Sujjay Karthikeyan

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Skills

Languages Java, C++, Python, Linux, Git, AWS
CAD Inventor, Creo, Onshape, SolidWorks
Software Microsoft Office, ROS2, OpenCV, ROS, Gazebo, Matlab, Arduino, SLAM, Simulink

Experience

Kathedra **June 2026 – Present**
Robotics Engineering Intern

- Sized motor and controller for a rack-and-pinion gantry against a 385 N force ceiling; caught a firmware mismatch in the initial vendor selection that would've broken ROS2 integration before it was ordered
- Designed a custom shaft bushing to fix a metric/imperial mismatch between motor and gearbox, with a toleranced drawing for in-house machining
- Traced a 1.1 mm/cycle drift in an indexing mechanism to a gear pitch mismatch; fixed it by reworking tooth count and pitch radius

SmartNet Lab **July 2025 – Present**
Research Assistant

- Built a three-drone autonomous coverage simulation in ROS2/Gazebo using the MRS UAV System (Apptainer container, Ubuntu 24.04), including a custom Gazebo world with 25 ground targets.
- Implemented a Deep Q-Network coverage policy; diagnosed a convergence plateau by identifying the task as a static placement problem rather than a sequential decision process, built a grid-search optimizer as a benchmark achieving 76 percent coverage
- Co-authoring a paper on this work for the AIAA SciTech 2027 Student Paper Competition (Uncrewed and Autonomous Systems track)

InspireNC **Jul 2023 – Present**
Director

- Made a yearly budget for Non-Profit, analyzing trends from previous years
- Conducted networking events with local companies such as Stemarga and Accenture to learn business strategy
- Raised 35K over 6 months through grants, fundraisers, and donations
- Hosted Workshops regarding fundraising and business strategy to newly established non-profits
- Partnered with Metlife, US Air Force, Lenovo to spread engineering education to children

Education

University of North Carolina at Charlotte **Aug 2024 – May 2028**
Bachelor of Science in Mechanical Engineering and Physics
Relevant Coursework

- Dynamics, Mechatronics, Circuits/Electronics, Data Structures & Algorithms, Thermodynamics II, Design/Tolerance, Differential Equations

Projects

Autonomous Tilt-Rotor VTOL UAV Design **Dec 2025**

- Engineered a custom **2-axis tilt-rotor mechanism** capable of 90-degree transition for VTOL operations; designed interference-free sub-assemblies integrating bearings, servos, and carbon fiber structural elements
- Optimized the airframe for **Design for Additive Manufacturing (DFAM)**, utilizing shelling, offset split-planes, and tolerance analysis to ensure successful FDM printing of thin-walled structural components.

NASA Space to Soil Challenge **March-May 2026**

- Designed an adaptive SmallSat + drone swarm concept for soil health monitoring: onboard edge AI flags anomalies from NASA HLS/SMAP data and downlinks only a lightweight cue packet, triggering a coordinated drone fleet for ground-truth verification
- Built a React-based demonstrator dashboard simulating the 2012 Midwest drought scenario to visualize the detection-to-response pipeline