Jay Hepat

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Education

VIT Bhopal University **Sept 2022 – present**
B.Tech in Electronics and communication engineering(Al and Cybernetics) Cgpa: 8.14 /10 *Bhopal, Madhya Pradesh*

Technical Skills

Languages: Python, C, Embedded C, Verilog, ROS2
Developer Tools: Arduino IDE, STM32 cubeIDE, Tinkercad, LTspice, Multisim, Linux, MATLAB
Technologies/Frameworks: Embedded Systems, Internet of Things (IoT), AI Applications, VLSI, Robotics

Projects

Autonomous Drone with Obstacle Avoidance | *Python, LiDAR, Pixhawk, PID Control* **Sept 2024 – Apr 2025**

- Designed and developed an intelligent drone system capable of autonomously detecting and avoiding obstacles using LiDAR, ultrasonic sensors, and onboard cameras.
- Implemented the Potential Field algorithm combined with a PID controller to calculate repulsive and attractive forces in real-time, enabling dynamic adjustment of drone trajectory for smooth and collision-free navigation in complex environments.
- Integrated Pixhawk and Raspberry Pi 4 for flight control and processing sensor input, **achieving** 95 % **obstacle detection** accuracy.
- **Reduced navigation errors and operational risk by** 30 %, demonstrating real-world potential for disaster relief and remote deliveries.

Gesture-Controlled Robotic Car | *C/C++, Arduino, NRF24L01, MPU6050* **Sept 2023 – Nov 2023**

- Developed a hand-gesture-based car controlled via an accelerometer (MPU6050), enabling intuitive, contactless directional control.
- Transmitted real-time gesture data using NRF24L01 wireless module to Arduino-based motor controller.
- Achieved 90 % **response accuracy** and **a** 35 % **latency reduction**, enhancing control responsiveness.
- Showcased practical applications in robotics education and assistive mobility for users with limited motor function.

Image-to-Text Recognition System (OCR) | *Python, Tesseract OCR, OpenCV* **Feb 2024 – May 2024**

- Built a low-cost OCR pipeline using Raspberry Pi 3B+ and Pi Camera for converting printed images into editable digital text.
- Applied advanced image preprocessing (thresholding, denoising, contrast adjustment) to enhance OCR accuracy on degraded text.
- Enabled multilingual recognition and modular customization for different formats, with up to 95 % **character recognition accuracy**.
- Streamlined documentation workflows in educational and archival use cases.

Extracurricular

Open-Source Club – Event Management Team **Feb 2024 – Present**
Core Team Member *VIT Bhopal University*

- Collaborated in organizing university-wide technical events with 100+ participants.
- Managed executive board of 5 members and ran weekly meetings to oversee progress in essential parts of the chapter.
- Oversaw logistics, promotions, and team coordination to ensure event success and community engagement.

1st Industrial Conclave 2024 **August 2024**
Team Member *VIT Bhopal University*

- Achieved 12th rank out of 84 teams at the 1st Industrial Conclave 2023, for innovative project presentation and execution.

Certifications

Self-Driving Cars – Coursera:: Studied the core principles of autonomous vehicles including SLAM.
VLSI Design – Maven Silicon: Learned digital design, Verilog, and synthesis concepts relevant to semiconductors.
Generative AI – IBM: Fundamentals of Generative AI including large language models, diffusion models development.