Kumaraditya **Gupta**

RESEARCH COLLABORATOR AT MILA

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Education

Birla Institute of Technology and Science, Pilani (CGPA: 9.54) *Pilani, India*
B.E. IN ELECTRICAL AND ELECTRONICS ENGINEERING *Aug 2019 - July 2023*

Publications

[1] **QueSTMaps: Queryable Semantic Topological Maps for 3D Scene Understanding**
Yash Mehan*, **Kumaraditya Gupta***, Rohit Jayanti*, Anirudh Govil, Sourav Garg, Madhava Krishna
International Conference on Intelligent Robots and Systems (IROS), 2024

[2] **O3D-SIM: Open-Set 3D Semantic Instance Maps for Vision-Language Navigation**
Laksh Nanwani, **Kumaraditya Gupta***, Aditya Mathur*, Swayam Agarwal, A.H. Abdul Hafez, Madhava Krishna
Advanced Robotics, 2024

Achievements

2022	**Awardee**, Mitacs Globalink Research Internship Award	*Victoria, Canada*
2022	**Awardee**, BITS Pilani Merit Scholarship	*Pilani, India*
2020	**Winner**, Formula Bharat Concept Challenge	*Bengaluru, India*

Research Experience

Robotics and Embodied AI Lab, Mila *Remote*
RESEARCH COLLABORATOR | ADVISER: PROF. LIAM PAULL *Sep 2024 – Present*

- Working on the mobile manipulation project to learn scene graph based policies for manipulation and navigation in indoor environments.
- Contributing to the open-vocabulary benchmark proposal to extend the closed-set classes of current 3D scene semantic segmentation datasets.

Robotics Research Center, IIIT-Hyderabad *Hyderabad, India*
RESEARCH ASSISTANT | ADVISER: PROF. MADHAVA KRISHNA *July 2023 – August 2024*

- Contributed to the autonomous wheelchair project, to enable robust vision-language navigation (VLN).
- Created an object instance level 3D map using foundational models, that can be queried using open set natural language commands. We store aggregated CLIP embeddings for each merged object point cloud.
- Developed a pipeline to create queryable semantic topological maps for room-level 3D scene understanding. This work was accepted for IROS 2024 and the OpenSUN workshop at CVPR 2024.

ACIS Lab, University of Victoria *Victoria, Canada*
BACHELOR'S THESIS | ADVISER: PROF. HOMAYOUN NAJJARAN *May-Aug 2022, Jan–Jun 2023*

- Worked on automating data acquisition for photogrammetry in beyond visual line-of-sight applications.
- Developed a graph neural network based model to do next-best-view prediction on an uncrewed aerial vehicle (UAV). The model predicted canonical poses for objects and improved 3D reconstruction quality.
- This work was presented at the conference AeroBest 2023 and was the basis of my bachelor's thesis.

IIRS, Indian Space Research Organisation (ISRO) *Dehradun, India*
RESEARCH INTERN *May – July 2021*

- Worked on land-use mapping and tracking historical patterns in India using deep learning.
- Implemented a semantic segmentation model to identify agricultural land from satellite images.
- The results were presented at ISRO's annual intern conference.

Relevant Skills and Service

- **Tools & Technologies** : PyTorch | ROS | C++ | Eagle PCB | Fusion 360
- **Academic Service** : Reviewer for IEEE Robotics & Automation Letters (RA-L), 2024
- **Teaching** : Instructor for Robotics Summer School 2024, IIIT Hyderabad | TA for Microelectronic Circuits
- **Courses** : Neural Networks and Fuzzy Logic | VLSI Architecture | Operating Systems | Signals and Systems