

# Arpan Swaroop

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## EDUCATION

### University of Illinois at Urbana Champaign

Urbana Champaign, IL

*B.S. Computer Engineering, Grainger College of Engineering*

*Aug. 2021 – May 2025*

**Relevant Coursework:** Computer Systems Engineering, Database systems, Intro to Artificial Intelligence, Multimedia Signal Processing, Digital Signal Processing, Data structures and Algorithms

## TECHNICAL SKILLS

**Languages:** Python, C/C++, SQL (MySQL), JavaScript, HTML/CSS, System Verilog, x86 asm, Golang, Rust

**Technologies:** Node.js, Express, Google Cloud Platform, ROS, Nav 2, pandas, Matplotlib, FPGA

**Developer Tools:** Git, Docker, NeoVim, Linux(Ubuntu)

## EXPERIENCE

### Web Developer Intern

Jun 2024 – Aug 2024

*Avermatix LLC.*

- Redesigned landing page to include more modern and minimal UI/UX using Figma
- Implemented these changes using HTML/CSS and Javascript on the frontend
- Created a custom form, and connected it to a REST API written in Java using the Spring Boot framework
- Architected the integration of a relational database, designing the schema, and writing custom queries to handle user data for 100s of users
- Wrote a comprehensive business report about the impact of generative AI on low-code app building services

### Research Assistant

Feb 2023 – Aug 2023

*Advanced Controls laboratory*

- Implemented path planning algorithms in quad-copters, to allow for autonomous flight
- Developed these algorithms using Euclidean signed distance fields for fast and flexible local planning
- Implemented the rapidly exploring random trees algorithm for efficient path planning
- Utilized **ROS** to integrate the depth sense cameras used for localization and planning
- Developed on the Nvidia Xavier nx platform

## PROJECTS

### Unix Like 32-bit x86 Operating System | *C, x86 asm*

- Architected a minimalistic multitasking operating system for x86 hardware, prioritizing efficiency and reliability
- Devised an interrupt-driven, time-slice-based CPU scheduling algorithm to schedule process execution
- Supported virtual memory using paging data-structures
- Developed a custom filesystem that supports basic file operations, utilizing storage, and I/O principles
- Implemented device drivers for keyboard, Real Time Clock, Programmable Interrupt Controller, and Programmable Interval Timer

### Game Developer's toolkit | *Javascript, HTML, CSS, Node.js, Express, MySQL, Python*

- Developed full-stack web application using a steam game database to help game developers
- Implemented multiple advanced queries to the database to output useful information for game developers
- Implemented interactive graphs in **Python**, showing helpful patterns in game data across all steam games
- Added features to enable user sign in and login, and the ability to add other users as friends
- Utilized a **REST API** made with **Node.js** and **Express**
- Hosted website on the Google Cloud Platform

### Chip-8 Emulator and Microcontroller port | *Rust, C*

- Developed a Chip-8 emulator in Rust, Engineered to be resource-efficient, optimizing for constrained environments
- Ported the emulator to an ARM Cortex-M4 microcontroller, adapting Rust code for embedded systems
- Implemented I/O functionality on the microcontroller, managing keyboard input and display output via **SPI** interface
- Ensured real-time performance and responsiveness by utilizing hardware timers and **interrupt-driven** design

### Chat-App | *Golang, javascript, HTML, CSS*

- Created a simple chat-app utilizing a backend http web-server written in Go
- Utilized **web-sockets** with **Go-routines** and **Go-channels** to allow multiple users to connect to the server
- Utilized javascript, HTML, CSS to create dynamic webpages served from the web server