

## Education

<i>Ph.D.</i> , Computer Science, Texas A&M University, GPA: 4.0	2023 - now
<i>M.S.</i> , Computer Science, Texas A&M University, GPA: 4.0	2020 - 2023
<i>M.S.</i> , Petroleum Engineering, Texas A&M University, GPA: 3.9	2016 - 2019
<i>B.S.</i> , 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 system**: 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

## Publications

1. Tian Liu, Huixin Zhang, Shubham Parashar, Shu Kong. "Few-Shot Recognition via Stage-Wise Augmented Finetuning". arXiv.
2. Shubham Parashar\*, Zhiqiu Lin\*, Tian Liu\* (\*co-first authors), et al. "The Neglected Tails in Vision Language Models". CVPR 2024.
3. Tian Liu, Liuyi Jin, et al. "ERIC: Estimating Rainfall with Commodity Doorbell Camera for Precision Residential Irrigation". BuildSys 2024.
4. Liuyi Jin, Tian Liu, et al. "EMSAssist: An End-to-End Mobile Voice Assistant at the Edge for Emergency Medical Services". MobiSys 2023.
5. Tian Liu, Ruxin Zhang. "A Machine Learning-based Hybrid Model for Fracture Parameterization and Distribution Prediction in Unconventional Reservoirs". Computers and Geotechnics, 2024.
6. Tian Liu, Hongquan Chen, et al. "Integration of time-lapse seismic data using the onset time approach: The impact of seismic survey frequency". Journal of Petroleum Science and Engineering", 2020.
7. Junyu Cao, Esmaeil Keyvanshokoo, Tian Liu. "Safe Reinforcement Learning with Contextual Information: Theory and Applications". SSRN, 2023.

## Selected Awards

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