

# RUIYANG QIN

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## RESEARCH INTERESTS

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

Overview: *My research is personalized on-device learning 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 - Present

*University of Notre Dame*

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

Notre Dame, Indiana  
Aug. 2022 - Present

## 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

## Talk

- “LLM Distillation and Quantization”, University of Notre Dame, 2024

## 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

- 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, Zheng 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 43rd IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2024 (acceptance rate 24.2%)
- **Ruiyang Qin**, Jun Xia, Zheng 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**<sup>\*</sup>, Ryan Cook<sup>\*</sup>, 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**<sup>\*</sup>, Dancheng Liu<sup>\*</sup>, Zheyu Yan, Zhaoxuan Tan, Zixuan Pan, Zheng 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**, 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
- **Ruiyang Qin**, Haoxinran Yu, Lixuan Wei, Yuxuan Liu, Dancheng Liu, Ahmed Abbasi, Gelei Xu, Zheng 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