Prajwal Gurunath

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EDUCATION

Carnegie Mellon University (CMU), School of Computer Science — **Pittsburgh, PA**
Master of Science in Robotic Systems Development (MRSD) — **May 2026**
Coursework: Advanced Computer Vision, Manipulation Estimation and Control, Robot Mobility, Systems Engineering

PES University | GPA: 8.41/10 | Rank: 21/245 — **Bengaluru, India**
Bachelor of Technology in Mechanical Engineering, minors in Computer Science — **May 2021**
Relevant coursework: Machine Learning, Control Engineering, Linear Algebra, Design and Analysis of Algorithms

PROFESSIONAL EXPERIENCE

Indian Institute of Science (IISc) — **Bengaluru, India**
Research Assistant (Computer Vision and Robotics) at AIRL — **Jun 2022 – Jul 2024**

- Led the research direction as first co-author and achieved a +8.06% boost in state-of-the-art (SOTA) single-domain generalization for autonomous vehicle vision, published research in CVPR 2024 (MRFP)
- Developed efficient deep neural networks for real-time inferencing on edge devices in drones and mobile robots
- Built novel infrastructure detection, semantic segmentation and sensor fusion models for remote sensing applications, achieved +4% small building F1 scores over SOTA, published research in CVPR 2023 (DeepMAO)
- Productionized various vision image-processing models on mobile robot "Botsync Copernicus" with Robot Operating System
- Engineered learning-based denoising techniques for Synthetic Aperture Radar imaging
- Mentored 3 interns and 2 new recruits in computer vision and research best practices

Wipro Limited — **Bengaluru, India**
Project Engineer — **Sep 2021 – May 2022**

- Built an automation framework to validate OAuth and certificate-based authentication across 120+ microservices based on API service calls
- Initiated collaboration between SAP and non-SAP, cloud, or on-premise platform teams for enhanced integration

Bosch — **Bengaluru, India**
Industrial Automation Intern — **Mar 2021 – May 2021**

- Incorporated RFID tags tags to monitor material mapping for fuel injection pump assembly value stream and enabled faster response times by reducing 'Time to Resolution Post Defect Identification' by over 50%

PUBLICATIONS

- S Udupa*, **P Gurunath***, A Sikdar*, S Sundaram, "MRFP: Learning Generalizable Semantic Segmentation from Sim-2-Real with Multi-Resolution Feature Perturbation", IEEE/CVF CVPR 2024 [video] [code]
- A Sikdar*, S Udupa*, **P Gurunath***, S Sundaram, "DeepMAO: Deep Multi-scale Aware Overcomplete Network for Building Segmentation in Satellite Imagery", IEEE/CVF CVPR 2023 Perception Beyond Visible Spectrum Workshop [video] [code]
- Manjunath D, **P Gurunath***, S Udupa*, et. al, "IndraEye: Infrared Electro-Optical UAV-based Perception Dataset for Robust Downstream Tasks", under review ICRA 2025

PROJECTS

Autonomous Tote Loco-Manipulation with Unitree G1 Humanoid Robot, CMU| Fall 2024

- Developing vision and reinforcement learning simulation pipelines for generalized loco-manipulation task of tote handling in warehouse environments

Automated Instance Segmentation Annotation Tool, IISc | Spring 2024

- Developed an end-to-end annotation tool for retrieving instance segmentation annotations from Meta Segment Anything Model (SAM) for the VisDrone Object Detection dataset

SLAM with TurtleBot3, IISc | Spring 2023

- Implemented 2D LiDAR SLAM with tele-op and frontier exploration in static indoor environments
- Simulated TurtleBot3 in Gazebo and incorporated RViz for real-time visualization of the LiDAR data, robot pose and the evolving map

Continual Learning with Vision Language Models (VLMs), IISc | 2024

- Conducted research on CLIP-based methods to enhance single-domain knowledge for class and domain-incremental neural network generalization

Team Haya Racing (Formula Student FSAE), PES University | 2019 - 2020

- Led the powertrain subsystem team in designing and 3D printed components such as the intake plenum, engine mounts, heat shield and gear actuators for the Formula Student race car
- Achieved a 15% reduction in component weight resulting in an enhanced power-to-weight ratio of 230 hp/tonne

SKILLS

Programming: Advanced- Python; Intermediate- C++, ROS/ROS2; Basic- Java, MATLAB
Software/Frameworks: PyTorch, TensorRT, Docker, Solidworks, CATIA, ANSYS, Mimics-3-Matic, Blender
Libraries: Scikit-learn, NumPy, Matplotlib, OpenCV
Development Tools: Visual Studio Code, Git
Languages: English (professional proficiency), Hindi, Kannada

ACTIVITIES

Reviewer: IEEE Transactions on Circuits and Systems for Video Technology, SAE AeroCON
Talks: Delivered talks on computer vision at the Faculty Development Program (March 2024), Department of Aerospace Engineering, IISc, Bengaluru. Presented co-first author research at CVPR 2024 and CVPR 2023