Marvin Jirapongsuwan

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Education

University of Michigan — **Ann Arbor, MI**
B.S.E. in Computer Science, Minor in Business — *May 2026*

- **GPA:** 3.80/4.00
- **Awards:** Walter G. Mitchell Memorial, Oskar and Elsie R. Loosme, Dean's List, University Honors
- **Relevant Courses:** Data Structures & Algorithms, Operating Systems, Distributed Systems, Computer Organization, Web Systems, Computer Security

Technical Skills

Languages: C++, C, Go, Python, JavaScript, Bash, SQL, Lua, MATLAB
Systems: Linux, Unix, POSIX, ZFS, ext4
Technologies: React, Next.js, FastAPI, Node.js, MongoDB, PostgreSQL, Git, Make, Apache Kafka, GDB

Experience

Viam — **New York, NY**
Incoming Software Engineer Intern — *August 2026*

Nutanix — **San Jose, CA**
Software Engineer Intern — *May 2025 – August 2025*

- Spearheaded async I/O integration into core network file server (Ganesha NFS) using shared ring buffers (io_uring), cutting userspace threads by 68%, improving bandwidth (+14.6%) and latency (-31%) on batched, high latency workloads
- Modified internal file system (ZFS) for correct io_uring integration, enabling ARC-cache-aware, io_uring-driven kernel thread dispatch that achieved 27x parallel I/O scaling (32-core cluster) and reduced redundant thread creation by 61%
- Evaluated io_uring performance & behavior on Linux file systems using Fio across I/O patterns, tracing with bpftrace/kprobes
- Built custom benchmarking suite for io_uring designs, measuring I/O bandwidth and latency to guide NFS design integration

Joy of Coding (University of Michigan) — **Remote**
Teaching Assistant (TA) — *May 2025 – August 2025*

- Supported ∼400 students in an online Python course in weekly 1-on-1 Zoom and email support
- Mentored students on programming basics (functions, conditions, loops), AI fundamentals, and data visualization

UM Direct Brain Interface Lab — **University of Michigan**
Undergraduate Research Assistant — *September 2024 – May 2025*

- Developed EEG-based BCI applications in C++ for individuals with motor impairments to communicate via brain signals
- Improved AAC-BCI keyboard reliability with core bug fixes and error checks, reducing visual and hardware failures by 30%
- Enhanced Choice-Making module with stimuli-skipping, and refactored algorithms to improve response time and flexibility

Projects

Nutanix Pinsir Security | *React, Flask, ClamAV, PostgreSQL, Nutanix Objects, Apache Kafka*

- Built a real-time malware scanner for S3-compatible storage with a Flask REST API and Kafka-backed pipeline, enabling async file scanning with ClamAV, securing 98% of stored objects and reducing processing time by 90%
- Designed security features including scan-gating, S3 tag-based access control, and audit logging with PostgreSQL
- Led React frontend integration with backend APIs for upload, retrieve, and download workflows

Sharded Key/Value Service | *Go, Paxos, RPC, Distributed Systems*

- Built a fault-tolerant sharded key/value store in Go, enabling dynamic shard migration across Paxos-replicated replica groups
- Implemented a Paxos-replicated shard master to manage configuration changes, atomic two-phase shard migration, and bounded-memory deduplication, ensuring linearizable Get/Put/Append and shard-migration operations via coordinated log entries

Multithreaded Network File Server | *C++, Boost Library, Threads, Sockets*

- Implemented a heavily concurrent, crash consistent network file server supporting multiple users and nested file/folder structure
- Utilized committing writes to enable crash consistency, Boost threads and upgradeable reader-writer locks to optimize for maximum concurrency, and POSIX sockets to enable network communication with clients

Thread Library | *C++, Multi-threading, Mutexes, Condition Variables, Semaphores, Unix*

- Developed a kernel C++ thread library on Unix, handling CPU booting, thread management, management of 50+ CPUs, interrupts, atomicity, and FIFO scheduling order
- Designed spin-locks, mutexes, conditional variables utilizing advanced Unix context management

Other

Interests: Filmography/Video Editing, Gunpla Building, Volleyball, Basketball