

Qianou Christina Ma

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Research Focus

My research intersects Human-AI Interaction, Generative AI, and Learning Sciences. I **design, build, and evaluate LLM-based applications** (student-facing [R1] and instructor-facing [W1]) to help optimize human-AI task delegation for the future, especially in a Computer Science education context.

Education

Carnegie Mellon University Human-Computer Interaction Institute (CMU HCII)

Pittsburgh, PA

PH.D. IN HUMAN-COMPUTER INTERACTION

Sept. 2022 - present

Advisors: Dr. **Ken Koedinger** & Dr. **Sherry Tongshuang Wu** **Relevant Coursework:** Deep Learning; Advanced NLP; LLM Systems; Learning Design

Skills (Programming & Framework): Python, Pytorch, JavaScript/TypeScript, React/Flask, C++/C, CUDA, R, SML, Go, \LaTeX , Nools

Carnegie Mellon University (CMU)

Pittsburgh, PA

B.S. IN COGNITIVE SCIENCE, B.S. IN COMPUTER SCIENCE, MINOR IN DESIGN FOR LEARNING (QPA: 3.91/4.0)

Sept. 2018 - May. 2022

Publications

SUBMITTED (IN REVIEW)

- [S1] **Qianou Ma**, Weirui Peng, Chenyang Yang, Hua Shen, Kenneth Koedinger, and Tongshuang Wu. **What Should We Engineer in Prompts? Training Humans in Requirement-Driven LLM Use**. In *Submission*, 2025.
- [S2] **Qianou Ma***, Dora Zhao*, Xinran Zhao, Chenglei Si, Chenyang Yang, Ryan Louie, Ehud Reiter, Diyi Yang, and Tongshuang Wu. **SPHERE: Evaluation Cards for Human-AI System Evaluation**. In *Submission*, 2025. *Equal contribution.

PEER-REVIEWED CONFERENCE AND JOURNAL PUBLICATIONS

- [R1] **Qianou Ma**, Hua Shen, Kenneth Koedinger, and Tongshuang Wu. **How to Teach Programming in the AI Era? Using LLMs as a Teachable Agent for Debugging**. In *International Conference on Artificial Intelligence in Education*. Springer, 2024. 🏆 **Best Paper**.
- [R2] Atharva Naik, Jessica Ruhan Yin, Anusha Kamath, **Qianou Ma**, Sherry Tongshuang Wu, Charles Murray, Christopher Bogart, Majd Sakr, and Carolyn P. Rose. **Generating Situated Reflection Triggers About Alternative Solution Paths: A Case Study in Generative AI for Computer-Supported Collaborative Learning**. In *International Conference on Artificial Intelligence in Education*. Springer, 2024. 🏆 **Best Paper Nominee**.
- [R3] Atharva Naik, Jessica Ruhan Yin, Anusha Kamath, **Qianou Ma**, Sherry Tongshuang Wu, R. Charles Murray, Christopher Bogart, Majd Sakr, and Carolyn P. Rose. **Providing tailored reflection instructions in collaborative learning using large language models**. *British Journal of Educational Technology*:20.

PEER-REVIEWED WORKSHOP, POSTERS & WORK-IN-PROGRESS

- [W1] **Qianou Ma***, Yann Hicke*, Anmol Agarwal*, and Paul Denny. **AI-TA: Towards an Intelligent Question-Answer Teaching Assistant using Open-Source LLMs**. In *Proceedings of the Workshop on Generative AI for Education (GAIED) - co-located with 37th Conference on Neural Information Processing Systems (NeurIPS 2023)*, 2023. *Equal contribution.
- [W2] **Qianou Ma**, Tongshuang Wu, and Kenneth Koedinger. **Is AI the better programming partner? Human-Human Pair Programming vs. Human-AI pAIr Programming**. In *Proceedings of the Workshop on Empowering Education with LLMs - the Next-Gen Interface and Content Generation 2023 co-located with 24th International Conference on Artificial Intelligence in Education (AIED 2023)*, pages 64–77, 2023.
- [W3] Aysa Xuemo Fan, Rully Agus Hendrawan, Yang Shi, and **Qianou Ma**. **Enhancing Code Tracing Question Generation with Refined Prompts in Large Language Models**. *SIGCSE TS 2024 (55th ACM Technical Symposium on Computer Science Education)*, 2024.

Awards & Fellowships

HONORS & AWARDS

- 2024 **Best Paper & Best Interactive Event**, best paper and the best interactive event [R1] awarded at AIED 2024 Recife, Brazil
- 2024 **Best Paper Nominee**, best paper nominee [R2] at AIED 2024 Recife, Brazil
- 2023 **Generative AI Innovation Incubator (GAI3) Hackathon**, 1st place winning team awarded with \$20,000 Pittsburgh, PA
- 2021 **Phi Beta Kappa**, 1 of 16 seniors selected in Fall 2021 Pittsburgh, PA

FELLOWSHIPS & GRANTS

2021	Support Designer-Teacher Collaboration in Educational Game Design Using Learning Science Principles, CMU Dietrich College Senior Honors Fellowship	\$6500
2020	The contribution of local and global language statistics to the development of structured semantic networks, CMU Summer Undergraduate Research Fellowship	\$3500
2020	Improving Museums' Websites to Support Teachers & Parents: a Case Study of the Carnegie Museum of Art, CMU Small Undergraduate Research Grant	\$500
2019	Patterns of linguistic input differentially predict relatedness in children's semantic structure, Ireland Undergraduate Research Fund	\$1750

Presentations

2024 Fall	Invited Talk , Scaling Student Support: Online Question-Answering with LLM Tutors	Google DeepMind LearnLM
2024 Fall	Invited Talk , Training for the Future: Preparing Students for Effective Human-LLM Partnerships Computational Social Science (CSS) Group; Learning Science and Engineering (LSE) Seminar	University of Michigan; CMU
2024 Summer	Guest Speaker , Generative AI for CS Education: Human-AI Collaboration and Task Delegation	CMU AI for Humanities

Teaching & Mentoring Experience

2024 Fall	Mentor , CMU Paths to AI Research Program <i>for traditionally underrepresented</i>	2 undergraduate student
2022, 2024	Mentor , CMU SCS Graduate Application Support Program <i>for traditionally underrepresented</i>	3 Master's students
2023, 2024	Mentor , CMU LearnLab Summer School Computing Education Research Track (e.g., [W3])	7 Ph.D. and 1 Master's students
2023, 2024	Mentor , Independent Studies on LLM-assisted Learning Weirui Peng (Columbia MSEE, [S1]), Atharva Naik (now PhD at CMU LTI, [R2]), Vicky Zhou (CMU HCI, [R1])	3 Undergrad/grad students
2024 Fall	Teaching Assistant , CMU 05-430/630 Programming Usable Interfaces	70+ Undergrad/grad students
2023 Fall	Teaching Assistant , CMU 05-391/891 Design Human-Centered Software	60+ Undergrad/grad students
2021 Fall	Teaching Assistant , CMU 15-110 Principles of Computing	300+ Undergraduate students
2021 Summer	Teaching Assistant , CMU CS Scholar Pre-College Program <i>for traditionally underrepresented</i>	30+ Grades 9-12 students
2021 Spring	Teaching Assistant , CMU 15-150 Functional Programming (Reflection Blog)	300+ Undergraduate students
2019 Spring	Tutor , Assemble Girls' Maker Night After School Program; CMU LGC Gelfand Outreach	20+ Grades 5-8; K-2 students
2018 Fall	Tutor , Taylor Allderdice High School Writing Center	10+ Grades 9-10 students

Service & Leadership Experience

2024 - present	Program Committee , EDM (2024-2025), SIGCSE (2025)	
2022 - present	Reviewer , ACM CHI (2023-2025), ACM UIST (2024), NeurIPS (2023), Computers & Education (2024)	
2024 - 2025	Member , CMU HCII Ph.D. Admissions Committee	Pittsburgh, PA
2023 - present	Member , CMU School of Computer Science CS Curriculum Review Committee (CRC)	Pittsburgh, PA
2019 - present	Member , CMU University Disciplinary Committee & Academic Review Board	Pittsburgh, PA
2023 Spring	Director , CMU School of Computer Science Graduate Student Musical Organize and direct a musical revue with 30+ performers and 200+ audience	Pittsburgh, PA
2022 Fall	Co-leader , CMU Women@SCS TechNights (data bias session) Help organize a session on training data and data bias card game for 20+ female middle-school students	Pittsburgh, PA
2021 Fall	Member , CMU Teaching Innovation Award Selection Committee	Pittsburgh, PA
2018 - 2022	President (21-22), VP of Communications (20), Project Advisor (18-19) , CMU Project Ignite Collaborate with other organizations to recruit college students, provide free interdisciplinary project-based learning opportunities to local high-school students, increase diversity in high-school student application, and facilitate about 100 workshop sessions per year	Pittsburgh, PA
2018 - present	Docent , Carnegie Museum of Art (CMOA), leading public tours and school tours	Pittsburgh, PA