Tian Liu

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Education

Ph.D., Computer Science, Texas A&M University, GPA: 4.0 — 2023 - now
M.S., Computer Science, Texas A&M University, GPA: 4.0 — 2020 - 2023
M.S., Petroleum Engineering, Texas A&M University, GPA: 3.9 — 2016 - 2019
B.S., Petroleum Engineering, China University of Petroleum Beijing, GPA: 3.8 — 2011 - 2015

Skills

- Python, C, C++, MATLAB, Fortran, SQL, HTML, JavaScript, CSS, Git, TensorFlow, PyTorch

Internship/Work Experience

System Software Intern*,* Storage Arcus and Primera Stack Team, HPE, Houston, Texas — Summer 2021, 2022
- Developed efficient tools (C) for searching structs and mapping admin space using page table walking
- Improved usage and efficiency (15× faster) of multiple Python extensions for faster debugging (C, Python)

Field Engineer, Measurements While Drilling Services, Schlumberger, Houston, Texas — 2019 - 2020
- Operated downhole tools to measure wellbore directions and interpret formation Gamma data for well placement

Research Experience

- **Computer vision (focus):** adapt *Vision-Language Models* to downstream tasks in zero-shot and few-shot setup
- **Cyber-physical systems**: computer vision for precision irrigation, voice assistant for emergency medical services
- **Applied machine learning**: apply machine learning to solve healthcare and geoscience problems

Graduate Research Assistant, Computer Vision Lab, TAMU, by Prof. Shu Kong — 2023 - now
- Analyzed failures of SOTA multimodal systems (e.g. GPT-4V); exposed imbalanced concept distribution in pretraining data; proposed REtrieval-Augmented Learning (REAL) for improving VLMs' zero-shot recognition
- Explored retrieval-augmented learning for few-shot recognition using VLMs; proposed Stage-Wise Augmented fineTuning (SWAT) to mitigate the imbalanced distribution and domain gaps issues, outperforming SOTA by >10%

Graduate Research Assistant, Embedded & Networked Sensor System Lab, TAMU, by Prof. Radu Stoleru — 2020 - 2023
- Developed precision irrigation system on Raspberry Pi 4 by estimating hyperlocal rainfall from doorbell cameras
- Developed end-to-end mobile voice assistant system to assist emergency medical services during disaster response

Graduate Research Assistant, Information & Operation Management Dept, TAMU, by Prof. Esmaeil Keyvan — 2023 - now
- Developed safe reinforcement learning algorithm for personalized medicine; tested on 12,501 ACCORD patients
- Developed Weibull and Cox-PH survival models for estimating CVD Risk using All-of-Us dataset (23,795) patients

Selected Publications

1. Tian Liu**,** Huixin Zhang, Shubham Parashar, Shu Kong. "Few-Shot Recognition via Stage-Wise Augmented Finetuning". (preprint)
2. Shubham Parashar*, Zhiqiu Lin*, Tian Liu* (*co-first authors), et al. "The Neglected Tails in Vision Language Models". CVPR 2024.
3. HM Abdullah, Tian Liu, et al. "UAL-Bench: The First Comprehensive Unusual Activity Localization Benchmark". WACV 2025. (under review)
4. Tian Liu, Liuyi Jin, et al. "ERIC: Estimating Rainfall with Commodity Doorbell Camera for Precision Residential Irrigation". BuildSys 2024.
5. Liuyi Jin, Tian Liu, et al. "EMSAssist: An End-to-End Mobile Voice Assistant at the Edge for Emergency Medical Services". MobiSys 2023.
6. Tian Liu, Ruxin Zhang. "A Machine Learning-based Hybrid Model for Fracture Parameterization and Distribution Prediction in Unconventional Reservoirs". Computers and Geotechnics, 2024.
7. Junyu Cao, Esmaeil Keyvanshokooh, Tian Liu. "Safe Reinforcement Learning with Contextual Information: Theory and Applications". 2023. (under review)

Selected Awards

- TAMU CSE Department Travel Grant, 2024
- TAMU CSE Department Graduate Teaching Assistant Excellence Award (1 each year), 2024
- 1st place of SPE Student Paper Contest in TAMU, 1st place in Gulf Coast Region, 3rd place in Global, 2018
- National Scholarship (highest honor in China), 2012