# Yinmiao Li

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PhD candidate in learning sciences, human-computer interaction and computing education

## Summary

As a human-computer interaction and learning sciences researcher, my research centers around understanding the connection between metacognition, emotion, and motivation in introductory computing education. I explore how to build sociotechnical systems to support students in overcoming overwhelming emotional and metacognitive experiences while programming through teaching emotional and metacognitive regulation strategies, as well as building non-judgmental learning environment.

## Education

- **Northwestern University** *Sept 2022 - present*
  *PhD in Computer Science and Learning Sciences* Evanston, IL, USA
  - Studying human-computer interaction and computing education, advised by Dr. Eleanor O'Rourke in the Delta Lab and Dr. Michael Horn in the TIDAL Lab
- **Carnegie Mellon University** *Sept 2020 - May 2022*
  *Master of Science in Educational Technologies and Applied Learning Sciences* Pittsburgh, PA, USA
  - Studying human-computer interaction and learning sciences
  - Conducting research in social programmable robot advised by Dr. Angela Stewart and Dr. Amy Ogan, and in creative learning domains advised by Prof. Marti Louw, and Dr. Daragh Byrne
  - UX Research Lead in Capstone project collaborating with Scholastic to support striving readers from grade school
- **New York University, Shanghai** *Sept 2016 - May 2020*
  *Bachelor of Science in Interactive Media Arts, Minor in Computer Science* Shanghai | Abu Dhabi | New York
  - Awarded Major Honors in Interactive Media Arts
  - Awarded Cum laude
  - Dean's Honor List: Fall 2017 - Spring 2018, Fall 2018 - Spring 2019, Fall 2019 - Spring 2020

## Publications

C=Conference, J=Journal, S=In Submission, P=Poster or work in progress, O=Non-Archival

**[S.4]** Lexie Zhao, John Chen, **Yinmiao Li**, Janet Xie, Michael Horn. (2026). Manuscript submitted for proceedings of *International Journal of Child-Computer Interaction*.

**[S.3]** **Yinmiao Li**. (2026). Doctoral Consortium manuscript submitted for proceedings of the *2026 International Conference of Learning Sciences*.

**[S.2]** Lexie Zhao, **Yinmiao Li**, Ting Pan, Michael Horn. (2026). Manuscript submitted for proceedings of the *2026 International Conference of Learning Sciences*.

**[C.8]** **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**. In *Proceedings of the 19th International Conference of the Learning Sciences-ICLS 2025*, pp. 592-600. *International Society of the Learning Sciences*. 2025. DOI: 10.22318/icls2025.548273

**[O.1]** Lexie Zhao, **Yinmiao Li**, John Chen, Michael Horn. (2025). Balancing Facilitation and Exploration: Analyzing Visitor Interactions with a Medical Patient Simulator in a Science Museum. *AERA Annual Meeting 2025*.

**[C.7]** **Yinmiao Li** , Melissa Chen, Ayse Hunt, Haoqi Zhang, Eleanor O'Rourke. (2024). **Exploring the interplay of metacognition, affect, and behaviors in an introductory computer science course for non-majors**. In *Proceedings of the 2024 ACM Conference on International Computing Education Research-Volume 1*, pp. 27-41. 2024/8/12. DOI: 10.1145/3632620.3671119

**[C.6]** Melissa Chen, **Yinmiao Li**, Eleanor O'Rourke. (2024). **Understanding the Reasoning Behind Students' Self-Assessments of Ability in Introductory Computer Science Courses**. In *Proceedings of the 2024 ACM Conference on International Computing Education Research-Volume 1*, pp. 1-13. 2024/8/12. DOI: 10.1145/3632620.3671094 **Winner: Best Paper Award (top 1/36)**

**[C.5]** John Chen, Lexie Zhao, **Yinmiao Li**, Zhennian Xie, Uri Wilensky, Michael Horn. (2024). **"Oh My God! It's Recreating Our Room!" Understanding Children's Experiences with A Room-Scale Augmented Reality Authoring Toolkit**. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*. 2024/5/11. DOI: 10.1145/3613904.364204

**[C.4]** **Yinmiao Li** , Haoqi Zhang, Eleanor O'Rourke. (2024). **The undervalued disciplinary and emotional support provided by teaching assistants in introductory computer science courses**. In *Proceedings of the 18th International Conference of the Learning Sciences-ICLS 2024*, pp. 1498-1501. International Society of the Learning Sciences. 2024/6/10. DOI: 10.22318/icls2024.614567

**[J.2]** **Yinmiao Li**, Xiaoyang Zhou, Daragh Byrne, Marti Louw (2024). ***"Documentation is now so ingrained in me"*: how students interpret and value documentation in creative learning domains**. *International Journal of Technology and Design Education*, Vol. 34, Issue 5, pp. 1987-2003. DOI: 10.1007/s10798-024-09889-3

**[P.4]** **Yinmiao Li**, Fangqing He, Yumih Chang, Qianyi Chen, Mingnan Du (2023). **Enchanting Woods: Engaging Children in Creative Expression through Interactive Storytelling and Embodied Interaction**. Proceedings of *Constructionism /fablearn 2023*. ETC Press - Carnegie Mellon University.

**[P.3]** **Yinmiao Li**, John Chen (2023). **Creative Expression through Color and Sound: A NetLogo Model for the Sonification of Color and the Visualization of Sound**. Proceedings of *Constructionism /fablearn 2023*. ETC Press - Carnegie Mellon University.

**[C.3]** **Yinmiao Li**, Jennifer Nwogu, Amanda Buddemeyer, Jaemarie Solyst, Jina Lee, Erin Walker, Amy Ogan, Angela EB Stewart. (2023). **"I want to be unique from other robots": positioning girls as co-creators of social robots in culturally-responsive computing education**. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 2023/4/19. DOI: 10.1145/3544548.3581272

**[P.2]** **Yinmiao Li**, Xiaoyang Zhou, Daniel Klug, Daragh Byrne, Marti Louw. (2023). **Exploring Students Interpretations and Values of Documentation in Creative Learning Domains.**. In *Proceedings of the 17th International Conference of the Learning Sciences-ICLS 2023*, pp. 2017-2018. International Society of the Learning Sciences. 2023. DOI: 10.22318/icls2023.320691

**[J.1]** Roushdy Al-Shawwa, Rodolfo Cossovich, **Yinmiao Li**, Jace Hargis. (2023). **Realizing the Importance of Course Design Through Rapid and Frequent Modifications in Instructional Modality**. *The Online Journal of New Horizons in Education*, Vol. 13, Issue 3.

**[P.1]** Fangqing He, Yumih Chang, **Yinmiao Li**, Mingnan Du, Qianyi Chen. (2021). **Programmable Little Red: A Multi-thread Immersive and Interactive Storytelling Approach to Learning Conditional Statements**. In *Proceedings of the 17th ACM Conference on International Computing Education Research*, pp. 450-451. 2021. DOI: 10.1145/3446871.3469797

**[C.2]** **Yinmiao Li**, Ziyue Piao, Gus Xia (2021). **A Wearable Haptic Interface for Breath Guidance in Vocal Training**. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. 2021/4/01.

**[C.1]** Yian Zhang, **Yinmiao Li**, Daniel Chin, Gus Xia. (2019). **Adaptive Multimodal Music Learning via Interactive-haptic Instrument** . In *Proceedings of the International Conference on New Interfaces for Musical Expression*. 2019/6/4. DOI: 10.48550/arXiv.1906.01197

## Talks and Presentations

T=Talk

**[T.3]** **Exploring the interplay of metacognition, affect, and behaviors in an introductory computer science course for non-majors.** Guest Speaker, *Undergraduate Research Track Course.* October 2025.

**[T.2]** **The New Prerequisites: Underexplored Opportunities for Emerging Technologies to Support Human Learning** Guest Speaker, *Dolby.* Feb 2025.

**[T.1]** **Exploring the interplay of metacognition, affect, and behaviors in an introductory computer science course for non-majors.** *Design Research Cluster Fellowship Final Presentation, Northwestern University Center for Human-Computer Interaction and Design.* April 2024.

## Selected Awards and Honors

**ACM ICER 2024 Best Paper**: *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*

## Professional Service

### Conference Organizer

- **Creativity and Cognition**, Student Volunteer Co-chair *2026*
- **Creativity and Cognition**, Student Volunteer Co-chair *2025*
- **Creativity and Cognition**, Student Volunteer Co-chair *2024*
- **International Conference on New Interface for Musical Expressions**, Art Installation Co-Chair *2021*

### Reviewer

- **ISLS Annual Meeting (2025-2026)**
- **ACM Conference on Human Factor in Computing Systems (2025)**
- **ACM Conference on Creativity and Cognition (2025)**
- **International Conference on New Interface for Musical Expressions (2021)**

### Student Volunteer

- **Symposium on AI, Education, and the Learning Sciences at Northwestern University**, Student Volunteer *2025*
- **ACM Conference on Interaction Design and Children**, Student Volunteer *2024*
- **ACM Designing Interactive Systems Conference (DIS)**, Student Volunteer *2022*
- **International Conference on New Interface for Musical Expressions (2021)**, Student Volunteer *2019*

## Research Experience

- **Delta Lab, Tidal Lab, Northwestern University** *Sept 2022 – Present*
  *PhD Researcher, advised by Dr. Elearnor O'Rourke and Michael Horn* Evanston, IL, USA
  - Conducted interviews and diary studies to investigate students' metacognitive and affective experiences while programming.
  - Applied a design-based research (DBR) approach integrating conceptual framework building, iterative prototyping, and classroom evaluation.
  - Designed and implemented an interactive reflection tool integrated into programming assignments to scaffold emotional and metacognitive regulation.
- **Carnegie Mellon University** *May 2022 - Dec 2022*
  *Graduate Student Research Assistant, advised by Marti Louw and Daragh Byrne* Pittsburgh, PA, USA
  - Assisted with the data analysis of exploring students interpretations and values of documentation in creative learning domains.
- **Carnegie Mellon University** *Sept 2021 - Sept 2022*
  *Graduate Student Research Assistant, advised by Dr. Angela Stewart and Amy Ogan* Pittsburgh, PA, USA
  - Assisted in thematic analysis of qualitative data that previously collected in social programmable robot project.
- **New York University, Abu Dhabi** *June 2019 - Aug 2019*
  *Undergraduate Summer Research Assistant, advised by Dr. Mohamad Eid* Abu Dhabi, UAE
  - Building software interface for both writing guidance and the recording interface combining with Raspberry Pi.
- **New York University, Shanghai** *Aug 2018 - Aug 2021*
  *Undergraduate Student Research Assistant, advised by Dr. Gus Xia and Margaret Minsky* Shanghai, China
  - Designing and evaluating two haptic guidance learning devices in the flute learning and vocal training.

## Teaching and Mentoring Experience

### Mentorship

- **Anna Hightower**, Computer Science Undergraduate, Northwestern University *Sep 2025 - Present*
- **Ting Pan**, Learning Sciences Master, Northwestern University *May 2025 - Dec 2025*
- **Jiayi Wang**, Learning Sciences Master, Northwestern University *Jan 2025 - Present*
- **Archie Silverstein**, Computer Science Undergraduate, Northwestern University *Mar 2024 - May 2024*
- **Ella Cutler**, Computer Science Undergraduate, Northwestern University *Sept 2023 - May 2024*
- **Dani Zhang**, Computer Science Undergraduate, Northwestern University *Sept 2023 - Dec 2023*

### Teaching

- **Graduate Teaching Assistant**, CS329 HCI Studio, Northwestern University *Sep 2025 - Present*
- ***Computing Everywhere*** **Section Instructor**, School of Communication, Northwestern University *Jan 2026*
- **Graduate Teaching Assistant**, CS110 Intro to Computer Programming, Northwestern University *Sep 2025 - Present*
- ***Computing Everywhere*** **Section Instructor**, School of Communication, Northwestern University *Feb 2025*

## Selected Projects

- **Emotion and Metacognition in Computing Education** *Mar 2023 - Present*
  *Doctoral Research* Northwestern University
  - Investigating how emotional and metacognitive processes shape students' engagement in programming.
  - Conducted diary and interview studies revealing how limited regulation strategies and negative emotion affect persistence.
  - Adopted a design-based research approach to iteratively design and evaluate interactive reflection tools integrated into programming homework that scaffold emotional and metacognitive regulation.
  - Currently analyzing classroom-scale deployments with multiple design versions and student interaction-log data, complemented by ethnographic studies of help-seeking in office hours and online forums.
- **Behavior2Affect** *Jan 2025 – Present*
  *Research co-lead, Research mentor* Northwestern University
  - investigating whether machine learning can be used to infer students' emotional states during programming sessions based on log data, including keystroke and mouse dynamics, code snapshots, and console messages.
  - designing lab study including synchronous observation in a controlled laboratory environment, retrospective interview, survey
  - mentoring students on conducting lab studies and data analysis
- **Art and Wellness Ethnographic Study** *Mar 2025 – Present*
  *Graduate Student Researcher* Northwestern University
  - Conducted ethnographic observation and interviews at a community art-and-wellness program.

◦ Analyzed how non-judgmental, inclusive spaces foster psychological safety and creativity, informing design for emotional well-being.

- **AR + NetLOGO Spatial Thinking** *Jan 2023 – Jul 2023*
  *Graduate Student Researcher* Northwestern University
  ◦ Designed and facilitated an eight-week participatory workshop exploring AR tools for spatial reasoning.
  ◦ Guided ideation, prototyping, and development using NetLogo with elementary-school students.

- **MedLab: Visitors' Interactions with a Medical Patient Simulator** *Sep 2022 – Jan 2024*
  *Graduate Student Researcher* Museum of Science and Industry
  ◦ Collected and analyzed video data of patient simulators in museum and clinical contexts

- **Social Robots with Middle-School Girls of Color** *Sept 2021 – Sept 2022*
  *Graduate Student Researcher* Carnegie Mellon University
  ◦ Led thematic analysis of co-design workshops where girls designed social robots reflecting their identities.

- **Documentation and Creative Learning Practices** *May 2022 – Dec 2022*
  *Graduate Student Researcher* Carnegie Mellon University
  ◦ Contributed a reusable qualitative codebook for analyzing documentation as both metacognitive practice and social communication artifact.

- **Scholastic / Striving Readers Project** *Dec 2021 – Aug 2022*
  *Master's Capstone Project* Carnegie Mellon University
  ◦ Conducted contextual inquiry with teachers and literacy specialists to identify barriers faced by striving readers.
  ◦ Designed digital literacy interventions combining emotional support and personalized feedback.
  ◦ Produced design documentation and prototypes for inclusive literacy technologies.

- **Programmable Little Red** *Oct 2022 – Mar 2021*
  *Co-Lead Researcher* New York University, Shanghai
  ◦ Designed physical interactions using Micro:Bit and Scratch; co-designed and facilitated a 4-day participatory workshop for six grade-school students.
  ◦ Led interaction design, workshop structure, and qualitative data collection/analysis.

- **Wearable Haptic Interface for Breath Guidance in Vocal Training** *Oct 2019 – May 2021*
  *Lead Researcher, Undergrad Capstone* New York University, Shanghai
  ◦ Developed a wearable haptic exoskeleton providing tactile feedback for diaphragmatic breathing in vocal training.
  ◦ Designed control mechanism, hardware integration, and conducted case-study evaluation.

- **Haptic Guidance Flute** *Aug 2018 – May 2020*
  *Research Assistant* New York University, Shanghai
  ◦ Improved an existing haptic flute learning system by redesigning the C-ring mechanism and conducting a long-term learning-rate experiment.
  ◦ Introduced a dynamic learning strategy integrating adaptive feedback; results showed a 45 % faster learning rate and 86 % reduced forgetting compared with static learning.

- **Haptic Handwriting Device** *Jun 2019 – Aug 2019*
  *Summer Research Assistant* New York University, Abu Dhabi
  ◦ Implemented recording and training systems enabling teachers to capture and replay handwriting trajectories for learners.

## Professional Experience

- **New York University, Shanghai** *Aug 2020 – Aug 2021*
  *IMA Fellow Researcher* Shanghai, China
  ◦ Contributed to research activities by providing specialist input based on professional expertise, practice, experience, and qualifications.
  ◦ Delivered personalized educational in physical computing and programming targeting undergrad students from NYU Shanghai.
  ◦ Provided behavioral and emotional support to individual students to build their projects and enable positive learning outcomes.

- **MustardTek** *Jun 2021 – Jul 2021*
  *Part-time Mentor* Shanghai, China
  ◦ Taught skills in 3D modeling, Circuits Design and Programming via both classroom and individual instruction.
  ◦ Encouraged students to co-design with people with disabilities and brought inclusive atmosphere.

- **Hackability@UWC** *Jan 2021 – Feb 2021*
  *Part-time Mentor* Changshu, China
  ◦ Taught group of up to 7 Grade 9-12 students to design assistive technology for people with disabilities.

◦ Encouraged students to co-design with people with disabilities and brought inclusive atmosphere.

- **Koding Kreators** *Jun 2018 – Aug 2020*
  *Summer Camp Teaching Assistant Intern* Shanghai, China
  ◦ Supported teachers on developing the K-12 STEAM course curriculum.
  ◦ Assisted students with personalized instruction in class.
  ◦ Prepared teaching materials for teachers each class.
- **MFEducation** *Jun 2018 – Aug 2020*
  *Maker Education Tutor Intern* Shanghai, China
  ◦ Taught secondary school students on circuit design and Arduino programming.
  ◦ Supported students to develop problem-solving skills and implement the idea.