Nihaar Gopalji

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Education

University of Michigan, *Ann Arbor, MI* **August 2021 – December 2025**
B.S.E. in Computer Science ***GPA:*** *3.99/4.00*
B.S.E. in Mechanical Engineering

- **CS Coursework**: Data Structures and Algorithms, Web Systems, Computer Organization, Computer Science Fundamentals, Programming and Data Structures, Discrete Mathematics, Linear Algebra, Design and Manufacturing

Experience

CandleStick, *Remote* **January 2024 – Current**
Backend Developer

- Developing a scalable **Firebase backend** for an AI-powered brokerage app's **user referral system**, integrating universal deep links to distribute free stocks to participants. Deploying the feature to user base of over 1000.

Michigan Strength Augmenting Exoskeleton, *Ann Arbor, MI* **September 2023 – Current**
Software Engineer

- Developed and trained a **Support Vector Machine (SVM)** algorithm on a dataset of over 200,000 IMU motion data points, successfully predicting powered exoskeleton wearers' movements with **80% accuracy**.
- Designed an efficient **machine learning data pipeline** for cleaning, transforming, and extracting relevant features from high-volume data sets in real-time with the **sliding window technique**.

Stryker, *Kalamazoo, MI* **May – August 2023**
R&D Mechanical Engineering Intern

- **Packaging Optimization:** Redesigned housing for electronics and air compressors within Stryker's IsoTour Mattress, reducing bed vibration by 86% and unanimously selected as most comfortable design by internal testers.
- **Post-Market Engineering:** Eliminated a defect of an externally supplied assembly. Identified root causes through stack-ups and defect testing, and collaborated with global teams to resolve assembly issues at Mexico supplier plant.

Projects

Instagram Clone **January 2024**
Flask, SQLite, JavaScript, REST API, HTML/CSS, AWS, Git

- Designed and deployed a full-scale Instagram Clone using **Flask and SQLite**, featuring dynamic **server-side** and **client-side pages** with JavaScript; integrated a **REST API** and AJAX for enhanced interactivity and data handling.
- Deployed the application on **AWS**, adhering to web application **security principles** through comprehensive user authentication, input validation and sanitization, and robust session management.

MST/TSP Solution Generator, *C++* **December 2023**

- Developed an implementation of **Prim's algorithm** to efficiently find **minimum spanning trees** for complete graphs
- Utilized **arbitrary insertion** heuristic approach to generate approximate solutions for the **traveling salesperson problem** with quadratic time complexity, allowing for computation for **+10,000-order** complete graphs in seconds
- Created a **branch and bound** algorithm to guarantee optimal solutions to the traveling salesperson problem and optimized via **solution tree pruning**, using MST-derived upper bound, reducing runtime by **90%**

Automated Disinfection Device, *UofM Multidisciplinary Design Program* **September - December 2023**
C++, Arduino

- **System Design:** Led a team of 5 student engineers to design and manufacture a proof of concept prototype that disinfects Stryker's Altrix device through water pasteurization, overseeing mechanical, electrical, and software elements.
- **Device Automation:** Developed an Arduino-based control system to automate a complex four-stage disinfection process by regulating pumps, heaters, and valves, responding to real-time data from temperature, pressure, and flow sensors.

Technical Skills

Languages: C++, C, Python, JavaScript/TypeScript, HTML/CSS, SQL, LaTeX
Tools: Git, Firebase, Flask, AWS, REST API, PyTest, React, Pandas, NumPy, Scikit-learn