

# ANIRUDH RAGHAVAN

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Graduate student in Autonomy with a strong foundation in Computer Vision, Robotics, and AI-driven perception systems. Experienced in building real-time detection and control pipelines that enhance the reliability and adaptability of autonomous platforms. Driven by a passion for developing intelligent, scalable vision solutions that bridge simulation and real-world performance.

## EDUCATION

**Purdue University, West Lafayette, IN** - MSE in Autonomy (GPA: 3.72 / 4) Aug 2024 – Expected May 2026

- Relevant Coursework:** Vehicular Cyber-Physical Systems, Embedded Systems, Autonomous Systems, Artificial Intelligence

**Vellore Institute of Technology, Chennai, India** - B. Tech- Electronics and Communication Engineering (GPA: 8.11 / 10) 2020 – 2024

- Relevant Coursework:** Robotics and Automation, Machine Learning Fundamentals, Control Systems, IoT Fundamentals

## SKILLS

- Technical Areas:** Computer Vision, Perception, IoT, Embedded Systems, Control Systems, Real-Time Processing, Data Annotation
- Languages & Frameworks:** Python, C++, ROS2, OpenCV, YOLO, TensorFlow, PyTorch, Matlab, Pandas, NumPy, Scikit-learn
- AI/ML Specialties:** Object Detection, Image Classification, Gesture Recognition, Model Fine-Tuning, CNNs, Deep Learning
- Hardware & Tools:** NVIDIA Jetson Nano, STM32, Arduino (UNO/Nano), ESP32/ESP8266, NodeMCU, Gazebo, RViz, Arduino IDE
- Certifications:** Python for Everybody, IBM AI Engineering Specialization, Modern Robotics Course 1: Foundations of Robot Model

## EXPERIENCE

**Student Researcher** — Purdue University, West Lafayette, IN, USA Aug 2025 – Present

- Research project on ROS2 based autonomous driving perception under faculty guidance.
- Currently working with Autoware and AWSIM to design, implement, and test real-time perception pipelines in simulation.

**Internet of Things, Externship (Remote)** — SmartInternz, Hyderabad, India May 2023 – Jul 2023

- Designed and deployed WePark, a smart parking system leveraging ESP32 and IBM Cloud to enable real-time slot tracking and user reservation across mobile platforms.
- Achieved 98% slot detection accuracy, reducing false availability reports by 85% through calibrated sensor integration.
- Implemented cloud-based backend using Firebase and Node-RED, supporting concurrent users with minimal latency. | [GitHub](#)

## PUBLICATION

- Abhishek Sebastian, R. Pragna, K. Vishal Vythianathan, Dasaraju Sohan Sai, U. Shiva Sri Hari Al, **R. Anirudh**, Apurv Choudhary; Design of rubble analyzer probe using ML for earthquake. AIP Conf. Proc. 9 November 2023; 2946 (1): 040003. | [Link](#)

## ACADEMIC PROJECTS

**Exploring Object Detection and Semantic Segmentation on Road Scene Dataset** | [GitHub](#) Jan 2025 – May 2025

- Trained and evaluated YOLOv8 and U-Net on a custom-labelled dataset derived from the Waymo Open Dataset for object detection and semantic segmentation.
- Built a modular benchmarking pipeline for multi-task vision evaluation, supporting easy integration of new models and datasets.

**Weather-Invariant Object Detection: Enhancing YOLOv8 with Environment Adaptive Preprocessing for Robust Performance Across Diverse Conditions** | [GitHub](#) Aug 2024 – Dec 2024

- Developed a modular, scalable pipeline seamlessly integrating weather classification, adaptive image enhancement, and YOLOv8 for robust real-time object detection in adverse weather conditions.
- Achieved 93% mAP across adverse weather datasets using synthetic data and custom augmentations.
- Reduced false negatives by 27% through targeted augmentation and weather-aware preprocessing strategies.

**TurtleBot4 Perception & Object Tracking** | [GitHub](#) Sep 2024 – Oct 2024

- Designed a ROS2-based perception and control system with OpenCV-based object detection in Gazebo.
- Implemented PID-controlled target tracking with real-time feedback and ROS message publishing for closed-loop operation.