

Mukul Yadav

<https://mukulportfolio.com/> | mukuly.2001@gmail.com | +91 80940 21222 | www.linkedin.com/in/my2001

Nationality – Indian | Date of Birth – 16.09.2001

Summary

Mechatronics engineer with two years of experience in automotive product development – skilled in robotics, dynamics, and control. Focused on designing reliable robotic systems through rigorous modeling, hardware integration, and testing. Interested in advancing autonomous robotic systems for sustainable infrastructure and mobility.

Education

Manipal Institute of Technology – Bachelor of Technology (Mechatronics) *June 2019 – July 2023*

- **CGPA:** 8.75/10
- **Batch Rank:** 15/104
- **Minor:** Robotics and Automation
- **Bachelor's Thesis:** Electronics and Embedded Firmware for UAVs

Jayshree Periwal High School, Jaipur *April 2014 – May 2019*

- All India Senior School Certificate Examination (AISSCE 2019): 408/500
- Founder and Maiden President: Aurora Astronomy Club

Sanskar School, Jaipur *April 2011 – April 2014*

Vidyasagar School, Indore *June 2007 – April 2011*

Professional Experience

Robotics Educator, Open Horizon Robotics – Remote *June 2025 – Present*

- Authoring open-source robotics education projects like "Embedded Systems From Source".
- Published simulation studies and producing intuitive guided tutorials about control systems.
- Studying the reliability characteristics of UAV vision using a Jetson Nano and RPi-HQ Camera.

Senior Manager - Product Development, Tata Motors – Pune, India *July 2024 – June 2025*

Graduate Engineer Trainee - Product Development, Tata Motors – Pune, India *July 2023 – July 2024*

- Coordinated cross-functional development activities between design, manufacturing, and testing teams to translate engineering requirements into validated product systems.
- Facilitated the introduction of the Nexon at TPEM's Sanand plant. Troubleshoot beta builds and maintained programme timeline – leading to an increase in monthly production volume by approximately 45%.
- Managed the implementation of the Ethanol-20 fuel pack for the 2025 Tiago/Tigor program; new product introduction led to a spike in monthly platform sales (3000 to 8000 vehicles).
- Collected and analyzed field data from nationwide product surveys to derive quantitative feedback for design and performance optimization.

Research Intern, Artificial Intelligence & Robotics Laboratory, IISc Bangalore *December 2022 – April 2023*

- Designed and implemented STM32-based UAV flight controllers with embedded PID motor control, custom PCB architecture, and ESP32 firmware for real-time signal processing.
- Advanced UAV perception by integrating LiDAR and IMU sensors and developing an Extended Kalman Filter for roll-pitch state estimation, improving orientation stability by nearly 20% during bench tests.
- Investigated embedded systems reliability through experiments on GPS, SD logging, and RTOS; results were documented and maintained in an internal GitHub repository.

Publications

Exploring Generalizable Wireless Embedded System Protocols for Low-Cost Field Robotics *October 2025*

Arvind Kaushik, **Mukul Yadav**, Vikram Sundararaghavan, Neehal Sharrma

- Poster presented at the Southwest Robotics Symposium (SWRS), Arizona State University, USA

Aerodock (A Smart, Autonomous Charging and Docking Station for Unmanned Aerial Vehicles) *March 2022*

Laaboni Mukerjee, **Mukul Yadav**, Amit Choraria, Atharv Tendolkar, Arjun Hariharan, M M Manohara Pai
10.1088/1742-6596/2161/1/012058

Notable Projects

Embedded Systems From Source *June 2025 – Present*

- Writing a structured GitHub-based course on STM32 Discovery, featuring hands-on experiments with interrupts, UART, SPI, I²C, and ADC modules to demonstrate embedded systems concepts.

MAVROS Quadcopter *July 2024 – September 2024*

- Assembled and successfully flown a PX4-based quadcopter with a Raspberry Pi companion computer and MAVROS integration, enabling outdoor GPS-based autonomous flight and telemetry logging.

Omni-Bot (eYRC 2023) *December 2022 – April 2023*

- Designed and programmed a 3-wheel omnidirectional robot featuring inverse kinematics and ArUco-based visual localization; the system's robustness enabled our team to reach the semi-finals of e-Yantra 2023.

Mini Injection Molding Machine *May 2022 – July 2022*

- Developed the mechatronic control system of a 5-ton molding machine, integrating NEMA-34 stepper actuation, PID-based temperature regulation, and PySimpleGUI for an experimental plastic compound.

Technical Skills

- **Robotics & Control:** ROS2, PID/LQR, State-Space Modelling, Sensor Fusion, Kalman Filtering
- **Embedded Systems:** C/C++, Python, STM32/ESP32 Firmware Development, Embedded Linux (Raspberry Pi)
- **Simulation & Design:** SolidWorks, KiCAD, Autodesk Fusion, Simscape

Student Teams and Volunteering

- **IE-Mechatronics:** Peer mentorship; built and demonstrated a 3-DOF arm. *June 2020 – November 2022*
- **NEXAMS:** Manufacturing internship; built mini injection-molding machine. *May 2022 – July 2022*
- **Allskier Solutions:** Designed & built edge-computing solutions. *July 2021 – March 2022*
- **RoboManipal:** Designed power electronics and embedded systems for RoboCon. *February 2020 – October 2021*

Notable Extracurricular Certification

Modern Robotics: Mechanics, Planning, and Control – Coursera (Northwestern University)

- Completed 4 of 6 courses in the specialization as part of team training for RoboManipal (Electronics Division).

Awards and Recognition

- Exceptional Leadership Behavior, **Tata Motors Passenger Vehicles** *February 2024*
- Semi-Finalist, **eYantra Robotics Competition** *April 2023*
- First Prize, **Disenyo PCB Challenge 2k21** *October 2021*
- Winner, **MIT Manipal Ideation Competition** *August 2021*

Languages

English: Proficient (C2/TOEFL 117) | **German:** Beginner (A1) | **Hindi:** Advanced (C1)

Project Portfolio and Awards: <https://mukulportfolio.com/projects>