VIDEET SINGHAI

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OBJECTIVE

To design and build robust systems in a top company as a Software Engineer (seeking **permanent employment**).

EDUCATION

Carnegie Mellon University, Pittsburgh — Aug '19 - May '21
Master of Science, Information Networking (CGPA : 3.5/4)
Courses: Operating Systems Design and Implementation (15-410), **Storage Systems** (18-746), **Embedded Systems**, (18-349)Computer Systems (15-513), Distributed Systems, Introduction to Machine Learning (10-601)

Sardar Patel Institute of Technology, Mumbai — Aug '14 - May '18
Bachelor of Engineering, Information Technology (CGPA : 8.24/10)

SKILLS

Languages: C, x86 assembly, ARM assembly, Java, Python
Tools and Frameworks: GDB, Shell Scripting, AWS, Wireshark, Git, Make

PROFESSIONAL EXPERIENCE

Qualcomm Innovation Center (Software Engineer Intern, San Jose) — May '20 - Aug '20
Multithreading | C

- Designed a reference counting solution to handle system resources for next generation **network accelerated OS**.
- Implemented **multithreaded kernel APIs** for reference counting, which made the system design dynamic.

National University of Singapore (Research Assistant, Singapore) — Sept '18 - Jun '19
Intel SGX, DPDK, Snort, OpenSSL | C, C++, JavaScript

- Contributed 4000+ lines of C/C++ code to R&D of a network infrastructure design for enterprises.
- Developed a secure accelerated network processing framework using Intel SGX and Data Plane Development Kit (DPDK).
- Performed bug fixes and developed modules like TCP reassembly, UDP wrapper for **Intel's Snort-SGX (Open Source)**.

Nvidia (Software Engineer Intern, India) — June '17 - Aug '17
Grunt, Git | AngularJS

- Developed customizable services for GeForce Experience to help the team build new services easily on top of it.
- Built libraries to fetch gaming videos and live streaming based on user gaming history.

ACADEMIC PROJECTS

Unix-Inspired kernel from scratch | x86 assembly, C

- Designed and Implemented a **robust preemptive x86 kernel**.
- It supports **virtual memory**, multi-tasking, multi-threading and context-switching, exception/interrupt handling etc
- Implemented process/thread management system calls like **fork, exec, wait**, yield etc.
- Implemented drivers for timer, keyboard and console.

CloudFS - A Hybrid File System | C++

- Built a file system using the FUSE interface in C++, integrating local SSD and S3 storage.
- Implemented a block-level deduplication, write-back caching to save storage and network cost.

Raft Consensus Algorithm | Go

- Implemented a distributed system with multi-threaded concurrent leader election, log consistency and robustness in case of leader/follower crashes, network latency, network partitions.

Userspace Thread Library | x86 assembly, C

- Designed and implemented a thread library with thrad management primitives like create, join, yield etc.
- Implemented synchronization primitives such as mutexes, condition variables, semaphores, reader/writer locks etc.

Real-Time Embedded Kernel | ARM assembly, C

- Constructed a kernel capable of real-time scheduling (Priority Ceiling Protocol).
- Implemented system calls for sbrk, thread context switching, thread control blocks, kernel stacks, and mutexes.
- Wrote device drivers for UART, I2C to control servo motors and read values off sensors.

Flash Translation Layer | C++

- Implemented an address translation layer to translate logical address to physical address for SSD firmware.
- Used page mapping, garbage cleaning to reach good effect on write amplification, endurance and memory usage.

OTHER ACTIVITIES

- Teaching Assistant at Abhyudaya (NGO) and prepared underprivileged children to compete in National level exams
- Ranked 13th in India, in the IEEE Xtreme International 24 hrs Programming Competition.