Vishwanath Seshagiri

vishwanath.seshagiri@emory.edu • Website • Distributed Systems Researcher @ Emory

Research Summary

Sixth-year Ph.D. candidate in Distributed Systems, specializing in kernel bypass operating systems to address Linux kernel limitations in high-load scenarios. Proficient in utilizing DPDK, SPDK, and specialized hardware to develop scalable I/O stacks for enhanced system performance. Currently leading two innovative projects: designing a zero-copy cache stack for optimized pinned memory usage, and reimagining the serverless network stack to improve efficiency in DAG-based architectures. Demonstrates expertise in tackling complex distributed systems challenges, with a focus on optimizing performance in demanding, high-throughput environments.

Work Experience

Applied Science Intern @ AWS May - Aug 2024
Worked with the S3 Express One Zone team for building and performance testing a read-only off-box metadata cache using Rust. Designed and implemented a prototype that reduced traffic to storage system by 60% on internal workloads.

Applied Science Intern @ AWS May - Aug 2022
Worked with the S3 Express One Zone on for developing an inode caching framework in Rust. Designed and implemented a prototype that reduced latency by 300% by using lock-stripping techniques that was the major bottleneck.

Research Intern @ Katana Graph Inc. May - Aug 2021
Architected, Developed and Deployed a product wide Distributed Tracing System by modifying OpenTracing and Jaeger. Collected traces to improve the query performance across different partitions by 10%.

Instructor @ Emory University Spring 2021
Responsible for teaching, and developing course material for CS130R Introduction to Python Programming Course. Received 85% student satisfaction rating in Course Evaluations.

Teaching Assistant @ Emory University Aug 2019 - Present
CS453 Security in Fall 2019, CS326 Algorithms in Spring 2020 and CS377 Databases in Fall 2022, CS584 Human AI Interaction in Fall 2023.

Python Developer @ UMM Digital Sep 2018-Jun 2019
Worked as a Python Developer for Review Management Platform called Zceppa that leverages reviews aggregated using Facebook Graph API, Google MyBusiness API and 10 other platforms. Scaled the system to handle 100+ small businesses.

Backend Developer @ Warhorse Education Pvt. Ltd. Aug 2017-Jun 2018
Worked as a Backend Developer for Internal Online Systems of Warhorse. Implemented Collaborative Filtering based Recommender System for Test Taking Module. Structured the Coding Course taught to Students.

Education

Emory University 2019 - Exp. Summer 2024
PhD in Computer Science @ SimBioSys Lab. *Commitee: Dr. Andreas Züfle, Dr. Ymir Vigfusson, Dr. Avani Wildani, Dr. Nosayba El-Sayed, Dr. Irene Zhang*

College of Engineering Guindy, Anna University 2014-2018
B.E. Computer Science and Engineering. Thesis: *Multi Instrument Music Generation using GANs.* PI: Dr. A.P Shanti

Publications

- **Vishwanath Seshagiri**, Siddharth Balyan, Vaastav Anand, Kausthub Dhole, Avani Wildani, Jose Cambronero, Andreas Züfle *Chatting with Logs: An exploratory study on Finetuning LLMs for LogQL. Under Review*
- **Vishwanath Seshagiri**, Abhinav Gupta, Vahab Jabrayilov, Kostis Kaffes, Avani Wildani *Rethinking the Networking Stack for Serverless Environments: A Sidecar Approach.* ACM Symposium of Cloud Computing (SoCC) 2024.
- **Vishwanath Seshagiri**, Darby Huye, Lan Liu, Avani Wildani and Raja Sambasivan *Identifying Mismatches Between Microservice Testbeds and Industrial Perception of Microservices.* Journal of Systems Research (Jsys) 2022.
- Pranav Bhandari, **Vishwanath Seshagiri** and Avani Wildani *Turning the Storage Hierarchy On Its Head: The Strange World of Heterogenous Tiered Caches. Under Review*
- **Vishwanath Seshagiri**, Raybuck, Deepti Raghavan, Pedro Henrique Peña, Amy Ousterhout, Simon Peter, Irene Zhang *Zero Copy Cache: Manipulating NIC TLB using Dynamic Pinning. In preparation*
- Vidya Janarthanam, V., **Vishwanath Seshagiri**, Shanthi, A.P. *A biologically plausible network model for pattern storage and recall inspired by Dentate Gyrus.* Journal of Neural Computing and Applications. 2020.

Projects

Observability Query Language Standardization PROJECT
A collaboration with the CNCF working group to standardize Observability Query Languages, developing an open standard that various tools can implement

Skills, and Tools

- **Tools & Platforms:** Python, C++, Rust, Docker, AWS, Azure, Linux, OpenTracing, Jaeger, Kubernetes, Jenkins, Terraform, Consul, Jaeger, DPDK, RDMA, Kernel-Bypass, Unikernels
- **Interests:** Distributed Systems, DevOps, Operating Systems, Microservices, Distributed Tracing, Caching, Programmable Hardware