

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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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

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

Ph.D. in Human-Computer Interaction 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	2021
B.S. with Distinction in Computer Science University of Minnesota, <i>Minneapolis, MN</i> Department of Computer Science and Engineering <i>Advisor:</i> Brent J. Hecht	2015

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.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 Kneareem, 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[@], Christof Lutteroth, **Toby Jia-Jun Li**, Jeffery 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[@], Jeffery 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[@], 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**

Aug. 2017–Dec. 2017

Research Intern

May. 2017–Aug. 2017

Microsoft Research, Redmond, WA

Mentor: Dr. Oriana Riva**Research Assistant**

Jan. 2013–Aug. 2015

GroupLens Research, University of Minnesota

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

Spring 2024

Department of Computer Science and Engineering, University of Notre Dame

Instructor, CSE 40424: Human-Computer Interaction

Spring 2023

Department of Computer Science and Engineering, University of Notre Dame

Instructor, CSE 60427: Human-Centered Computing Research

Fall 2021, 2022, 2023

Department of Computer Science and Engineering, University of Notre Dame

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

Spring 2019

Human-Computer Interaction Institute, Carnegie Mellon University

Teaching Assistant, 05-410 / 05-610: 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 Advised at Notre Dame

Doctoral Students

Ningzhi Tang (Ph.D. in Computer Science and Engineering)	2023–Present
Chaoran Chen (Ph.D. in Computer Science and Engineering)	2022–Present
Yuwen Lu (Ph.D. in Computer Science and Engineering)	2021–Present
Zheng Ning (Ph.D. in Computer Science and Engineering)	2021–Present
Simret Araya Gebreegzabher (Ph.D. in Computer Science and Engineering)	2021–Present
Zheng Zhang (Ph.D. in Computer Science and Engineering)	2021–Present

Doctoral Thesis Committee

Oghenemaro (Maro) Anuyah (Ph.D. in Computer Science and Engineering)	Expected Graduation in 2024
Aakash Bansal (Ph.D. in Computer Science and Engineering)	Expected Graduation in 2023
Gonzalo Martinez (Ph.D. in Computer Science and Engineering)	Graduated in 2022
Sakib Haque (Ph.D. in Computer Science and Engineering)	Graduated in 2022

Undergraduate Students

Tori Banda (B.S. in Computer Science)	Summer 2023
Luke Cao (B.S. in Computer Science)	Summer 2023
Ava DeCroix (B.A. in Computer Science)	2023
Tommy Rozgonyi (B.S. in Computer Science)	2022
Michael Bsales (B.A. in Computer Science)	2022
Ryan Pairitz (B.S. in Computer Science)	2022
Jerrick Ban (B.S. in Computer Science)	2022–2023
Ziang Tong (B.S. in Computer Science)	2022–2023
Victor Cox (B.S. in Computer Science)	2021–2022
Meng Chen (B.S. in Computer Science)	2021–Present

Visiting Students

Sangwook Lee (Visiting Graduate Student from KAIST)	Summer 2023
Weijun Li (Visiting Graduate Student from Zhejiang University)	Summer 2023
Jie Gao (Visiting Graduate Student from Singapore U. of Tech. and Design)	Spring 2023
Chao Zhang (Zhejiang University, now Ph.D. student at Cornell)	Summer 2022
Xiaohang Tang (Liverpool University, now Ph.D. student at Virginia Tech)	Summer 2022
Ningzhi Tang (SUSTech, now Ph.D. student at Notre Dame)	Summer 2022

Students Mentored Prior to Notre Dame

Tiffany Cai (CMU, now at Google X) - <i>Worked on a new mobile keyboard for recording text entries in demonstration.</i>	Spring 2017
Jeremy Wei (CMU, now at Flatiron Health) - <i>Worked on identifying crucial actions in demonstrated scripts.</i>	Spring 2017

Xiaohan Nancy Li (CMU, now at Microsoft) - <i>Worked on representing and querying snapshots of mobile GUIs.</i>	Fall 2017
Wenze Shi (CMU, now at Facebook) - <i>Worked on extracting semantic entities from mobile GUIs.</i>	Spring 2018
Wanling Ding (CMU, now at Shopee) - <i>Worked on generating user friendly representations for demonstrated scripts.</i>	Spring 2018
Marissa Radensky (Amherst College, REU at CMU, now Ph.D. student at UW) - <i>Worked on supporting conditionals in programming by demonstration.</i>	Summer 2018
Justin Jia (CMU, now at Citadel) - <i>Worked on semantic parsing for concept instructions.</i>	Spring 2019
Kirielle Singarajah (CMU, now at Google) - <i>Worked on semantic parsing for concept instructions.</i>	Spring 2019
Brandon Canfield (Yale University, REU at CMU) - <i>Worked on enabling privacy-preserving sharing of end user developed scripts.</i>	Summer 2019
William Timkey (Cornell University, REU at CMU, now Ph.D. student at NYU) - <i>Worked crowd-sourced data collection for semantic parsers.</i>	Summer 2019
Jingya Chen (CMU, first position at MIT, now at Microsoft Research) - <i>Worked on multi-modal error handling for speech interfaces.</i>	Summer 2019–2020
Lindsay Popowski (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
🏆 CRA 2021 Outstanding Undergraduate Researcher Award	
Vanessa Hu (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 Keynote at Adobe Research
 Host: Cuong Nguyen and Ding Li
 Virtual Visit, Nov. 28, 2023
- Invited Talk 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 Talk 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 Talk 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 Talk 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 25th 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

- | | |
|---|-------------|
| Interactive Task Learning
<i>CSE 599H: Artificial Intelligence (AI) vs Intelligence Augmentation (IA)</i>
Host: Ranjay Krishna
University of Washington, Department of Computer Science and Engineering | Spring 2023 |
| AI Inequality in Gig Work
<i>HIST 30951: Just Wage Research</i>
Host: Dan Graff
University of Notre Dame, Department of History | Fall 2022 |
| Human-AI Collaborative Systems
<i>EECS 598: Human-AI Interaction and Systems</i>
Host: Anhong Guo
University of Michigan, Department of Computer Science and Engineering | Spring 2022 |
| Human-AI Collaborative Systems
<i>CS 228 Human-Computer Interaction</i>
Host: Yuanyuan Feng
University of Vermont, Department of Computer Science | Fall 2021 |
| Toolkits for Creating Conversational Interfaces
<i>05-830: Advanced User Interface Software</i>
Host: Brad Myers
Carnegie Mellon University, Human-Computer Interaction Institute | Fall 2020 |

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 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 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