ANEESH CHAVAN

CS PhD student at UVA

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EDUCATION

PhD in Computer Science
University of Virginia (UVA)
Aug 2025 – Present Charlottesville, VA

M.S + B.Tech in Computer Science and Engineering
International Institute of Information Technology, Hyderabad
Sep 2020 – May 2025 Hyderabad, India

EXPERIENCE

CR△L: PhD student, Dept. of Computer Science
Aug 2025 – Present UVA
Robotics | ROS | Safe and agile robotics | Computer Vision | PyTorch

Advisor: Prof. Rohan Chandra

- Joined CR△L, working on **robotic intelligence, safe and agile robotics**.
- Planned research direction in **semantically intelligent robotic systems and planning**.

Robotics Research Center: Undergrad Researcher
Aug 2022 – May 2025 IIIT-H
Robotics | Computer Vision | PyTorch | ROS | C++ | LLMs and VLMs

Advisor: Prof. Madhava Krishna

- Broadly worked on **object-instance reidentification**, indoor **localization** and LiDAR-based **loop detection.**
- Led a project on semantically aware object re-identification and object based localization in cluttered indoor environemnts.
- Worked on loop detection through an **end-to-end model** using compressed embeddings derived from digital elevation maps.
- Experience efficiently **managing a team of 4** junior undergrad researchers and interns on a research project.
- Hands on experience with **designing, training, fine-tuning and evaluating machine learning models** for a variety of robotics and CV tasks.

Bosch Ltd.: Applied computer vision intern
May 2024 – July 2024 Bangalore
Computer Vision | ML | PyTorch | MLOps

- Worked with the **ADAS Viper team** at Bosch Bangalore on **monocular depth estimation**.
- Trained and implemented state-of-the-art ML models from scratch to predict depth estimates from single images.
- Implemented the capability to handle multiple camera models not in the original paper. **This codebase is currently in use**.

Mathworks: Research Intern
May 2023 – July 2023 Hyderabad
Deep Learning | Computer Vision | MatLab

- Headed a project in the **deep learning team** to operationalise and implement state-of-the-art loop detection and closure methods in the **Mathworks DL framework**, writing **custom functions** to preserve differentiability.

IIIT-H: Teaching Assistant
Aug 2022 – Dec 2024 IIIT-H
Operating Systems | Computer Graphics | C/C++ | OpenGL

- TA for the courses **Operating Systems**, **Computer Graphics** and **19th Century Russian Literature**

TECHNICAL SKILLS

- **Languages**: C/C++ | Python | C# | MatLab | Bash
- **Frameworks**: PyTorch | ROS | LLMs and VLMs | OpenGL | LaTeX
- **Misc**: Foundational robotics, RL, multi-agent systems | Mathematical maturity | Technical writing | CMake | MySQL | System admin

PUBLICATIONS

- **A Chavan** et al., "Towards Global Localization using Multi-Modal Object-Instance Re-dentification"
  arxiv preprint, **AIR 2025**, oral acceptance.
- S. S. Harithas*, G. Singh*, **A. Chavan**, et al., "**Findernet**: A data augmentation free canonicalization aided **loop detection and closure technique**..."
  WACV 2024, Early acceptance.

PROJECTS (SELECTED)

Object instance based re-identification and localisation:
Computer Vision | Robotics | Object ReID | VLMs

- Designed a **multi-modal** network that can reliably **re-identify** semantically similar but visually distinct objects in the same category.
- Used a **pipeline of VLMs** to perform zero-shot extraction of relevant objects from images.
- Used this network to design an **object-based localisation framework**, designed to work in cluttered and repetitive indoor scenes.
- Oral presentation at **AIR '25**

FinderNet: CV and robotics
Computer Vision | Robotics | Torch | Loop detection

- Designed a fully differentiable module that **detects loops** by converting 3D LiDAR scans to 2D digital elevation maps and matching them in 2D space.
- Made the pipeline **end-to-end and differentiable** throughout.
- Improved the **system's tolerance to motion in 3D**, **bandwidth efficiency**. The model exhibits **SoTA performance**, tested on public datasets like the KITTI sequences, and on simulators like AirSim.
- Published in **WACV '24**

CoVINS reconstruction for DRDO: Multi-agent SLAM
Computer Vision | Robotics | SLAM | ROS | Loop closure and detection

- Worked on reconstructing pointclouds using LiDAR scans from multiple drones
- Applied the **CoVINS framework** to register pointclouds and optimise pose graphs obtained from multiple drones on in-house and publicly availbale LiDAR datasets.
- Performed reconstruction to a high accuracy in real and simulated, indoor and outdoor sequences.

ACHIEVEMENTS

- **Merit List**: Spring 2023, **Dean's List**: Spring 2022, (IIIT-H)
- **Rank 1** in the UGEE (IIIT-H entrance exam)
- IIIT-H Opensource Developers Club (OSDG) **tech team**