PRATHAMESH JAYWANT MAWALE

B.E. - Robotics & Automation

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BRIEF SUMMARY

I am an enthusiastic and self-driven engineering student with a deep-rooted passion for robotics and embedded systems. From the very beginning of my academic journey, I've been captivated by the idea of bringing machines to life—combining hardware and software to build systems that can sense, decide, and act. Over the years, this fascination has evolved into hands-on experience through academic projects, club participation, workshops, and even freelancing.

What sets me apart is my clarity in robotics core concepts—from electronics and microcontroller programming to mechanical design and real-time software. I take a holistic approach to learning, ensuring I understand how and why things work at every level—be it low-level motor control logic or high-level autonomy using the Robot Operating System (ROS).

KEY EXPERTISE

ROS | Linux | Shell Scripting | CAD/CAM | Sensor Fusion | Git | Version Control | 3D Printing | OpenCV

EDUCATION

D.Y. Patil College of Engineering, Akurdi — 2021 - 2025

B.E. - Robotics & Automation | CGPA: **8.0** / **10**

Narayana Junior College, Hyderabad — 2021

12th | TSBIE | Percentage: **87.40** / **100**

JSPM's Prodigy Public School, Pune — 2019

10th | CBSE | Percentage: **79.60** / **100**

INTERNSHIPS

BotMakers | Technology — 01 Mar, 2024 - 30 Mar, 2024

Robotics Engineer

Key Skills: Robotics Research | Mechanical Design | Sensor Integration

Completed a 1-month internship at BotMakers Pvt. Ltd. in the Robotics Department, where I focused on the research and development of competition-oriented robots, including Robo Sumo, Robo Soccer, and autonomous challenge bots. My work involved studying mechanical strategies, drivetrain selection, control logic, and sensor-based responsiveness for performance optimization in dynamic and competitive environments. I contributed to design improvements and conceptual strategies for agile movement, stability, and precision control in match scenarios.

This experience enhanced my understanding of real-world robotics competitions and deepened my skills in system integration, design analysis, and robotics innovation under competitive constraints.

PROJECTS

Quadruped Robot — 01 Jun, 2024 - 09 Jun, 2025

Mentor: Dr. N. K. Kamble | **Team Size:** 3

Key Skills: 3D Printing | CAD/CAM | Servo Integration | ROS | Python | C++

Developed a quadruped robot ("Spot Micro"–style) by integrating ROS on a Raspberry Pi 4 to control 12 servos via a PCA9685 PWM driver. Implemented modular ROS nodes in C++ and Python for motion commands (sit, stand, walk), keyboard/joystick interfaces, and optional SLAM using lidar visualization tools like RViz. Built the system in a Docker/Ubuntu environment, configured I^2C for servo control, and validated gaits through finite-state machine logic. This project showcases my proficiency with embedded systems, robotic kinematics, and ROS-based architecture.

Large scale 3D Printer — 01 Aug, 2024 - 30 Sep, 2024

Mentor: Abhinay Mane | **Team Size:** 3

Key Skills: 3D Printing | Raspberry Pi | Linux | Mechanical Design | Stepper Motor Control | Klipper Firmware

Designed and developed a large-format 3D printer with a build volume of 2m x 2m x 2m, capable of printing using PPE plastic pellets through a custom-built extruder system. The Z-axis was stabilized using 4 synchronized ball screws, each driven by NEMA-series stepper motors for precise vertical motion. The machine featured a heated build platform and an enclosed aluminum profile frame with reinforced panels to maintain thermal stability and structural integrity.

The printer's control system used an Octopus V1.1 mainboard paired with Klipper firmware, running on a Raspberry Pi 3B+, enabling remote monitoring and control. The integration of high-performance motion control, modular architecture, and a pellet-based extruder made it suitable for cost-effective large-scale prototyping and industrial applications.

ASTROTIKER line following robot 05 Sep, 2023 - 23 Mar, 2024

Team Size: 4

Key Skills:

FPGA | QUARTUS | 3D Printing | PCB Design | RISC-V Architecture | UART/Bluetooth Communication | Embedded C | Dijkstra's Path Planning | Motor Control | Project-Based Learning

Project Link: https://www.e-yantra.org/

Qualified up to Task 6 in the nationally recognized e-Yantra Robotics Competition conducted by IIT Bombay under the Astro Tinker Bot theme. Developed a grid-navigating autonomous robot using a custom RISC-V processor implemented on an FPGA board. Programmed Dijkstra's algorithm for optimal path planning and integrated UART/Bluetooth modules to manage inter-device communication and motor control.
This project offered practical exposure to embedded system development, low-level hardware-software interfacing, and collaborative problem-solving. Reaching Task 6 demonstrates consistent technical performance, adaptability, and the ability to meet complex robotics challenges under time constraints.

ACHIEVEMENTS

- Completion of E-Yantra competition @ IIT-B
- Qualified for Internations at Robotex National Championship (Line Follower Category)
- Won 2nd Prize at Line Follower competition at Army institute of Technology
- Vice-Captain at DRAIC (Robotics Club)
- Conducted Seminar on ROS at college
- Conducted Introductory Seminar on microcontrollers at college