Mukul Yadav

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Nationality – Indian | Date of Birth – 16.09.2001

Summary

Incoming Master of Science (Robotics) student at National University of Singapore; with a background in Mechatronics, and two years of work experience in automotive product development.

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
- **Undergraduate Project:** 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

Professional Experience

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

- Author and maintainer of the open-source robotics educational project: "Embedded Systems From Source".

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 product development activities between design, manufacturing, and testing teams to enable project delivery within cost, quality and timeline targets.
- Facilitated the introduction of the Nexon at TPEM's Sanand plant. Troubleshot beta builds and helped maintain program 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, I^2C, 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 mini injection molding machine: integrating NEMA-34 stepper actuation, PID-based temperature regulation, and PySimpleGUI for an experimental plastic compound.

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*

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