

# Yuzhu Mao

<https://yz-mao.github.io>

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GitHub: <https://github.com/yz-mao>

## EDUCATION

- **Tsinghua University** Beijing, China  
*M.S. in Data Science and Information Technology; GPA: 3.85 / 4.00* Sep. 2020 – Jun. 2023
- **Wuhan University** Wuhan, China  
*B.E. in Information Security; GPA: 3.87 / 4.00 (Graduate with Distinction)* Sep. 2016 – Jun. 2020

## WORK EXPERIENCE

- **Tsinghua-UC Berkeley Shenzhen Institution (TBSI)** Shenzhen, China  
*Research Assistant, Advisor: Prof. Wenbo Ding* Sep. 2023 - Present
  - **Efficient and Generalized LLMs:** Explored quantization and low-rank adaptation techniques to reduce the computational complexity and memory footprint of LLMs for deployment on resource-constrained platforms.
  - **Code Contributions:** <https://github.com/yz-mao/Quantized-LoRA-Finetuning-of-GPT-2>
- **Meituan Technology** Shenzhen, China  
*Algorithm Engineer Intern, UAV Group, Manager: Tianjian Chen* Jun. 2022 - Sep. 2022
  - **Texture Generation:** Empowered a 2D to 3D platform for large-scale UAV simulations by creating realistic textures from 2D images.
- **Tencent Technology** Shenzhen, China  
*Algorithm Engineer Intern, Robotics-X Lab, Manager: Cheng Zhou* Jun. 2021 - Sep. 2021
  - **Optimization Acceleration with GPU:** Enhanced the performance of an open-source JAX-based rigid body dynamics algorithm library by leveraging GPU acceleration for faster computations.
  - **Code Contributions:** <https://github.com/Tencent-RoboticsX/jbdl>
- **Institute for AI Industry Research (AIR), Tsinghua University** Beijing, China  
*Research Assistant, Advisor: Prof. Yang Liu* Aug. 2020 - Jun. 2021
  - **Efficient and Reliable Federated Learning:** Designed and experimented with adaptive quantization methods to reduce communication overhead in distributed learning systems.

## ADDITIONAL RESEARCH PROJECTS

- **Deep Learning-based Text-to-Speech Synthesis System** Wuhan, China  
*Distinct Undergraduate Thesis of Wuhan University in 2020* Jan. 2020 - Jun. 2020
  - **Speech Synthesis:** Studied end-to-end speech synthesis models and designed a deep learning algorithm that uses inter-frame audio features for synthesized speech detection, achieving over 90% accuracy.
- **Deep Learning-based Deepfake Video Detection System** Wuhan, China  
*Second Prize, National College Student Information Security Contest* Jan. 2019 - Aug. 2019
  - **GAN-based Video Generation and Detection:** Utilized both temporal and spatial features from video streams for deepfake video detection, achieving over 96% accuracy.
- **Autonomous Vehicle Robotics Engineering** Singapore  
*Summer Workshop, School of Computing, National University of Singapore* Jun. 2018 - Sep. 2018
  - **Object Detection:** Developed a CNN-based object detection algorithm, achieving first place in the road test.

## KEY COURSES

- **Graduate Studies** Sep. 2020 - Jun. 2023
  - Learning from Data: 4.0/4.0
  - Optimization Theory and Machine Learning: 4.0/4.0
  - Advanced Signal Processing: 4.0/4.0
- **Undergraduate Studies** Sep. 2016 - Jun. 2020
  - Data Structures: 4.0/4.0
  - Probability Theory and Statistics: 4.0/4.0
  - Operating Systems: 4.0/4.0
  - Database Principles and Security: 4.0/4.0
  - Pattern Recognition: 4.0/4.0

## PUBLICATIONS

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(\* denotes equal contribution)

### REFEREED JOURNAL ARTICLES

- [1] SAFARI: Sparsity-enabled Federated Learning with Limited and Unreliable Communications  
**Yuzhu Mao\***, Zihao Zhao\*, Meilin Yang, Le Liang, Yang Liu, Wenbo Ding, Tian Lan, Xiao-Ping Zhang  
*IEEE Transactions on Mobile Computing (TMC)*, 2023.
- [2] AQUILA: Communication-efficient Federated Learning with Adaptive Quantization in Device Selection Strategy  
Zihao Zhao\*, **Yuzhu Mao\***, Zhenpeng Shi, Yang Liu, Tian Lan, Wenbo Ding, Xiao-Ping Zhang  
*IEEE Transactions on Mobile Computing (TMC)*, 2023.
- [3] Towards Efficient Communications in Federated Learning: A Contemporary Survey  
Zihao Zhao, **Yuzhu Mao**, Yang Liu, Linqi Song, Ye Ouyang, Xinlei Chen, Wenbo Ding  
*Journal of the Franklin Institute*, 2023.
- [4] Communication-efficient Federated Learning with Adaptive Quantization  
**Yuzhu Mao**, Zihao Zhao, Guangfeng Yan, Yang Liu, Tian Lan, Linqi Song, Wenbo Ding  
*ACM Transactions on Intelligent Systems and Technology (TIST)*, 2022.

### CONFERENCE PROCEEDINGS

- [6] FL-TAC: Enhanced Fine-tuning in Federated Learning via Low-rank, Task-specific Adapter Clustering  
Siqi Ping\*, **Yuzhu Mao\***, Yang Liu, Xiao-Ping Zhang, Wenbo Ding  
*International Conference on Learning Representations (ICLR) Workshop on Large Language Model (LLM) Agents*, 2024.

## AWARDS AND HONORS

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- Tsinghua Graduate Scholarship for Excellent Academic Performance (2020-2021 and 2021-2022, First-class, **Top 3%**)
- Wuhan University Scholarship for Outstanding Undergraduates (2020, **Top 3%**)
- **National Cyber Security Scholarship** (2019, **Top 1%**)
- **National Scholarship** (2018, **Top 1%**)
- Wuhan University Scholarship for Outstanding Students (2016-2017, 2017-2018, and 2018-2019, First-class, **Top 3%**)

## PROGRAMMING SKILLS

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- **Tools:** PyTorch, TensorFlow, Git, Linux                      **Languages:** Python, C, C++, Java, MATLAB, LaTeX

## LANGUAGE SKILLS

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- **English:** IELTS overall Band 8.0