YUZHU MAO

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EDUCATION

Tsinghua-Berkeley Shenzhen Institute, **Tsinghua University** Sept. 2020-June 2023

- Master of Engineering in **Data Science and Information Technology**; GPA: **3.85/4.0**
- Scholarship and Awards: Graduate Scholarship for Excellent Academic Research; Best Poster Award of the 2021 TBSI Workshop on Learning Theory (WOLT).

School of Cyber Science and Engineering, **Wuhan University** Sept. 2016-June 2020

- Bachelor of Engineering in **Information Security**; GPA: **3.87/4.0** (Graduate with Distinction)
- Scholarships and Awards: National Scholarship (top 1%); Cyber Security Scholarship (top 1%); Scholarship for Overseas Exchange Programs; First-class Scholarship for Outstanding Students; First-class Memorial Scholarship for Undergraduates.

ACADEMIC & RESEARCH EXPERIENCE

Efficient and Reliable Federated Learning System Sept. 2020-June 2023

Master's research topic co-supervised by Prof. Wenbo Ding and Prof. Yang Liu

- Studied deep learning theories and techniques that support efficient federated learning.
- Designed and implemented efficient algorithms for real federated system.

Deep Learning-based Text-to-Speech Synthesis System Jan. 2020-June 2020

Distinct Undergraduate Thesis of Wuhan University in 2020

- Studied several end-to-end speech synthesis models and designed a deep learning network based on inter-frame audio features to detect synthesized speech, achieving 90%+ accuracy.

A Self-driving Robotic Car Enabled by Sensors and Object Detection Algorithms June 2018-Aug. 2018

Summer Workshop, School of Computing, National University of Singapore

- Developed a data acquisition and a motion control module on Arduino, and passed the road test with the first place.

WORK EXPERIENCE

Research Assistant, Tsinghua-Berkeley Shenzhen Institute, Shenzhen, China Sept. 2023-Present

- Explored the efficient implementation of large language models on edge devices, e.g., robotics, while maintaining model generalization for personalized applications.

Research Intern, **Meituan**, Shenzhen, China June 2022-Sept. 2022

- Participated in the development of a 2D to 3D platform for large-scale UAV simulations, focusing on texture generation.

Research Intern, **Tencent Technology**, Shenzhen, China June 2021-Sept. 2021

- Participated in the development of an open-source JAX-based rigid body dynamics algorithm library, and contributing to the writing of technical documentation (https://github.com/Tencent-RoboticsX/jbdl).
- Provided guidance on implementing self-defined JAX operators on GPU through XLA.

PUBLICATIONS

Mao, Y., Zhao, Z., Yan, G., Liu, Y., Lan, T., Song, L., & Ding, W. (2022). Communication-efficient federated learning with adaptive quantization. ACM Transactions on Intelligent Systems and Technology (TIST), 13(4), 1-26.

Zhao, Z., **Mao, Y.**, Liu, Y., Song, L., Ouyang, Y., Chen, X., & Ding, W. (2023). Towards efficient communications in federated learning: A contemporary survey. Journal of the Franklin Institute (JFI), 360(12), 8669-8703.

Mao, Y., Zhao, Z., Yang, M., Liang, L., Liu, Y., Ding, W., Lan, T., & Zhang, X. P. (2023). SAFARI: Sparsity-enabled federated learning with limited and unreliable communications. IEEE Transactions on Mobile Computing (TMC).

Zhao, Z., **Mao, Y.**, Shi, Z., Liu, Y., Lan, T., Ding, W., & Zhang, X. P. (2023). AQUILA: Communication efficient federated learning with adaptive quantization of lazily-aggregated gradients. arXiv preprint arXiv:2308.00258. (accepted by TMC)

COMPETITIONS

Second Prize, National College Student Information Security Contest Jan. 2019-Aug.2019

- Proposed a deepfake video detection model using inter-frame optical flows as training features.
- Built a CNN to extract both the temporal and spatial features of video streams, achieving 96% accuracy.

ADDITIONAL

Skills: Python, C/C++, MATLAB, PyTorch, TensorFlow, MySQL, Overleaf.

Others: Piano Accompanist, Tsinghua & Peking Univ. Chorus; National Registered Volunteer of Young Volunteers Association.