Raghav Kumar Agarwal

Boston, MA | agarwal.rag@northeastern.edu | +1 (857) 339-9025 | LinkedIn | Portfolio

Education

Northeastern University (NEU), Boston, MA **December 2026**
Master of Science in Robotics (Concentration – Mechanical Engineering)
Coursework – Robotics Systems and Navigation, Robotic Science and Systems, Control Systems Engineering, Mobile Robotics

Vellore Institute of Technology (VIT), Vellore, Tamil Nadu, India **June 2024**
Bachelor of Technology (Concentration – Mechanical Engineering)
Coursework - Automotive Electronics, Statistics, Mechatronics System Design, Rapid Manufacturing, New Product Development

Awards

- **Piezoelectric Load De-Coupler** – Won The Meritorious Award at IANC (Industry Academia Networking Conclave) organized by Honeywell, India
- **Micro class plane with autonomous payload delivery** – 3rd place in AEROMANIA (Organized by ASME - American Society of Mechanical Engineers, India)

Skills

Programming: Python, C/C++, MATLAB, CUDA, Verilog, Bash, ROS 2, OpenCV, SLAM, PID, Kalman Filters, MoveIt, NAV2, Linux, Git, Microsoft Office
Hardware: Raspberry Pi (3/4/Zero), Arduino, Pixhawk, ArduPilot, GPS, IMU's, IoT Devices, Motion Control
Industrial Applications: SolidWorks, Autodesk Fusion 360, AutoCAD, MATLAB Simulink, Docker, Rapid Prototyping, 3D Printing, CNC Machining
Certifications: SolidWorks Mechanical Design (CSWA), SolidWorks Associate – Additive Manufacturing (CSWA-AM), Entrepreneurship (IIT Roorkee), Principles of Management (IIT Kanpur)

Professional Experience

TATA Power Solar Systems Pvt. Ltd., India **January 2024 – July 2024**
Research and Development Intern

- Deployed and enhanced the 4G data acquisition system for solar panels in solar farms and microgrid commercial regions, ensuring optimized data collection, accuracy, and consistency, resulting in improved functionality OTA
- Improved enclosure design via thermal simulation, boosting heat dissipation by 25% and increasing system stability
- Led inspections and quality control procedures, ensuring product compliance with industry standards like IEC 60950, IEC 61010, ISO 9001, ISO 55001 and ISO 14001 and enhancing overall production quality

OLA Electric Technologies Pvt. Ltd., India **June 2022 – July 2022**
Project Intern

- Analyzed and optimized the General Assembly line for the EV electric scooter (Ola S1 Pro)
- Optimized idle time on the assembly line, and coordinated with different sub-assemblies to improve production quality by 15%. Achieved increased manufacturing efficiency by 15% by re-designing the subassembly structure

ASME Projects Team, VIT India **August 2021 – July 2023**
Mechatronics Head

- Spearheaded a team of 15 people and developed autonomous drones for payload delivery (upto 400g) outdoors
- Developed and manufactured remote controlled electronic propulsion systems for microclass aircrafts/airplanes with fixed/oblique/dihedral wings

Projects

GPS & IMU Sensor Fusion for Automotive Dead Reckoning, NEU **September 2024 – December 2024**

- Built and deployed a custom sensor-fusion **ROS2** package using NEU's NUance autonomous car to execute a full dead-reckoning workflow while integrating GPS and IMU data through an **Extended Kalman Filter** to estimate vehicle trajectory even in GPS-limited environments
- Calibrated magnetometer distortions and fused gyro-mag yaw via a **complementary filter** to estimate heading, while deriving forward velocity and 2D trajectory from IMU data and validating performance against GPS using **Allan variance**

Autonomous Solar Cleaning Bot, VIT India **September 2023 – December 2023**

- Designed a 3D model of an autonomous robot to efficiently perform dry and wet cleaning for solar panels in grid type solar farms, enhancing energy yield by more than 10% in large-scale farms
- Led the development of cleaning algorithms using computer vision and machine learning while overseeing the manufacturing and assembly of core mobility components, enabling autonomous operation with real-time monitoring

Piezoelectric Load-Decoupler, VIT India **May 2023 – August 2023**

- Engineered a piezoelectric-based mechatronic device for autonomous disengagement of couplings for large pipes when axial loads exceed a 50000N, effectively preventing mechanical failures
- Leveraged the piezoelectric material to detect load variations and executed automatic control actions to improve the safety and reliability by 100%

Autonomous Drone, VIT India **September 2022 – February 2023**

- Designed a quad-copter drone featuring path planning and flight control algorithms using Pixhawk for precise autonomous navigation and payload delivery through mapped areas
- Developed effective wireless control systems to enable real-time course optimization and seamless interaction with a central control HUB