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 | 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

- Developed a cross-modal video object segmentation pipeline using SegFormer backbones, K-Means prototype clustering, slot attention, and a feature aggregation transformer.
- Validated on the DAVIS-16 dataset with 85% Mean IoU, 84% Boundary F-measure, and 95% J-Recall, demonstrating strong spatial accuracy and 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.