

# Nihaar Gopalji

linkedin.com/in/nihaar-gopalji • nihaargopalji.com • ngopalji@umich.edu • (908) 723-6954

## 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

Michigan Strength Augmenting Exoskeleton, Ann Arbor, MI

September – December 2023

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.
- **Rapid Mechanism Prototyping:** Developed a compact pedal mechanism that responds to 6 unique combinations of foot forces and positions, allowing users to control electronic actuators on next-gen Stryker stretchers intuitively.
- **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

CleanCare - Device Management Application

January 2024

MongoDB, Express.js, Node.js, React, Docker, JWTs, Git

- Developed **scalable** hospital management application utilizing **MERN stack** (MongoDB, Express.js, React, Node.js).
- Designed a system to efficiently manage the disinfection, maintenance, and patient scheduling of thousands of medical devices and facilitate the training of large hospital staff through secured staff access.

MST/TSP Solution Generator

December 2023

C++

- 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++, Python, JavaScript/TypeScript, HTML/CSS, SQL (SQLite), LaTeX

**Tools:** Git, Docker, Jenkins, Jupyter Notebook, MongoDB, Pandas, NumPy, Scikit-learn