Qianou Christina Ma

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Education

Carnegie Mellon University Human-Computer Interaction Institute (CMU HCII) *Pittsburgh, PA*

PH.D. IN HUMAN-COMPUTER INTERACTION *Sept. 2022 - present*

- *Advisor:* Dr. Ken Koedinger & Dr. Sherry (Tongshuang) Wu
- *Relevant Coursework:* Gadgets & Sensors; Deep Learning;

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*

- *Relevant Coursework:* CS Pedagogy; Human Learning Optimization; Educational Goal, Assessment, Instruction; Personalized Online Learning; Design Educational Game; Design AI Products; Intro to Machine Learning; Parallel Distributed Processing; Neural Correlates of Learning & Memory

Skills

Software	Adobe (AE/PR/PS/AU), Figma, Arduino, Audacity, Google Analytics, SPSS, ELAN, CTAT
Programming	Python, C, C++, SML, R, Go, JavaScript, React, LaTeX, Nools
Languages	Mandarin, English
Research Methods	Cognitive Task Analysis, Thematic Analysis, Qualitative Interview, Survey, Automatic Data Collection, Experimental Design

Awards & Fellowships

ACADEMIC HONORS & AWARDS

2021	**Phi Beta Kappa**, 1 of 16 seniors selected in Fall 2021	*Pittsburgh, PA*
2019	*Bravery*. **First Place, College Prose**, The 20th Annual Martin Luther King, Jr. Day Writing Awards	*Pittsburgh, PA*

SCHOLARSHIP & FELLOWSHIPS

2021	***Support Designer-Teacher Collaboration in Educational Game Design Using Learning Science Principles***, CMU Dietrich College Senior Honors Fellowship	*$6500*
2021	***VR-Enabled Pedagogy in a First-Year Seminar***, Travel Award. Dietrich College Parents Fund	*$250*
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	***2019 Patterns of linguistic input differentially predict relatedness in children's semantic structure***, Ireland Undergraduate Research Fund	*$1750*

Research Experience

Graduate Research Assistant, Codex Assistant for Novice Debugging & Testing *Pittsburgh, PA*

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. KEN KOEDINGER & DR. SHERRY WU *Sept. 2022 - present*

- Review literature on large-language code-generation models and debugging instruction for novice programmers
- Design initial interaction and assessment for a tool using Codex to assist students in learning debugging and testing skills

Principal Investigator, CS Game Design Support Tool Study *Pittsburgh, PA*

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. ERIK HARPSTEAD *Feb. 2021 - Sept. 2022*

- Conducted a quasi-experiment case study to investigate how the forms and presentation of learning science principles influence designer-teacher collaboration in CS educational game design
- Created ideation workshop protocols, rubrics, and a web-based design support tool with click-tracking
- Published a work-in-progress as the first-author and presented at 2021 CHI-Play Conference

Principal Investigator, VR-Enabled Pedagogies Case Study
Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. LAUREN HERCKIS
Jan. 2021 - Aug. 2022

- Collected and analyzed student learning and perception of VR data using descriptive coding
- Conducted literature review on VR pedagogies, implemented a case study on the integration of VR technologies into an interdisciplinary first-year seminar, Unreality: Immersive and Spatial Media
- Published a work-in-progress as the first-author and presented at 2021 iLRN Conference

Research Assistant, Cognitive Linguistics Lab
Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. BONNIE NOZARI
Sept. 2020 - Dec. 2020

- Selected stimulus set and designed a counterbalanced experiment with PMI & log-likelihood scores to explore associative & taxonomic semantic relation's distinct influence on language production
- Implemented a picture-naming typing online experiment using jsPsych, psiTurk, and MTurk

Research Assistant, Multimodal Analytics with Math Learning
Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. LUJIE (KAREN) CHEN
Dec. 2019 - Feb. 2020

- Helped specify coding scheme of math tutoring, help-seeking, and problem-solving dynamics
- Annotated multimodal data of parent-children math tutoring video clips using ELAN and R

Principal Investigator, Carnegie Museum of Art Website Study
Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. SHARON CARVER
Sept. 2019 - May. 2020

- Conducted a case study to improve information design of art museums' websites for educators
- Designed website rubrics; conducted a comparative analysis, a survey, and a card sorting user study

Research Assistant & Principal Investigator, Cognitive Development Lab
Pittsburgh, PA

CARNEGIE MELLON UNIVERSITY.   ADVISOR: DR. ANNA FISHER & DR. CATARINA VALES
Feb. 2019 - Aug. 2020

- Investigated word relations' influence on children's semantic acquisition; cleaned data, calculated, and analyzed statistical measures (GloVe, LSA, PMI) from corpus (e.g., Childes, Common Crawl)
- Presented progress reports and findings at lab meetings and undergraduate research symposium
- Assisted lab tasks including PPVT coding & SpAM tasks data collection with 3- to 5-year-olds

Teaching Experience

2021 Fall	**Teaching Assistant**, 15-110 Principles of Computing (300+ Undergraduate students)	*CMU, Pittsburgh, PA*
	Co-led recitations and review session, developed and play-tested teaching materials, hosted office hours, and graded homework.	
2021 Summer	**Teaching Assistant**, CS Scholar Pre-College Program (30+ Grades 9-12 students)	*CMU, Pittsburgh, PA*
	Assisted teaching in a pre-college CS program for high school students from traditionally underrepresented communities in CS.	
2021 Spring	**Teaching Assistant**, 15-150 Functional Programming (300+ Undergraduate students)	*CMU, Pittsburgh, PA*
	Co-taught labs of 20+ students, developed and play-tested teaching materials, hosted office hours, graded homework, facilitated communication and student feedback for 20 hrs/week.	
2019 Spring	**Teaching Assistant**, CMU LGC Gelfand Outreach (15+ Grades K-2 students)	*Pittsburgh, PA*
2019 Spring	**Project Advisor**, Project Ignite Machine Learning Team (5+ Grades 9-12 students)	*Pittsburgh, PA*
2019 Spring	**Tutor**, Assemble Girls' Maker Night After School Program (10+ Grades 5-8 students)	*Pittsburgh, PA*
2018 Fall	**Tutor**, Taylor Allderdice High School Writing Center (10+ Grades 9-10 students)	*Pittsburgh, PA*
2018 Summer	**Teaching Assistant & Tutor**, TOEFL & SAT @ Sanli & Peer Insight (50+ Grades 9-11 students)	*Shanghai, China*

Leadership & Service Experience

2021 Fall	**Member**, CMU Teaching Innovation Award Selection Committee	*Pittsburgh, PA*
	Serve to review nominations of faculty members for the CMU teaching innovation award	
2019 - present	**Member**, CMU University Disciplinary Committee & Academic Review Board	*Pittsburgh, PA*
	Serve as a board member to review student violations of community standards in hearings	
2018 - 2022	**President (21-22), VP of Communications (20), Project Advisor (18-19),** CMU Project Ignite	*Pittsburgh, PA*
	Collaborate with other organizations to recruit college students, provide free interdisciplinary project-based learning opportunities to local high-school students, and facilitate about 100 workshops per year	

2018 - present	**Docent**, Carnegie Museum of Art (CMOA)	*Pittsburgh, PA*
	Serve as a volunteer docent to lead public tours and developed STEAM theme K-12 school tours at the museum	
2019	**Member,** CMU Initiating Meaningful Pittsburgh and Qatar Ties	*Pittsburgh, PA*
	Host CMU Qatar students to foster cultural understandings between Pittsburgh and Qatar campuses	

Presentations & Talks

Conferences & Symposiums

[P1] **Q. Ma** and E. Harpstead. Using learning science principle cards in educational game ideation. In Madison, WI. Play-Make-Learn, 2022.

[P2] **Q. Ma**, C. Vales, and A. Fisher. The contribution of taxonomic and associative language statistics to the development of structured semantic networks. In Pittsburgh, PA. CMU Meeting of the Minds Undergraduate Research Symposium, 2021.

Peer-reviewed Publications

Extended Abstracts & Work-in-Progress

[E1] **Q. Ma** and E. Harpstead. Support designer-teacher collaboration in educational game design using learning science principles. In *Extended Abstracts of the 2021 Annual Symposium on Computer-Human Interaction in Play*, pages 117–121, 2021.

[E2] **Q. Ma** and L. Herckis. Work-in-progress: VR-enabled pedagogy in a first-year seminar. In *2021 7th International Conference of the Immersive Learning Research Network (iLRN)*, pages 1–3. IEEE, 2021.