Melissa Chen

PhD candidate in human-computer interaction and computing education
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Summary

I study the design of sociotechnical systems to support novice computing students' self-efficacy, motivation, and learning. I explore how to (1) support students in making more accurate evaluations of their programming abilities through both AI-based tools and teaching practices in university-level computing classes and (2) foster social learning through technology-facilitated knowledge sharing in culturally-relevant computing education for youth. I am an interdisciplinary researcher with formal training as a computer scientist as well as substantial background in the learning sciences; in my work, I leverage theories and methods from design-based research, human-computer interaction, computing education, and the learning sciences.

Education

Northwestern University — Evanston, IL, USA
PhD in Computer Science, Cognitive Science Certificate — *Sept 2022 – (expected) June 2028*
Studying human-computer interaction and computing education, advised by Dr. Eleanor O'Rourke in the Delta Lab

University of Illinois at Urbana-Champaign — Urbana, IL, USA
BS in Computer Science, minor in Mathematics — *Aug 2018 – May 2022*
Graduated with Highest Honors & as a Distinguished Chancellor's Scholar and James Scholar; Tau Beta Pi

Publications

Premier conferences in computer science (e.g., ICER, etc.) are highly-selective, archival venues (e.g., ICER typically has a 20-30% acceptance rate). Undergraduate authors I mentored on the project are starred.*

Peer-reviewed conference papers

[C6] Brett Wortzman, **Melissa Chen**, Miya Natsuhara, Eleanor O'Rourke. 2026. Choosing Their Own Way: Guided Self-Placement for Students in an Introductory Programming Sequence. *ACM Technical Symposium on Computer Science Education (SIGCSE TS 2026). Experience Report Track.* [to appear]

[C5] Stephanie Yang, **Melissa Chen**, Bertrand Schneider. 2025. Navigating Appropriate Help-seeking with LLMs: Associations with Motivation and Beliefs in a CS Course. *Koli Calling International Conference on Computing Education Research (Koli Calling 2025).*

[C4] Yinmiao Li, **Melissa Chen**, Ayse Hunt, Michael Horn, Eleanor O'Rourke. 2025. Exploring Students' Perceptions of Contextualized Computing in an Introductory Computing Science Course for Non-majors. *International Conference of the Learning Sciences (ICLS 2025).*

[C3] Kristin Fasiang, **Melissa Chen**, Eleanor O'Rourke. 2025. The Interrelated Nature of Belonging and Self-Assessments in Computing Students' Decisions to Persist. *International Conference of the Learning Sciences (ICLS 2025). Posters Track.*

[C2] **Melissa Chen**, Yinmiao Li, Eleanor O'Rourke. 2024. Understanding the Reasoning Behind Students' Self-Assessments of Ability in Introductory Computer Science Courses. *ACM Conference on International Computing Education Research (ICER 2024).* **Winner: Best Paper Award (top 1/36)**

[C1] Yinmiao Li, **Melissa Chen**, Ayse Hunt, Haoqi Zhang, and Eleanor O'Rourke. 2024. Exploring the Interplay of Metacognition, Affect, and Behaviors in an Introductory Computer Science Course for Non-Majors. *ACM Conference on International Computing Education Research (ICER 2024).*

Editorially-reviewed posters and doctoral consortia (archival)

[E2] **Melissa Chen**. 2025. Designing to Support Accurate Self-Assessments of Programming Ability. *ACM Conference on International Computing Education Research (ICER 2025).*

[E1] **Melissa Chen**, Eleanor O'Rourke. 2023. Designing a Real-Time Intervention to Address Negative Self-Assessments While Programming. *ACM Conference on International Computing Education Research (ICER 2023).*

Other posters

[O6] **Melissa Chen**, Eleanor O'Rourke. 2025. Towards an AI system for support student self-assessments of programming ability. *Symposium on AI, Education, and the Learning Sciences*.

[O5] **Melissa Chen**, Eleanor O'Rourke. 2023. Towards a real-time intervention to encourage beginners to develop accurate beliefs about programming ability. *CRA-WP Grad Cohort for Women*.

[O4] **Melissa Chen**, Eleanor O'Rourke. 2022. Towards a real-time intervention to encourage beginners to develop accurate beliefs about programming ability. *Lambert Conference on the Future of Human-Computer Interaction and Design*.

[O3] **Melissa Chen**, Wendy Shi, Brian Bailey. 2022. Disparities by Gender in Self and Peer Evaluations. *University of Illinois Undergraduate Research Symposium*.

[O2] **Melissa Chen**, Maxwell Jong. 2022. Producing Training Data for Supervised Learning on Satellite Data. *National Center for Supercomputing Applications Poster Session*.

[O1] **Melissa Chen**, Kejie Zhao, Yizhi Huang. 2021. Crop Field Grassway Segmentation Using NAIP Satellite Imagery. *National Center for Supercomputing Applications Poster Session*.

Selected Awards and Honors

Research

National Science Foundation Graduate Research Fellowship (NSF GRFP) 2024 – 2029
Three years of funding over five years awarded to outstanding graduate students in STEM

ACM ICER 2024 Best Paper Award 2024
Awarded to one paper per year by the ICER awards committee. Top paper out of 36 at the conference.

Northwestern HCI+D Design Research Cluster Fellowship 2023 – 2024
Two quarters of funding awarded to PhD students to develop design research skills with mentorship from two faculty mentors and a senior fellow

ACM-W Research Computer Science Conference Scholarship 2023
Funding to attend SIGCSE Technical Symposium 2023

Todd M. and Ruth Warren and the Chookaszian Family Fellowship 2022 – 2024
Two-year supplemental fellowship for computer science students

Northwestern Incoming Cognitive Science Fellowship 2022 – 2023
One year of funding awarded to six first-year PhD students in cognitive science-related fields

Teaching and Service

Northwestern CS Ambassador Award 2025
Awarded for service to the department community as a member of the CS PhD Advisory Council

Northwestern CS Student Hero Award 2024
Awarded for service to the department community

Illinois CS Course Assistant Award 2020
Nominated by course professor and selected by the department based on service as an undergraduate course assistant

Talks

[T6] Practical insights into supporting novice programmers' self-assessments of programming ability in the LLM era. *CS Student Seminar Series*. November 2025.

[T5] Co-designing Interventions to Support Students' Self-Assessments of Ability in Introductory Computer Science Courses. *Qualifying Exam Presentation*. November 2024.

[T4] Understanding the Reasoning Behind Students' Self-Assessments of Ability in Introductory Computer Science Courses. *Guest Speaker, Undergraduate Research Track Course*. October 2024.

[T3] Understanding the Reasoning Behind Students' Self-Assessments of Ability in Introductory Computer Science Courses. *Conference Talk, ACM ICER 2024.* August 2024.

[T2] Towards Scalable Interventions for CS1 Student Self-efficacy. *Design Research Cluster Fellowship Final Presentation, Northwestern University Center for Human-Computer Interaction and Design.* April 2024.

[T1] Designing a Real-Time Intervention to Address Negative Self-Assessments While Programming. *Lightning Talk Track, ACM ICER 2023.* August 2023.

Research Experience

Delta Lab, Northwestern University Evanston, IL, USA
PhD Researcher, advised by Dr. Eleanor O'Rourke *Sept 2022 – Present*

- Led the design and development of an expert system (AI)-based, in-situ intervention to support students' programming processes and self-efficacy [E2] [E1] [O6] [O5] [O4] [T1]

- Organized co-design workshop with introductory computing educators and students to understand design space for self-efficacy interventions in classrooms [T5] [T2]
- Conducted longitudinal, qualitative data collection and analysis to understand students' reasoning for their self-assessments of programming ability [C2] [T5] [T4] [T3]
- Designed knowledge-sharing features of an educational programming language platform based on outcomes of a co-design workshop with youths about their computing learning experiences
- Collaborated cross-institutionally to understand students' self-perceptions and motivations in computing education [C6] [C5]
- Mentored undergraduate researcher in conceptualizing, running, and analyzing survey studies about student self-assessments when using LLMs

ORCHID Lab, University of Illinois at Urbana-Champaign Urbana, IL, USA
Undergraduate Researcher, advised by Dr. Brian Bailey *Aug 2021 – May 2022*

- Designed data visualizations and conducted statistical testing to understand disparities in students' self and peer evaluations and connected results to theories from CSCW and sociology research [T4]

National Center for Supercomputing Applications Urbana, IL, USA
Undergraduate Research Intern, advised by Dr. Kaiyu Guan *Jan 2021 – May 2022*

- Experimented with how data qualities (e.g., color vs. grayscale) impacted model classification accuracy for streetview images of crop field tillage [O2]
- Implemented and tested a novel approach using unsupervised clustering to segment satellite images of crop fields into crop and non-crop types to use as training data for a supervised model [O2] [O1]

Teaching and Mentoring Experience

Mentorship

Stephanie Rissmiller, *Cognitive Science, Northwestern University* Jan 2025 – Present
Understanding student self-assessments of programming ability while using LLMs and throughout the undergraduate experience

Teaching

Graduate Teaching Assistant (Northwestern University)

- CS 401: Introduction to Graduate Studies (Fall 2024)

Undergraduate Course Assistant (University of Illinois)

- CS 233: Computer Architecture (Spring 2020, Fall 2020, Spring 2021, Fall 2021, Spring 2022)
- CS 196: Freshman Honors (Spring 2019, Fall 2019)

Volunteer Teacher

- Fifth Grade Computer Science at Willard Elementary School, Evanston, IL (Winter 2025, Spring 2025)

Service

Paper Reviewing and Student Volunteering

Paper Reviewer: ACM CHI 2026, ISLS 2025

Student Volunteer: ACM ICER 2023, ACM IDC 2023, ACM SIGCSE TS 2023

Selected Institutional Service (Leadership)

Computer Science PhD Advisory Council (NU)
Board Member *2023 – Present*

Graduate Women in Computing (NU)
Supporting board member *2026 – Present*
Co-chair *2024 – 2025*
Co-organizer *2022 – 2024*

Graduate Society of Women Engineers (NU)
Outreach Chair *2024 – 2025*
Publicity Chair *2023 – 2024*

PhD Student Visit Day & Orientation (NU), *Student Committee Member* *2023 – Present*

CS Education Reading Group (NU), *Co-founder & Co-organizer* *2023*

Girls Who Code (UIUC)
Curriculum Planning Co-lead *2022*
Workshop Facilitator *2019 – 2022*

CS Student Ambassador / Research Scholars (UIUC), *Scholar* *2021 – 2022*

Women in Computer Science (UIUC)
Growth (Organizational Development) Chair *2021 – 2022*
Explorations (Technical Workshop, Projects, and Hackathon) Co-Chair *2020 – 2021*

Women in Engineering (UIUC), *Orientation CS Department Lead Mentor* *2021*

Reflections | **Projects Student-Run Tech Conference (UIUC)**, *Conference Content Co-chair* *2020*

HackIllinois Student-Run Open Source Hackathon (UIUC), *Co-director* *2019 – 2020*

Professional Experience

Northwestern – Evanston Township High School Partnership Office Evanston, IL, USA
Graduate Engagement Opportunities Program Practicum Student *Mar 2024 – June 2024*

- Conducted focus groups and analyzed qualitative data to elevate student voices and experiences as a part of program evaluation for the Women in STEM (WiSTEM) and Women in Engineering (WiENG) student clubs
- Planned and executed leadership summit to support interpersonal connection, big-picture brainstorming, and conversations about identity in STEM for WiSTEM and WiENG student leaders
- Connecting Northwestern faculty and ETHS teachers towards developing more inclusive and supportive computing curricula

Lyft Remote
Software Engineering Intern & Lyftern Advisory Council Member, Lyft Pink & Memberships Team *May 2022 – Aug 2022*

- Redesigned existing framework to produce faster, consistent results to improve the user and developer experience
- Presented design documents and presentations to communicate project plans and outcomes to cross-functional stakeholders
- Co-coordinated two projects for interns to network across locations and practice presentation skills and provided input on intern programming

Software Engineering Intern, Integrity Team *May 2021 – Aug 2021*

- Leveraged existing infrastructure to create a P0 version of a feature to put Lyft in line with card network expectations
- Collaborated with cross-functional partners in analytics, data science, product, operations, and engineering to finalize implementation details and understand impacts of designs

Facebook Remote
Software Engineering Intern, Privacy Infrastructure Team *May 2020 – Aug 2020*

- Developed a new framework to test feature extractors used to detect user-identifiable information and created an intuitive user interface to expedite feature extractor development and decrease experiment runtime by half