

# SANJAY MOHAN KUMAR

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## EDUCATION

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### George Mason University

Pursuing Bachelor of Science in Computer Science

Relevant Coursework: Data Structures, Low-Level & Systems Programming

Awards/Certifications: Dean's List, Microsoft Office Specialist Expert

Fairfax, VA

Exp. Graduation: Dec 2025

## SKILLS

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**Programming** Java, Kotlin, Python, C/C++, Linux/Unix, R, OOP, Optimization

**Technology** Git, vSLAM, OpenCV, TensorFlow, Valgrind & GDB, JIRA

**CAD** Onshape, Fusion360, 3D Printing, Rendering, Surface Modeling

**Hardware** Microcontrollers, Embedded Systems, PCB Design, IoT

**Robotics** FSM, Control Systems, Motion Planning, Kinematics

## EXPERIENCE & LEADERSHIP

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### FIRST Alumni Association, Vice President

Oct 2022 - Present

- Led STEM-focused club as Vice President role, organizing FIRST robotics events and community outreach to drive interest in robotics and STEM related fields.
- Helped lead "Spring into STEM" community event at GMU which promoted STEM to students K-12th in the DMV area, with roughly 300-500 participants.

### GMU Undergraduate Teaching Assistant

Aug 2023 - Present

- Supported roughly 200+ students each week in topics of Low-Level C Programming and Unix fundamentals.
- Supported GTAs and Instructors during weekly labs and Lecture classes, Code reviewed and provided intuitive constructive feedback for Labs and Programming Assignments.

## PROJECTS

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### Smart Signal: C/C++ | Arduino

Aug 2017 - Dec 2017

I created an intelligent traffic intersection prototype, using ultrasonic sensors to dynamically prioritize the green light to the busiest lane, ultimately reducing traffic and making the traffic light system more efficient. This project gained recognition for seamlessly integrating hardware and software solutions to address practical problems through innovative technology.

### Finite State Machine Builder: Finite State Machines

Jan 2022 - Apr 2023

An extremely robust software library, I created and rigorously tested, to make creating and modeling Finite State Machines easy. Its potential to be embedded into any software system is made possible by a unique plug-and-play style interface. This system efficiently transitions between program states while preserving context variables.

### Dynamic Sensor Localization: Real-World Localization | Sensor Fusion

May 2022 - Jun 2023

Intuitive software algorithm I created, that polls ultrasonic pulses to fixed objects to derive a relative real-time 2d vector position. The algorithm efficiently polls sensors on an "as needed" basis, which significantly increases system responsiveness. Additionally, any outliers in data that is polled are intelligently filtered out.

### AlphaLib Robot Software Library: Control Systems | Trajectory Generation

Jun 2021 - Jun 2023

Founded and led the development of an all-in-one software package, that makes programming FTC robots easier and highly efficient. Several control theory concepts are skillfully implemented, such as Trajectory Generation & Following, Open & Closed Loop Control Systems, Object Classification, Logic Controllers, and Systems Programming.