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, Slurm, Openwhisk, Memcached, Redis, Ansible, Singularity, Flask, Antlr4
Languages: English, Mandarin (Native Speaker)