

Shanmukha Subrahmanyam Rallapalli

srallapalli@binghamton.edu | (607)-788-0415 | LinkedIn: [linkedin.com/in/shanmukha20](https://www.linkedin.com/in/shanmukha20) | GitHub: [Shanmukha2031](https://github.com/Shanmukha2031)

EDUCATION

Binghamton University, State University of New York

Binghamton, New York

M.S. in Computer Science

Expected Graduation, December 2025

- **GPA:** 3.5/4.00
- **Related Coursework:** Design Analysis & Algorithms, Programming Languages, Systems Programming, Programming systems and tools, Distributed Systems, Design Patterns, Object-Oriented Programming

SKILLS

Programming: Java, Python, MATLAB, C++, C, Embedded C

Protocols and Interfaces: Socket Programming, Internet Protocol Suite (TCP/IP), ICMP, ARP, MAC/RLC/PDPC, 802.11(a/b/g/n/ac)

Tools and Technologies: Android Studio, PyTorch, Eclipse, Git, WireShark, Vim, GCC, GNU Make, JIRA, Jenkins, Linux Kernel

EXPERIENCE

Capgemini

Bengaluru, India

Software Development Engineer

June 2022 – Dec 2023

- Analyzed and optimized Wi-Fi application software layers, specifically targeting the interface between the UI and lower Wi-Fi stack, using tools such as Wireshark and GDB for seamless communication and performance optimization.
- Executed hardware-software integration tests and conducted Root Cause Analysis on STA/P2P/AP roles, using Linux command-line tools and custom scripts to diagnose and resolve defects, ensuring proper functionality and robust performance across Wi-Fi software layers.
- Reproduced customer-reported issues using Jenkins and in-house testing frameworks for sanity and unit testing, and integrated vendor-provided fixes to enhance compatibility and performance within the Wi-Fi stack.

Capgemini

Bengaluru, India

Software Development Engineer Intern

Mar 2022 – Jun 2022

- Performed detailed analysis of WLAN 802.11a/b/g/n/i and P2P specifications, conducting a functional breakdown of WLAN drivers to map and optimize communication flows.
- Executed packet capture and analysis on WLAN devices using tools like Wireshark, validating WLAN specification compliance and troubleshooting communication issues
- Mapped and optimized the Linux WLAN stack architecture, detailing interactions between wpa_supplicant, hostapd, nl80211, cfg80211, mac80211, and ath9k driver to enhance performance and reliability.
- Implemented and tested socket programming using the TCP/IP protocol suite, leveraging Unix system calls for network communication and debugging.

PROJECTS

Custom Kernel Development and Virtual File System Implementation

Binghamton, New York

C, Kernel Programming, File Systems, Memory Management

Jan 2024 – Mar 2024

- Developed kernel processes and threads using C, with emphasis on thread manipulation, synchronization, and context switching.
- Constructed a Virtual File System (RAMFS) with implemented system calls and polymorphism to manage file operations efficiently.
- Implemented virtual memory management, including creating a virtual address space, page fault handler, and user-space shell using shadow objects.

Reinforcement Learning-based Cluster Formation in Ad-hoc Networks

Hyderabad, India

Python, Reinforcement Learning, Network Simulation

Apr 2023 – Jun 2023

- Engineered communication protocols for multi-agent systems in ad-hoc networks without pre-existing wireless infrastructure using Python.
- Implemented a reinforcement learning algorithm using PyTorch to optimize cluster formation among agents based on stable communication channels.
- Developed a simulation environment using NS3 to model multi-agent systems, enabling testing and training of the learning algorithm across various agent trajectories.

ACTIVITIES AND LEADERSHIP

Peer Success Coach

Binghamton, New York

Graduate Assistant

Feb 2024 – Current

Provided support, accountability, and guidance to students through one-on-one, in-person, and virtual academic success coaching appointments and evaluated on a semesterly basis to set and achieve individual goals.