# Kartikey Pathak

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## EDUCATION

**Veermata Jijabai Technological Institute (VJTI)**                    Mumbai, India
*B.Tech in Electrical Engineering, Minor in Robotics (CGPA 8.01)*                    *2023 – 2027*

**Matoshree Prabodhini Jr. College**                    Maharashtra, India
*HSC, Maharashtra State Board (MHTCET: 99.14%)*                    *2023*

## EXPERIENCE

**Krishna Defence and Allied Industries Limited**                    May,2025 – July 2025
*Research Intern for Defence Technology*                    *IIT Gandhinagar*

- Implemented Simultaneous Localization and Mapping (SLAM) using NAV2 package for autonomous forklift navigation in warehouse environments
- Integrating **Ultra-Wideband (UWB)** technology for **centimeter-level precision** in indoor positioning where GPS is unreliable
- Reduced error to **0.4%** across **10,000 sq meter** operational area.

## PROJECTS

**eYantra Warehouse Drone Competition** | *ROS2, PID, Computer Vision*          October 2024 – January 2025

- Developed advanced PID control algorithms for a drone to achieve stable hovering and precise movement in a simulated warehouse environment
- Implemented computer vision techniques to detect and decode ArUco markers, enabling autonomous localization and navigation

**Kuruma (Quadruped Robot)** | *C, Python*                    January 2025 – March 2025

- Designed and built a four-legged robot capable of traversing various terrains for the Mass Robotics Competition
- Implemented different **gait patterns** (walk, rotate, dance) with adjustable speed parameters for efficient movement

- Developed a teleop controller using **MQTT Protocol** bewteen ESP32 and Raspberry Pi 5, controlled the Quadruped using Joystick

**Voice Video Manipulator** | *ROS2, Gazebo, RViz*                    June 2024 – July 2024

- Programmed forward and inverse kinematics for an Open Manipulator X robot arm to perform precise pick-and-place operations
- Successfully implemented object detection and tracking algorithms to locate target objects in the Gazebo simulation environment

## POSITIONS OF RESPONSIBILITY

**Society of Robotics and Automation (SRA)**                    August 2024 – March 2025
*Active Member*                    *VJTI, Mumbai*

- Conducted technical workshops for students on embedded C programming and ESP32 microcontroller applications
- Mentored junior teams in developing self-balancing and line-following robots, sharing expertise on hardware design and software implementation
- Taught advanced concepts including MPU6050 sensor integration and complementary filter algorithms for accurate orientation estimation

## TECHNICAL SKILLS

**Programming Languages**: C, C++, Python
**Software**: ROS2, Gazebo, RViz, KiCAD, ESP-IDF
**Hardware**: ESP32, Raspberry Pi, Motor Controllers, Sensors
**Specialties**: Robot Kinematics, Embedded Systems, PID Control, Sensor Fusion