

# Ayush Koul

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## EDUCATION

### San Jose State University (SJSU)

San Jose, CA

Master's in Computer Science

August 2023 - May 2025

- Relevant Courses:** Topics in Machine Learning, Server-Side Web Programming, Adv. Parallel Processing

### Graphic Era University

Dehradun, India

Bachelor's in Computer Science (GPA: 3.8 / 4.0)

August 2018 - June 2022

- Relevant Courses:** Design and Analysis of Algorithms, Data Structures in C, Cloud Computing

## TECHNICAL SKILLS

### Programming Languages

C++, Python, Java, Rust, C#, HTML, CSS, JavaScript/TypeScript, SQL

### Frameworks/Tools

React.js, Next.js, Node.js, Flask, .NET, Git, Docker, CUDA, Unity

### Databases

MongoDB, MySQL, PostgreSQL, Firebase

### Cloud Platforms

Azure, AWS, GCP

### Operating Systems

Linux, Unix, Windows, iOS, Android

### Certifications

Microsoft AZ-900, Microsoft DP-900

## WORK EXPERIENCE

### San Jose State University Research Foundation

San Jose, CA

Graduate Research Assistant

December 2023 - Present

- Porting weather models for the Wildfire Interdisciplinary Research Center written in C++ on the CPU to the GPU using OpenAcc and CUDA with up to 100x performance gains (benchmarked on A100 and GH200)
- Utilized MPI and OpenACC for multi-GPU programming and distributing work over several GH200 GPUs
- Trained a custom in-house UNet model using PyTorch from 10,000+ satellite samples with a 30% improvement in weather prediction

### Johnson & Johnson (Medtech)

Santa Clara, CA

Software Engineering Intern

June 2024 - August 2024

- Implemented critical non-product software for high-priority Ottawa Project
- Re-architected the build system for their Python monorepos achieving 8x performance improvement
- Engineered custom Python plugins for pex file management with proprietary artifactories
- Conducted in-depth research on advanced optimization techniques, including remote caching, resulting in a 70% reduction in CI/CD build times and costs

### Samsung Research

Bangalore, India

Software Engineer

August 2022 - July 2023

- Programmed an XR Input Simulation tool in Unity for device-agnostic testing, decreasing development time by 80% and expediting project delivery
- Developed a Unity package with 25+ reusable UI components and development tools for XR developers
- Architected a scalable native Android camera service using Google's Camera2 API and HAL (Java, C++) with multi-threaded client requests and shared memory for a 65% increase in system performance
- Built a real-time camera frame visualization and performance analysis tool using OpenCV adopted by 4 departments and 60+ employees for advanced insights and debugging

## PROJECTS

**Intel 8085 Emulator** - An 8085 microprocessor emulator in C++ that supports all opcodes in an 8085 chip with a desktop GUI application that allows users to analyze memory, register, etc.

**CppML** - A C++ Machine Learning library from scratch that includes models for Regression, KNN, K-Means, Hidden Markov Models, and Neural Networks.

**Programming Language Interpreter** - An object-oriented, dynamically typed programming language that supports Variables, Loops, Conditionals, Functions, Data Structures, Classes, Closure, Inheritance, etc.