 Workshop on Intelligent Process Automation (IPA-20)*  
New York, NY. Feb. 7, 2020

- [T.5] **Machine Learning from Human Instruction: Every Person a Programmer**  
 Invited Talk at J.P. Morgan (*with Forough Arabshahi*)  
 Host: Sumitra Ganesh and Denis Kochedykov  
 New York, NY. May 24, 2019
- [T.4] **Teaching Intelligent Agents New Tricks: Natural Language Instructions plus Programming-by-Demonstration for Teaching Tasks**  
 Invited Talk at *Human Computer Interaction Consortium (HCIC '18)* (*with Brad Myers*)  
 Watsonville, CA. Jun. 25, 2018
- [T.3] **SUGILITE: A Multi-Modal Agent that Learns Tasks from Natural Language and Demonstrations**  
 Invited Demo at *the ACL 2020 Workshop on Natural Language Interfaces*  
 Seattle, WA. July 10, 2020
- Invited Demo at *the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2019)*  
 Pittsburgh, PA. Oct. 28, 2019
- Invited Lightning Talk at CMU HCII 25<sup>th</sup> Anniversary  
 Pittsburgh, PA. Oct. 25, 2019
- Invited Talk at Oath (formerly Yahoo!)  
 Sunnyvale, CA. May 30, 2018
- [T.2] **Atlasify – The Geography of Everything**  
 Invited Demo at *the 3M Science and Engineering Symposium*  
 St Paul, MN. Jun. 25, 2015
- Invited Demo at *the Social Media and Business Analytics Collaborative (SOBACO) Research Symposium*  
 Minneapolis, MN. May 14, 2015
- [T.1] **WikiBrain: Making Computer Programs Smarter with Knowledge from Wikipedia**  
 Invited Demo at *the Social Media and Business Analytics Collaborative (SOBACO) Research Symposium*  
 Minneapolis, MN. May 6, 2014.

## Invited Guest Lectures

### Human-AI Co-Creation

Fall 2023, Spring 2024

*CDT 30750 Generative AI in the Wild*

Host: John Behrens and Ranjodh Singh Dhaliwal

University of Notre Dame, Computing and Digital Technologies

### Interactive Task Learning

Spring 2023

*CSE 599H: Artificial Intelligence (AI) vs Intelligence Augmentation (IA)*

Host: Ranjay Krishna

University of Washington, Department of Computer Science and Engineering

### AI Inequality in Gig Work

Fall 2022

*HIST 30951: Just Wage Research*

Host: Dan Graff

University of Notre Dame, Department of History

### Human-AI Collaborative Systems

Spring 2022

*EECS 598: Human-AI Interaction and Systems*

Host: Anhong Guo

University of Michigan, Department of Computer Science and Engineering

**Human-AI Collaborative Systems**

Fall 2021

*CS 228 Human-Computer Interaction*

Host: Yuanyuan Feng

University of Vermont, Department of Computer Science

**Toolkits for Creating Conversational Interfaces**

Fall 2020

*05-830: Advanced User Interface Software*

Host: Brad Myers

Carnegie Mellon University, Human-Computer Interaction Institute

**Professional Service****Academic Service****Organizing Committee**

IUI 2026 General Chair

CHIWORK 2023 Program Chair

ACM CSCW 2023 Demo Chair

ACM UIST 2021 Web and Design Chair

**Workshop Organizer**

CHI 2024 Workshop on Computational Approaches for User Interfaces

CHI 2023 Workshop on Computational Approaches for User Interfaces

IUI 2023 Workshop on Designing for Safety in Human-AI Interactions (SHAI 2023)

CHI 2022 Workshop on Computational Approaches for User Interfaces

**Special Interest Group (SIG) Organizer**

CSCW 2023 SIG on Designing for AI-Powered Social Computing Systems

CSCW 2023 SIG on Shaping the Emerging Norms of Using LLMs in Social Computing Research

**Associate Chair (AC) of Program Committee**

ACM UIST 2024

ACM CHI 2024

ACM CHI 2023

ACM CHI 2022

ACM UIST 2021

ACM CHI 2020 Late Breaking Work Track

ACM CHI 2019 Late Breaking Work Track

**Member of Program Committee**

EMNLP 2022 Workshop on Data Science with Human in the Loop (DaSH 2022)

EMNLP 2021

KDD 2021 Workshop on Data Science with Human in the Loop (DaSH 2021)

ACL 2021 Workshop on NLP for Programming (NLP4Prog)

AAAI 2020 Workshop on Intelligent Process Automation (IPA 20)

**Session Chair**ACM CSCW 2023 Session on *Human-AI Collaboration*ACM CHI 2023 Session on *Tools for Data Scientists and Literature Reviews*CHIWORK 2022 Session on *Remote Work*ACM CHI 2022 Session on *Interacting with Data* and Journal Session on *Context and the Interface*ACM UIST 2021 Session on *Alternative Programming*ACM CHI 2019 Session on *Conversational Interactions*

**Conference Reviewer**

**ACM CHI** (2017-2024), **ACM UIST** (2017-2023), **ACM CSCW** (2018-2023), **ACL** (2021), **ACM DIS** (2018-2021), **ACM MobileHCI** (2018-2020), **ACM TEI** (2018), **ACM SIGCSE** (2018), **ACM CHI PLAY** (2019)

 Received “special recognitions” for outstanding reviews for ACM UIST 2017, ACM CHI 2018, ACM DIS 2020, ACM CHI 2021 (twice), ACM UIST 2022, and ACM CSCW 2022.

**Journal Reviewer**

**ACM TOCHI** (2021-2024), **ACM IMWUT** (2017-2020), **ACM TOSEM** (2022-2023), **IEEE TMC** (2018, 2022), **IEEE TSC** (2020), **IEEE Pervasive** (2018-2019), **IJGIS** (2017), **IEEE Access** (2019-2020), **Collective Intelligence** (2023)

**Grant Proposal Reviewer/Panelist**

**Panelist**, National Science Foundation (NSF) CISE (2022)

**External Expert Referee**, Italian Ministry of University and Research (MUR) (2022)

**Reviewer**, Indiana Clinical and Translational Sciences Institute (CTSI) (2021)

**Departmental and Community Service**

**Committee Member**, Notre Dame CSE Diversity, Equity, and Inclusion (DEI) Committee (2022-2024)

**Committee Member**, Lucy Family Institute Graduate Scholar Selection Committee (2022)

**Faculty Leader**, Notre Dame’s Participation in TAPIA Conference of Diversity in Computing (2021-2024)

**Committee Member**, Notre Dame CSE Ph.D. Admissions Committee (2021-2024)

**Member**, CMU HCII Anti-Racism Work Group (2020-2021)

**Coordinator**, CMU HCII Open House Faculty Research Talks (2020-2021)

**Committee Member**, CMU HCII Faculty Lunch Organization Committee (2019-2020)

**Committee Member**, CMU HCII Ph.D. Student Lounge Committee (2019-2020)

**Committee Member**, CMU HCII Ph.D. Admissions Committee (2018-2019)

**Student Volunteer**, ACM IUI 2019, ACM SIGSPATIAL 2014

**Languages**

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

**Technical Skills**

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

**UX Skills:** Qualitative Research, Quantitative Research, Experiment Design, Data Analysis, UX Design

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