Prajwal Gurunath

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EDUCATION

Carnegie Mellon University (CMU), School of Computer Science | GPA: 3.9/4.0 — **Pittsburgh, PA**
Master of Science in Robotic Systems Development (MRSD) — **May 2026**
Coursework: Learning for 3D vision, Advanced Computer Vision, Deep Reinforcement Learning and Control

PES University | GPA: 8.41/10 — **Bengaluru, India**
Bachelor of Technology in Mechanical Engineering, minors in Computer Science — **May 2021**
Honor: First Class with Distinction: Top 7 %

SKILLS

Programming: Advanced- Python; Intermediate- C++, C, MATLAB; Basic- Java, HTML/CSS
Tools/Frameworks: PyTorch, IsaacSim, Mujoco, Docker, Gazebo, ROS 2/1, Git, TensorRT, Realsense, Solidworks, OpenCV, RViz

PROFESSIONAL EXPERIENCE

Nissan Advanced Technology Center (NATC-SV) — **Silicon Valley, USA**
Robotics Intern — **May 2025 – Aug 2025**

- Researched and developed upper-body diffusion policies and VLAs for dense manipulation tasks with the Unitree G1 humanoid robot emphasizing scene generalization and recovery strategies
- Designed and executed sim-to-real robustness tests for whole-body RL policy control in a mock factory environment
- Collected 800 + episodes of visuo-tactile upper-body human tele-op data with stereo RGB/depth for imitation learning
- Established the Humanoid Lab at NATC-SV as a founding member, enabling future robotics research initiatives
- Delivered a live demonstration of the internship outcomes to Nissan's CEO

Indian Institute of Science (IISc), Artificial Intelligence and Robotics Lab (AIRL) — **Bengaluru, India**
Research Assistant (Computer Vision and Robotics) — **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 at CVPR 2024 (MRFP)
- Developed lightweight 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 at CVPR 2023 (DeepMAO)
- Productionized various vision image-processing models on mobile robot "Botsync Copernicus" with Robot Operating System
- Mentored 3 interns and 2 new recruits in computer vision,distributed training, network pruning and research best practices

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

- Developed an automation framework to validate OAuth and certificate-based authentication across 120+ microservices/APIs
- 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**

- Integrated RFID-based material tracking into the fuel injection pump assembly value stream, reducing Time-to-Resolution post defect identification by 50%+, enabling faster response times

PUBLICATIONS

- Y Zhang, Y Yuan, **P Gurunath,** et. al, "FALCON: Learning Force-Adaptive Humanoid Loco-Manipulation", in submission [link]
- 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 (PBVS) Workshop [video] [code]
- Manjunath D, A Sikdar, **P Gurunath**, et.al., "SAGA: Semantic-Aware Gray color Augmentation for Visible-to-Thermal Domain Adaptation across Multi-View Drone and Ground-Based Vision Systems", IEE/CVF CVPR 2025 PBVS Workshop [project page]

PROJECTS

Capstone Project: Humanoid Loco-Manipulation for Tote Logistics, CMU| Spring 2025 [project page]

- Developing deep learning sensor fusion and reinforcement learning (RL) algorithms for generalized humanoid loco-manipulation of objects in warehouse environments
- Deploying foundation models (FastSAM, FoundationPose) on onboard compute Nvidia Jetson Orin X, Intel Realsense D435i and Livox MID 360 Lidar for real-time object pose estimation and localization

Autonomous Shelf Organizer, CMU | Spring 2025 [slides]

- Implemented HSV-based segmentation through ROS on Franka Emika Panda robot with visualization in Rviz
- Employed MoveIt! with RRT-Connect alongside a high level symbolic planner for in-place book sorting and placement

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

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

- Researched CLIP-based continual-learning for single-domain knowledge retention for domain-incremental generalization

ACTIVITIES

Reviewer: IEEE Transactions on Circuits and Systems for Video Technology, SAE AeroCON
Talks: Delivered talks on computer vision at Department of Aerospace Engineering, IISc, Bengaluru. Presented first author research at CVPR 2024 and CVPR 2023