Sahil Bhalchandra Purohit

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EDUCATION

North Carolina State University, Raleigh, NC, USA August 2023 – May 2025

Master of Science, Computer Science GPA: 4/4

Coursework: Algorithms, Operating Systems, Internet Protocols, Cloud Computing, Switch Network Management

Visvesvaraya National Institute of Technology, Nagpur, India July 2019 – May 2023

Bachelor of Technology, Computer Science GPA: 9.17/10

Coursework: Data Structures, DBMS, AI, ML, Graph Theory, Parallel Computation, Distributed Systems

SKILLS

- **Languages:** C, C++, Java, Python, Kotlin, SQL, HTML, CSS, Javascript
- **Frameworks/Libraries:** ReactJS, NodeJS, SpringBoot, Flask
- **Databases:** MySQL, MongoDB
- **Computer Network:** TCP/IP, LAN, VLAN, STP, Load Balancing, HTTP, Socket Programming
- **Other skills:** QEMU/KVM, Docker, Packet Tracer, NS-3, Markdown, Linux shell, git, bash

EXPERIENCE

North Carolina State University, Raleigh, NC, USA

Research Assistant September 2024 – Present

- Focusing on MS thesis work under the guidance of Dr. Jianqing Liu, exploring congestion control in HPC Environment.
- Extending the research from the Article "Proactive Congestion Avoidance for Distributed Deep Learning".
- Analyzing recent advancements in congestion control algorithms and their application in high-performance computing (HPC) settings.

Tata Consultancy Services, Pune, India

Software Engineering Intern May 2022 – July 2022

- Engineered and incorporated a Python-based automation tool into a web solution, streamlining key processes and significantly boosting operational efficiency.
- Architected robust backend services utilizing Java Spring Boot and revamped frontend interfaces with ReactJS, resulting in enhanced system usability and improved user experience.

PROJECTS

VirtShield: Evaluation of Firewall Performance on Virtual and Container Systems September 2024 – Present

- Designed independent topologies using Docker and QEMU to evaluate firewall performance in virtual machines and container environment.
- Configured traffic flow from client to server through firewall and assessing its performance under various benchmark-generated workloads.
- Analyzing firewall resource utilization and network performance across different environments to provide insights into workload impacts.

Analysis of TCP Variants and Application Layer Protocols January 2024 – August 2024

- Worked under the guidance of Dr. Jianqing Liu to replicate and evaluate TCP variants like TCP CUBIC, DCTCP and BBR using the ns-3 simulator. Built the dumbbell topology to compare performance, providing insights into network optimization.
- Developed Client-Server Models for HTTP 1.0, HTTP 2.0, and gRPC protocols, along with a Peer-to-Peer Model for the BitTorrent Protocol in Python, facilitating secure and efficient file transfers.

Advanced Scheduler Implementation and Memory Virtualization in Xinu OS August 2023 – December 2023

- Implemented an Exponential Distribution-based scheduler and a Linux-like scheduler for Xinu OS in C programming language, improving process management and enhancing system responsiveness through efficient task prioritization and execution.
- Developed a comprehensive Memory Virtualization system with a 2-level Paging, Page Fault Handler, backing storage and Disk storage Implementation, enhancing memory management efficiency and better resource utilization

Automated Interview System with NLP-Based Recommendation Engine July 2022 – April 2023

- Built a backend system using Flask to automate the interview process, streamlining candidate assessment.
- Integrated an NLP-based recommendation system, improving the accuracy and relevance of candidate recommendations.
- Published findings in a paper at the PCEMS 2023 conference, presenting research to industry experts and academics.