

Shunyu Yao

shunyu@vt.edu | (+1) 434 466 6359 | shunyuyao515.github.io

EDUCATION

Virginia Tech, Blacksburg, VA, United States

Ph.D. Student, Computer Science

August 2020 - May 2025 (Expected)

University of Virginia, Charlottesville, VA, United States

Master of Computer Science (M.CS.), Computer Science

September 2018 - August 2020

BNU - HKBU United International College, Zhuhai, China

Bachelor of Science (B.S.), Computer Science and Technology

September 2014 - June 2018

PROJECT EXPERIENCE

Towards a Stateful Serverless Platform for HPC Applications

Distributed Systems & Storage Laboratory, Virginia Tech

September 2022 - Current

- Designing near-data scheduling for serverless workflows with in-memory caching intermediate states exchanged between memory intensive HPC serverless functions; Enabling native support for MPI on serverless platforms

Runtime-OS co-design for CXL memory system

Distributed Systems & Storage Laboratory, Virginia Tech

February 2023 - Current

- Extracting performance characteristics of memory-intensive applications through DAMON; Studying CPython object access tracking

Automated FaaSification of Monolithic Workloads

Distributed Systems & Storage Laboratory, Virginia Tech

March 2021 - January 2023

- Created a tool that automates the process of dynamically decomposing Python workloads into serverless functions that are deployment-ready with fine-tuned performance

Cyberinfrastructure for Waterborne Antibiotic Resistance Risk Surveillance

Distributed Systems & Storage Laboratory, Virginia Tech

September 2020 - May 2021

- Enabled flexible pipeline by refactoring components into serverless microservices

Checkpoint/Restart Containerized GPU Tasks

University of Virginia (Advisor: Dr. Andrew Grimshaw)

September 2019 - May 2020

- Evaluated existing attempts to capture out-of-kernel GPU states during runtime

Partitioned Parallel Processing Spaces (PCubeS)

University of Virginia (Advisor: Dr. Andrew Grimshaw)

October 2018 - May 2019

- Translated the serial C version of LULESH hydrodynamic model into PCubeS parallel programming language to test the correctness of PCubeS type architecture

Final Year Project: JavaScript Interpreter

BNU - HKBU United International College (Advisor: Dr. Philippe Meunier)

September 2017 - May 2018

- Implemented a partial JavaScript interpreter using Antlr4

WORK EXPERIENCE

Graduate Research Assistant

Distributed Systems & Storage Laboratory, Virginia Tech

September 2021 - Current

- Projects: Automated FaaSification of Monolithic Workloads; Stateful serverless Platform for HPC

Graduate Teaching Assistant

Virginia Tech

September 2020 - Current

- Teaching Assistant for Computer Organization (CS2506) and Computer Systems (CS3214)

Research Aide Intern

Programming Models & Runtime Systems Group, Argonne National Lab

June 2021 - August 2021

- Participated in developing OSHMPI, an implementation of OpenSHMEM on MPICH

Distributed Systems Intern

Lancium

June 2019 - August 2019

- Automated HPC resource management and task containerization using Ansible, Slurm, Docker and Singularity

PUBLICATION

Yuze Li, Shunyu (David) Yao. 2023. Understanding and Optimizing Serverless Workloads in CXL-Enabled Tiered Memory. Project Report, 8 pages. (pdf)

Shunyu (David) Yao, Muhammad Ali Gulzar, Liqing Zhang, Ali R. Butt. 2021. Towards a Serverless Bioinformatics Cyberinfrastructure Pipeline. In Proceedings of the 1st Workshop on High Performance Serverless Computing (HiPS '21), June 25, 2021, Virtual Event, Sweden. ACM, New York, NY, USA, 8 pages. <https://doi.org/10.1145/3452413.3464787> (pdf)

SKILLS

Programming Languages: Python, C/C++, Bash, MPI, OpenMP, CUDA, Matlab

Frameworks: Docker, Kubernetes, AWS, Slurm, Openwhisk, Memcached, Redis, Ansible, Singularity, Flask, Antlr4

Languages: English, Mandarin (Native Speaker)