

# Qiao Zhang

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## EDUCATION

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<b>Georgia Institute of Technology</b> PhD student in Computer Science	GPA: 4/4	Atlanta, GA 08/22 – expected 06/25
<b>Drexel University</b> PhD student in Information Science	GPA: 4/4	Philadelphia, PA 09/20 – 08/22
<b>University of Pennsylvania</b> M.S.Ed. in Statistics Measurement and Research	GPA: 3.4/4	Philadelphia, PA 08/17 – 05/19
<b>Dongbei University of Finance and Economics</b> B.S. in Economic Statistics	GPA: 3.6/4	Dalian, China 09/13 – 07/17

## COURSEWORK & SKILLS

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Knowledge-based AI, Deep Learning, Developing User Interfaces, Qualitative Research Methods, Human-centered Computing  
Tools: Python, JavaScript, HTML, CSS, C#, MySQL, R, SAS, SPSS, Git, Unity, MTurk, Qualtrics

## EXPERIENCE

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<i>Student Researcher</i>	<b>STRONG (Army Research Lab)</b>	05/22 – present
<ul style="list-style-type: none"><li><b>Game programming:</b> implement a WebSocket in Python to communicate with Unity for two human-AI teaming games</li><li><b>Agent-design:</b> apply the RETE algorithm to create game state representation and design AI agents as lead student developer</li></ul>		
<i>Full Stack Engineer</i>	<b>Xenon Health of New Jersey LLC</b>	10/19 – 08/20
<ul style="list-style-type: none"><li><b>Developing:</b> developed and maintained web applications (billing software, warehouse management) for 60-people company</li><li><b>Cybersecurity:</b> set up HIPAA-compliant AWS environment via CLI (S3, EC2, Workspace); encrypt data and set permission</li></ul>		

## PROJECTS

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<b>Gomoku Training Experiment</b>	04/21 – present
<ul style="list-style-type: none"><li><b>Model training:</b> trained 20 models using an AlphaZero implementation of Gomoku and compared their true skills</li><li><b>Web development:</b> designed and developed a web-based Gomoku tutor using Flask and SQLite; launched load testing</li><li><b>User study:</b> collected 327 participants' data from MTurk, conducted learning analytics across different learning conditions</li></ul>	
<b>Investigating Knowledge Tracing Models Using Simulated Students</b>	09/20 – 06/22
<ul style="list-style-type: none"><li><b>Simulation:</b> generated 30 AI learners with Apprentice Learner architecture to investigate the online use of 5 learning models</li><li><b>Data Mining:</b> predicted simulated students' correctness on each knowledge component after training with 240 questions</li><li><b>Visualization:</b> plotted the learning curves and sequences for each knowledge component to understand the learning process</li></ul>	

## PUBLICATIONS

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- Zhang, Q.** (2023). Understanding Human-AI Teaming Dynamics through Gaming Environments. In *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment* (Vol. 19, No. 1, pp. 440-443).
- Harpstead, E., Stowers, K., Lawley, L., **Zhang, Q.**, MacLellan, C.J. (2023). Speculative Game Design of Asymmetric Cooperative Games to Study Human-Machine Teaming. In *Proceedings of The First Workshop on Human-AI Interaction through Play @ The Foundations of Digital Games 2023* (pp. 1-4).
- Hannan, D., Nesbit, S.C., Wen, X., Smith, G., **Zhang, Q.**, Goffi, A., Chan, V., Morris, M.J., Hunninghake, J.C., Villalobos, N.E., Kim, E., Weber, R.O., MacLellan, C.J. (2023). MobilePTX: Sparse Coding for Pneumothorax Detection Given Limited Training Examples. In *Proceedings of The Thirty-Fifth Annual Conference on Innovative Applications of Artificial Intelligence* (Vol. 37, No. 13, pp. 15675-15681).
- Zhang, Q.**, MacLellan, C.J. (2022). (A)I Will Teach You to Play Gomoku: Exploring the Use of Game AI to Teach People. In *Proceedings of the Ninth ACM Conference on Learning@Scale* (pp. 263-266).
- Zhang, Q.**, Chen, Z., Lalwani, N., & MacLellan, C. (2022). Modifying Deep Knowledge Tracing for Multi-step Problems. In *Proceedings of the 15th International Conference on Educational Data Mining* (p. 684).
- Zhang, Q\***, Smith, G\*, MacLellan, C.J. (2022). Do it Like the Doctor: How We Can Design a Model That Uses Domain Knowledge to Diagnose Pneumothorax. In *AAAI Spring Symposium: Machine Learning and Knowledge Engineering for Hybrid Intelligence. 2022*.
- Zhang, Q.**, MacLellan, C.J. (2021). Going Online: A simulated student approach for evaluating knowledge tracing in the context of mastery learning. In *Proceedings of the 14th International Conference on Educational Data Mining* (pp. 331-337).
- Zhang, Q.**, MacLellan, C.J. (2021). Investigating Knowledge Tracing Models using Simulated Students. *AAAI2021 Spring Symposium on Artificial Intelligence for K-12 Education*.

## **PRESENTATIONS**

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- 2023 – Demoed multiple game AI programs at STRONG Human Machine Teaming Paradigm Development Meeting
- 2023 – Presented poster with demo on multiple game AI components at GVV Research Showcase in Spring 2023
- 2022 – Invited to present work on Gomoku tutor at the GamesCrafters group at University of California, Berkeley
- 2022 – Presented poster with demo on Gomoku tutor at GVV Research Showcase in Fall 2022
- 2022 – Presented work on investigating online knowledge tracing at NSF AI-ALOE annual review
- 2022 – Presented work on building game AI agent at STRONG workshop
- 2022 – Presented work in progress paper as a poster at the 2022 ACM Conference on Learning at Scale
- 2022 – Presented short paper at the 15th International Conference on Educational Data Mining
- 2021 – Presented short paper at the 14th International Conference on Educational Data Mining
- 2021 – Presented poster at Drexel AI Symposium
- 2021 – Presented short paper at AAAI2021 Spring Symposium on Artificial Intelligence for K-12 Education

## **SERVICES**

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- 2023 – Peer reviewer for CHI 2024
- 2023 – Peer reviewer for Women in Machine Learning Workshop
- 2023 – Teaching Assistant for CS 7637 Knowledge-Based AI
- 2023 – Teaching Assistant for CS 6795 Intro to Cognitive Science course
- 2023 – Peer reviewer for the 61st Annual Meeting of the Association for Computational Linguistics (ACL'23)
- 2022 – Mentor at Women in Computer Society at Drexel University
- 2022 – Mentor at Simon Initiative LearnLab Summer School
- 2022 – Peer reviewer for the journal, Information and Learning Sciences
- 2021 – Member at Upsilon Pi Epsilon – International Honor Society for the Computing and Information Disciplines
- 2021 – Mentor at Simon Initiative LearnLab Summer School
- 2019 – Starting to volunteer as an alumni interviewer at University of Pennsylvania
- 2018 – Teaching Assistant for IMPA 6030 Quantitative Method course,

## **AWARDS & SCHOLARSHIPS**

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- 2022 – Activision Blizzard King Women in Games Scholarship
- 2021 – Grace Hopper Celebration Scholarship
- 2017 – Meritorious Winner (1st place) in 2017 Mathematical Contest in Modeling (MCM), USA
- 2017 – Honor Graduate (top 5%), Merit Student, Comprehensive Scholarship at Dongbei University of Finance and Economics