

ANIRUDH RAGHAVAN

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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 – Dec 2025

- Designed and executed a unified benchmarking framework comparing YOLOv8 (fine-tuned), YOLOv9, YOLOv12, and Autoware's integrated YOLOX detector on a curated Waymo dataset for person and vehicle detection.
- Built ROS2- and Autoware-based perception pipelines, including dataset preparation, model evaluation tools, and automated quantitative/qualitative analysis for assessing real-world autonomous driving performance.

Internet of Things, Externship (Remote) — SmartInternz, Hyderabad, India | [GitHub](#) 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.

PUBLICATION

1. 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

Structured Slot Aggregation for Cross-Modal Video Object Segmentation | [GitHub](#) Aug 2025 – Nov 2025

- Designed a cross-modal video object segmentation pipeline combining RGB and optical-flow streams with SegFormer backbones, K-Means prototype clustering, slot attention, and a feature aggregation transformer.
- Implemented multi-scale feature processing, prototype-guided fusion, and refinement modules to improve spatial coherence and maintain temporal stability across video frames.
- Validated on the DAVIS-16 benchmark with 85% Mean IoU, 84% Boundary F-measure, and 95% J-Recall, demonstrating strong spatial accuracy and high temporal consistency.

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.
- Achieved 79% IoU on segmentation and 65% mAP on detection, demonstrating strong model performance in complex urban driving scenarios.

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.