

RUIYANG QIN

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RESEARCH INTERESTS

Edge AI, Emerging Technologies, Large Language Model (LLM)

Overview: *My research is personalized edge AI for healthcare backed by emerging technologies. I conduct research on AI algorithms and software and hardware co-design methods towards healthcare and medical applications, especially in language-related areas. My main contribution is to bridge the emerging technologies/resource-efficient architectures and the advanced machine learning models like LLM.*

EMPLOYMENT

SUNY at Buffalo

Visiting Ph.D. student, Computer Science and Engineering
Supervisor: Jinjun Xiong

Buffalo, New York
Aug. 2024 - Jan. 2025

University of Notre Dame

Ph.D. Student, Computer Science and Engineering
Advisor: Yiyu Shi

Notre Dame, Indiana
Aug. 2022 - May. 2025

EDUCATION

Georgia Institute of Technology

M.S. in Computer Science
B.S. in Computer Science

Atlanta, Georgia
2021
2020

AWARDS

- William J. McCalla Best Paper Nomination at ICCAD (10 out of 850 papers), 2024, USA
- IAD Academic Fellowship from University at Buffalo, 2024, USA
- Notre Dame Notebaert Professional Development Fund, 2024, USA
- Edison Innovation Fellow, 2024, USA
- DAC Young Fellow, 2024, USA
- DAC Young Fellow, 2023, USA

REVIEW SERVICES

- IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)
- IEEE Intelligent Systems
- Conference on Neural Information Processing Systems (NeurIPS)
- Association for the Advancement of Artificial Intelligence (AAAI)
- Journal of Medical Internet Research (JMIR)
- International Conference on Learning Representations (ICLR)
- Artificial Intelligence and Statistics (AISTATS)

TEACHING

- CSE 30151 - Theory of Computing, Notre Dame, Spring 2023
- CSE 30246 - Database Concepts, Notre Dame, Fall 2022
- CS 6476 - Computer Vision, Georgia Tech, Spring 2021

RESEARCH GRANT

- Participate as PhD student, “On-device Large Language Model Personalization with Algorithm-Hardware Co-design for Healthcare Applications”, National Science Foundation, \$569,269

RESEARCH GIFT

- Gemma Academic Program (GCP) by Google, 07/21/2024 - 07/21/2025, \$15,000

PUBLICATIONS

Conferences

- **Ruiyang Qin**, Pengyu Ren, Zheyu Yan, Liu Liu, Dancheng Liu, Amir Nassereldine, Jinjun Xiong, Kai Ni, Sharon Hu, Yiyu Shi *NVCiM-PT: An NVCiM-assisted Prompt Tuning Framework for Edge LLMs*, Design Automation and Test in Europe (DATE), 2025
- Gelei Xu, Ningzhi Tang, Jun Xia, **Ruiyang Qin**, Wei Jin, Yiyu Shi *Enabling Memory-Efficient On-Device Learning via Dataset Condensation*, Design Automation and Test in Europe (DATE), 2025
- Gelei Xu, **Ruiyang Qin**, Zhi Zheng, Yiyu Shi, *An Adaptive System for Wearable Devices to Detect Stress Using Physiological Signals*, PhysioCHI: Towards Best Practices for Integrating Physiological Signals in HCI, 2024
- **Ruiyang Qin**, Zheyu Yan, Dewen Zeng, Zhenge Jia, Dancheng Liu, Jianbo Liu, Zhi Zheng, Ningyuan Cao, Kai Ni, Jinjun Xiong, Yiyu Shi, *Robust Implementation of Retrieval-Augmented Generation on Edge-based Computing-in-Memory Architectures*, The 43st IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2024 (acceptance rate 24.2%) (**Best Paper Nomination**)
- **Ruiyang Qin**, Jun Xia, Zhenge Jia, Meng Jiang, Ahmed Abbasi, Peipei Zhou, Jingtong Hu, Yiyu Shi, *Enabling On-Device Large Language Model Personalization with Self-Supervised Data Selection and Synthesis*, The 61st IEEE/ACM Design Automation Conference (DAC), 2024 (acceptance rate 21.8%)
- **Ruiyang Qin**, Yuting Hu, Zheyu Yan, Jinjun Xiong, Ahmed Abbasi, Yiyu Shi, *FL-NAS: Towards Fairness of NAS for Resource Constrained Devices via Large Language Models*, The 29th Asia and South Pacific Design Automation Conference (ASP-DAC), 2024(acceptance rate 31%)
- Haozheng Luo, **Ruiyang Qin**, Chenwei Xu, Guo Ye, Zening Luo, *Open-Ended Multi-Modal Relational Reasoning for Video Question Answering*, The 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2023
- Zhiding Liang, Zhixin Song, Jinglei Cheng, Zichang He, Ji Liu, Hanrui Wang, **Ruiyang Qin**, Yiru Wang, Song Han, Xuehai Qian, Yiyu Shi, *Hybrid gate-pulse model for variational quantum algorithms*, The 60th IEEE/ACM Design Automation Conference (DAC), 2023 (acceptance rate 22.7%)

Journal

- **Ruiyang Qin***, Ryan Cook*, Kai Yang, Ahmed Abbasi, David Dobolyi, Salman Seyedi, Emily Griner, Hyeokhyen Kwon, Robert O. Cotes, Zifan Jiang, and Gari D. Clifford, *Language Models for Online Depression Detection: A Review and Benchmark Analysis on Remote Interviews*, ACM Transactions on Management Information Systems (TMIS)
- Marialena Bevilacqua, Kezia Oketch, **Ruiyang Qin**, Will Stamey, Xinyuan Zhang, Yi Gan, Kai Yang, Ahmed Abbasi, *When Automated Assessment Meets Automated Content Generation: Examining Text Quality in the Era of GPTs*, ACM Transactions on Information Systems (TOIS)

Under Review

- **Ruiyang Qin***, Dancheng Liu*, Zheyu Yan, Zhaoxuan Tan, Zixuan Pan, Zhengge Jia, Meng Jiang, Ahmed Abbasi, Jinjun Xiong, Yiyu Shi, *Empirical Guidelines for Deploying LLMs onto Resource-constrained Edge Devices*, International Conference on Learning Representations (ICLR), 2024
- **Ruiyang Qin**, Haoxinran Yu, Lixuan Wei, Yuxuan Liu, Dancheng Liu, Ahmed Abbasi, Gelei Xu, Zhengge Jia, Zheyu Yan, Xiufan Yu, Zhi Zheng, Jinjun Xiong, Yiyu Shi *Analysis: Do Large Language Models Allow Fair Access to Healthcare for Language- Impaired Users?* Nature Medicine
- **Ruiyang Qin**, Dancheng Liu, Gelei Xu, Zheyu Yan, Jinjun Xiong, Yiyu Shi *Tiny-Alignment: Bridging Automatic Speech Recognition with LLM on Edge*, The 62st IEEE/ACM Design Automation Conference (DAC), 2025