Tiffany Wenting Li

wenting7@illinois.edu ♦ [Personal Website](#) ♦ [Google Scholar Profile](#)

EDUCATION

Ph.D. Candidate, Computer Science **08/2018 ~ Present (Expected 07/2024)**
University of Illinois at Urbana-Champaign (UIUC) *Urbana-Champaign, United States*
- **Advisors:** Karrie Karahalios, Hari Sundaram
- **Research areas:** Human-computer interaction (HCI), Human-centered AI, Education
- **Thesis topic:** Impact Assessment of AI Errors in NLP-driven Educational Systems in STEM

B.A., Double Majors in Mathematics & Economics **08/2012 ~ 05/2016**
Cornell University *Ithaca, United States*
- **Cumulative GPA:** 3.91/4.3; **Major GPA:** 3.99/4.3

RESEARCH INTERESTS

As an HCI + human-centered AI + education researcher, I aim to create human-centered AI educational systems that enhance learning, respect user preferences, and ensure fairness. AI can potentially make personalized education more accessible and efficient. However, these systems can fail to reach their full potential, cause harm, and even widen learning disparities if not developed using a human-centered approach. Therefore, **I conduct mixed-methods human studies, create frameworks, and develop systems and machine learning (ML) models** to develop, evaluate, and improve human-centered AI educational systems.

RESEARCH METHODOLOGIES

Mixed methods (survey & interview), Bayesian statistics, grounded-theory analysis, causal inference, human-subject experiment, framework development, applied machine learning, system building.

HONORS, AWARDS & GRANTS

- **Microsoft Research Accelerate Foundation Models Research Program** **2023**
  Received grant funding support for the project proposal on "Challenges and Benefits of AI Errors for Learners in Conversational Q&A Systems."
- **Google Ph.D. Fellowship** **2022 ~ Present**
  Received Google Ph.D. fellowship in Human-Computer Interaction and a secondary area in Algorithmic Fairness with the research proposal topic of "Addressing imperfection and opacity in AI-powered educational systems."
- **Outstanding Teaching Assistant Award** **2021**
  Selected as one of the eight recipients in the department for Spring 2021.
- **Graduate College Conference Participation Award** **2021**
  Selected as one of the five recipients in the computer science department at UIUC.
- **Saburo Muroga Endowed Fellowship** **2018**
  For outstanding graduate students in CS at UIUC; Selected as one of the five recipients.

RESEARCH TOPICS & PUBLICATIONS (* = *Equal contribution*)

Topic 1: Identify Learners' Perceptual Challenges with Imperfect, Opaque AI Educational Systems

What are learners' perceptions, attitudes, and mental models towards an imperfect and opaque AI educational system, and why? I have answered this question regarding (1) a short-answer autograding system and (2) a free-hand sketching feedback system. I identified various human-AI interaction challenges and proposed deployment guidelines.

[1] S. Hsu*, **T.W. Li***, Z. Zhang, M. Fowler, C. Zilles, K. Karahalios. *Attitudes Surrounding an Imperfect AI Autograder.* ACM Conference on Human Factors in Computing Systems Conference (CHI), 2021. [Acceptance Rate: 26.3%]

[2] **T.W. Li,** Z. Xiao, M. H. Goldstein, M. L. Philpott, B. Woodard. *Evaluating an Intelligent Sketching Feedback Tool for Scalable Spatial Visualization Skill Training (work-in-progress).* ASEE Annual Conference, 2021.

Topic 2: Evaluate The Learning Impact of AI Errors in NLP-driven Educational Systems in STEM

How do AI errors in NLP-based educational systems impact learning, and why? Do some learners get affected more? I perform empirical evaluations and propose a framework for impact assessment.

[3] **T.W. Li**, H. Sundaram, K. Karahalios. *Towards an Evaluation Framework for Auditing the Learning Impact of Errors in Natural Language Responses from STEM Educational Systems.* [In progress]

[4] **T.W. Li***, S. Hsu*, M. Fowler, Z. Zhang, C. Zilles, K. Karahalios. *Am I Wrong, or is the Autograder Wrong? Effects of AI Grading Mistakes on Learning.* Accepted to ACM Conference on International Computing Education Research (ICER), 2023. [Acceptance Rate: 21%]

[5] B. Bhavya, S. Chen, Z. Zhang, **T.W. Li,** C. Zhai, L. Angrave, Y. Huang. *Exploring collaborative caption editing to augment video-based learning.* Educational technology research and development (2022): 1-25.

Topic 3: Develop Systems for Training Spatial Visualization Skills at Scale

How do we provide personalized and enjoyable spatial visualization training at scale? I developed a personalized feedback system for free-hand sketching problems and an online spatial visualization training platform deployed in a college classroom.

[6] **T.W. Li**, L. Paquette. *Erroneous Answers Categorization for Sketching Questions in Spatial Visualization Training.* International Educational Data Mining Society (EDM), 2020. [Acceptance Rate: 30.6%]

[7] B.S. Woodard, **T.W. Li,** Z. Xiao, M. H. Goldstein, M. L. Philpott. *Work in Progress: Spatial Visualization Assessment and Training in the Grainger College of Engineering at the University of Illinois.* ASEE Illinois-Indiana Regional Conference, 2021.

[8] H. Wauck, B. Woodard, Z. Xiao, **T.W. Li**, B. Bailey. *A Data-Driven, Player-Centric Approach to Evaluating Spatial Skill Training Games.* Proceedings of the Annual Symposium on Computer-Human Interaction in Play (CHI Play), 2020. [Acceptance Rate: 29.45%] ***Honorable Mention Award***

Topic 4: Address The Unique Needs and Challenges for Scaling Non-STEM Education

Unlike many STEM courses, non-STEM courses tend to encourage introspection, critique, and subjective interpretation. Currently, however, large and online non-STEM courses are often taught similarly to STEM courses. How may AI help change the status quo? I performed user-centered ideations with stakeholders and proposed six future research directions.

[9] **T.W. Li**, K. Karahalios, H. Sundaram. *"It's all about conversation:" Challenges and Concerns of Faculty and Students in the Arts, Humanities, and the Social Sciences about Education at Scale.* ACM Conference on Computer Supported Cooperative Work (CSCW), 2020.

Topic 5: Non-education-related Research

I have collaborated on research across various topics outside of the education domain, including voting, conversational agents, and social network analysis.

[10] B.F. Farkhad, **T.W. Li,** H. Dev, M.S. Chan, D. Albarracin, H. Sundaram. *Latent Homophily or Social Influence? An Empirical Analysis of Information Diffusion in Social Media Networks.* In submission to Nature Communications.

[11] Z. Xiao, **T.W. Li,** K. Karahalios, H. Sundaram. *Inform the uninformed: Improving Online Informed Consent Reading with an AI-Powered Chatbot.* Accepted to ACM Conference on Human Factors in Computing Systems Conference (CHI), 2023.

[12] T. Cheng*, **T.W. Li***, Y. Chou, K. Karahalios, H. Sundaram. *"I can show what I really like.": Eliciting Preferences via Quadratic Voting.* ACM Conference on Computer Supported Cooperative Work (CSCW), 2021.

TEACHING & MENTORING EXPERIENCE

- **Co-instructor, Social Visualization, UIUC**   **Spring 2021**
  - Designed and led project presentation sessions.
  - Critiqued and graded students' visualization projects.
  - Designed data analysis and machine learning assignments.
- **Teaching Assistant, Spatial Visualization, UIUC**   **Fall 2019, Fall 2020**
  - Developed and maintained an online spatial visualization training platform that utilized second-chance-testing and formative feedback.
- **Teaching Assistant, Probability and Statistics for Computer Science, UIUC**   **Spring 2020**
  - Designed and taught discussion sessions from scratch.
  - Created exams on topics in probability, statistics, and machine learning.
- **Mentor**
  - Owen Xinjian Zhang, Undergraduate, UIUC; now M.S. student at Princeton University
    For his senior thesis
  - Zhilin Zhang, M.S. Student, UIUC; now a Ph.D. student at the University of Oxford
    In multiple papers related to educational technology
  - "Mentoring Undergraduates in Science and Engineering" Program, UIUC, 2021 - 2022
    Taught HCI research fundamentals

SERVICE

Reviewer

- Human Factors in Computing Systems Conference (CHI), 2024, 2023, 2021
- ACM Conference on Computer Supported Cooperative Work (CSCW), 2022
- ACM Special Interest Group on Computer Science Education (SIGCSE), 2020 – 2022

Organizer

- Just Infrastructure speaker series, UIUC, Fall 2021

Volunteer

- Teacher at SAIL@Illinois CS, 2023
  Taught an introduction to HCI session to local high school students
- Student volunteer at CHI 2022

WORK EXPERIENCE

Mixed-methods UX Researcher Intern   **05/2022 ~ 08/2022**
Meta Platforms, Inc.   *Menlo Park, United States*
- Conducted a mixed-methods study that involved interviewing director-level employees around the globe and proposing automation and policy recommendations to unblock the bottleneck of insufficient interviewer trainers.

Technology Advisory Staff, Financial Service Office   **09/2016 ~ 06/2018**
Ernst & Young, LLP   *New York, United States*
- Won 5 Bravo Awards and received top rating (top 5-10% of the class) in the first year.
- Created deliverables and presented at client meetings in multiple projects related to model validation and enterprise-level data quality control.

LANGUAGES & INTERESTS

Spoken languages: Mandarin (native), Cantonese (native), English (full professional proficiency), Japanese (limited working proficiency)

Interests: Racquet sports, dog training, martial arts, piano