Zanhua Huang

EDUCATION:

- **Northwestern University,** Evanston, IL GPA: 3.97/4.00 Expected 2025
  Ph.D. in Computer Science
- **Rice University,** Houston, TX. GPA: 4.00/4.00 Dec 2020
  Master of Computer Science
- **University of Michigan,** Ann Arbor, MI. GPA: 3.81/4.00 May 2019
  Bachelor of Science in Engineering, Computer Science
- **Shanghai Jiao Tong University**, Shanghai, China GPA: 3.50/4.00 Aug 2019
  Bachelor of Science in Engineering, Electronic and Computer Engineering

WORK EXPERIENCE:

Intern, Amazon Web Service (AWS) Dallas, Texas Jun 2023 - Aug 2023

- Tasked with enhancing the security of AWS Secrets Manager and implementing an end-to-end security solution.
- Designed and developed the solution using the AWS Encryption SDK, incorporating RSA algorithms, and Libsodium, which utilized Elliptic Curve algorithms.
- Created client-side encryption tools in Python, Java, and a command-line interface (CLI).
- Developed a back-end decryption mechanism in Java for securely decrypting secrets.

PROJECTS:

I/O in WRF Northwestern University Sep 2022 - Apr 2023

- Compared and studied different I/O options in WRF and added a new I/O option (PnetCDF non-blocking) to WRF.
- Gained experience in using the supercomputers Cori and Perlmutter at NERSC, and also worked with the Slurm workload manager and the Lustre file system.
- Published paper: **Zanhua Huang**, Kaiyuan Hou, Ankit Agrawal, Alok Choudhary, Robert Ross, Wei-Keng Liao. *I/O in WRF: A Case Study in Modern Parallel I/O Techniques*. SC23.

HDF5 Plugin, Log Based VOL Northwestern University Feb 2022 - present

- Developed the subfile-read feature for Log-Based VOL, an HDF5 plugin optimized for handling substantial quantities of non-contiguous write requests. Utilized both collective and independent MPI-IO for the terminal VOL implementation and leveraged parallel HDF5 for the final VOL implementation.
- Maintain the GitHub repository for Log-Based VOL.

Distributed System Course Projects Northwestern University Feb 2022 - present

- Built a MapReduce system. Implemented worker processes that calls application Map and Reduce functions and handles reading/writing files, and a coordinator process that hands out tasks to workers and copes with failed workers.
- Implemented Raft, a replicated state machine protocol, using GoLang.

Inexact Bit Quantization For Neural Networks Rice University Mar 2020 - May 2020

- Proposed a novel quantization method to compress pre-trained neural networks. A compression ratio of 3x ~ 9x (no pruning) is achieved, without loss of accuracy.
- Used Tensorflow to calculate the partial derivatives to decide the bit-allocation of each network parameter.

OS Related Projects University of Michigan Sep 2018

- Built a Linux POSIX multi-threads library that implemented threads and monitors on single-processor systems.
- Built a memory space manager (a kernel pager) that manages the application process's virtual memory address space.
- Implemented a multi-threaded, secure network file server based on hierarchical file systems. Used read-write and hand-over-hand locking mechanism to ensure high accessing concurrency.

TEACHING ASSISTANTSHIP:

Applied Machine Learning in Python, at Coursera University of Michigan May 2018 - May 2019

- Answered students' questions in the course *Applied Machine Learning in Python*. Questions include topics in regressions, kernelized support vector machines, random forests, confusion matrix, data leakage, etc.

SKILLS:

- **Language:** native Chinese, working level of English, conversational Japanese.
- **Computer Language:** Python, C/C++, Go, Java
- **Misc**: High Performance Computing, Distributed Systems, MPI, MPI-IO, HDF5, netCDF, PnetCDF, Slurm, Lustre

HONORS:

- University of Michigan: Summa Cum Laude, Dean's List, University Honors, and James B. Angell Scholar.
- Shanghai Jiao Tong University: Dean's List, and University Honors.