Raghav Kumar Agarwal

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Education

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

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 (cash prize of Rs. 10,000) 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++, MATLAB, ROS2, Linux, Git, OpenCV, SLAM, PID, Microsoft Office
Hardware: RasPi 3/4A/4B/Zero, Arduino, CNC Machining Tools, GPS, IMU's, ArduPilot, Pixhawk, IoT Devices
Industrial Applications: MATLAB Simulink, Autodesk Fusion 360, SolidWorks, AutoCAD, 3D Printing
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 the development of autonomous drones for payload delivery of up to 400g with an average battery life of 25 minutes
- Developed and manufactured remote controlled electronic propulsion systems for UAVs (fixed/oblique/dihedral)

Projects

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

- Built and deployed custom Python based ROS2 drivers for real-time sensor data acquisition from GPS and IMU mounted on SPOT (Boston Dynamics) for localization and navigation in indoor environments
- Analyzed IMU's noise characteristics through Allan Variance and calibrated magnetometer by correcting hard and soft iron distortions along with error compensation in IMU and GPS data
- Compensated for accelerometer bias to estimate vehicle's forward velocity, and fused yaw angle computed from gyroscope and magnetometer data to estimate heading for Dead Reckoning with IMU
- Performed sensor fusion by implementing Extended Kalman Filtering (EKF) to get an improved estimate of vehicle's overall trajectory including GPS-lacking environments

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 20% in large-scale farms
- Led the development of cleaning algorithms using OpenCV and communication protocols 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 through unmapped areas
- Developed effective wireless communication systems to enable real-time course optimization and seamless interaction with a central control HUB