

Akash S Kumbar

DOB: 30 Oct 2001

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EDUCATION

- **IIIT-Hyderabad** Hyderabad, India
MS(Research), Computer Science Engineering; CGPA: 9.2/10.0 2024 – present
- **KLE Technological University** Hubli, India
B.E., Electronics and Communication Engineering; CGPA: 8.42/10.0 2019 – Jul 2023

PUBLICATIONS

* indicates equal contribution.

- **Leveraging 2D Priors and SDF Guidance for Dynamic Urban Scene Rendering** ↗ : Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2025.
Authors: Siddharth Tourani, Jayaram Reddy, **Akash Kumbar**, Satyajit Tourani, Nishant Goyal, Madhava Krishna, N Dinesh Reddy, Muhammad Haris Khan.
We propose a unified framework that integrates Signed Distance Functions with 3D Gaussian Splatting, enabling state-of-the-art dynamic scene reconstruction and rendering without reliance on LiDAR or ground-truth motion annotations.
- **ASUR3D: Arbitrary Scale Upsampling and Refinement of 3D Point Clouds Using Local Occupancy Fields** ↗ : Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, 2023.
Authors: **Akash Kumbar**, Tejas Anvekar, Ramesh Ashok Tabib, Uma Mudenagudi.
A novel framework for arbitrary-scale upsampling of 3D point clouds. Leveraged Local Occupancy Fields to learn continuous implicit representations, enabling the reconstruction of intricate geometric details from sparse, noisy inputs.
- **TP-NoDe: Topology-Aware Progressive Noising and Denoising of Point Clouds Towards Upsampling** ↗ : Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, 2023.
Authors: **Akash Kumbar***, Tejas Anvekar*, Tulasi Amitha Vikrama, Ramesh Ashok Tabib, Uma Mudenagudi.
Proposed TP-NoDe, a topology-aware Progressive Noising and Denoising technique for 3D point cloud upsampling. For topology awareness, we proposed Density Aware k-Nearest Neighbours (DA-kNN).

SKILLS SUMMARY

- **Programming Languages:** Python, C, C++, CUDA, MATLAB, Embedded C
- **Robotics & Navigation:** ROS (Robot Operating System), SLAM, Path Planning (OMPL), Sensor Fusion (LiDAR, RGB-D)
- **Deep Learning:** PyTorch, TensorFlow, LieTorch, Scikit-learn, Transformers
- **Computer Vision:** 3D Geometry, Point Cloud Processing, Gaussian Splatting, 3D Reconstruction/Photogrammetry
- **Embedded Systems:** ARM microcontrollers, 8051
- **Simulations & Graphics:** OpenGL, CARLA, Habitat

EXPERIENCE

- **Robotics Research Center, IIIT-Hyderabad** Hyderabad, India
Graduate Researcher Jul 2023 – present
 - **Dynamic scene reconstruction:** Researching on dynamic scene reconstruction, 3D scene representations, and anomaly detection in LiDAR point clouds.
 - **Publication:** Published a paper in ICCV 2025.
- **Center of Excellence in Visual Intelligence, KLE Technological University** Hubli, India
Research Intern Jan 2023 – May 2023
 - **3D computer vision:** Researched 3D computer vision, representational learning, and refinement of point cloud data.
 - **Publication:** Published a paper in ICCV Workshops 2023.
- **Center of Excellence in Visual Intelligence, KLE Technological University** Hubballi, India
Student Researcher Aug 2021 – May 2023
 - **Point cloud refinement:** Worked on the refinement of 3D point clouds.
 - **Mentorship:** Volunteered as a resource person and mentor to help others explore the point cloud domain.

PROJECTS

- **MAST3R-SLAM** ↗ : Developed a SLAM pipeline from scratch as an experimental framework to evaluate how MAST3R features perform in a SLAM setting. Implemented core components including feature extraction, tracking, and mapping to analyze their effectiveness in reconstruction and localization.
Tech Stack: PyTorch, CUDA
- **ARROU: Adversarially Robust Rank-One Unlearning for LLMs** ↗ : Developed an attacker-in-the-loop framework that combines latent adversarial training with rank-one model editing to reliably remove harmful knowledge from LLMs.
Tech Stack: PyTorch
- **Collision Avoidance in Unknown Environments via Multi-Modal Perception and Reactive planning** ↗ : Developed a real-time navigation framework for the Husky UGV that fuses LiDAR and RGB-D data to autonomously detect and track dynamic obstacles in unknown environments without prior maps. By integrating SLAM-based localization with a reactive planner based on Model Predictive Control, successfully implemented collision avoidance against moving agents during real-world deployments.
Tech Stack: PyTorch, ROS, Gazebo
- **Camera based vehicle functions (Bosch PRIXEL)** ↗ : Designed a computer vision solution to detect potholes and speed breakers on roads, utilizing a custom-engineered dataset that was collected and annotated in-house.
Tech Stack: Python, PyTorch, ONNX, OpenCV
- **Learning based refinement of 3D point clouds through hole filling** ↗ : Developed a deep learning model to identify and repair point cloud gaps caused by occlusion and reflections. Designed an algorithm to generate datasets with realistic holes in point clouds for training and testing.
Tech Stack: Python, PyTorch, PyTorch3D, Open3D
- **Guitar Bot** ↗ : Created a bot using Arduino that can play guitar and built an Android application that lets you select the music.
Tech Stack: Arduino, Embedded C, MIT App Inventor

HONORS AND AWARDS

- Certificate of appreciation in Bosch's PRIXEL Program, Bosch Global Software Technologies — Awarded for developing a robust, real-time computer vision-based speed breaker and pothole detection model.
- Certificate of appreciation for Engineering Exploration course project, Centre for Engineering Education Research, KLE Technological University — Awarded as an outstanding project for making a Guitar Bot using Arduino that plays music through a mobile app. 7th rank out of 150+ projects.

DECLARATION

I hereby declare that the details and information given above are complete and true to the best of my knowledge.

Akash Kumbar