PYARE LAL

Ph.D. Research Scholar | Data Science and Engineering
Indian Institute of Science Education and Research (IISER) Bhopal, India

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RESEARCH INTERESTS

Urban Perception Modeling · 2D & 3D Computer Vision · LiDAR Point Cloud Processing · Deep Learning for Remote Sensing · Semantic Segmentation · Large Language Models (LLMs) · Urban Computing · Geospatial AI

EDUCATION

Ph.D. in Data Science and Engineering, IISER Bhopal, India *Aug 2022 – Present*
CGPA: 9.0/10 | *Supervisor:* Dr. Vaibhav Kumar, GeoAI4Cities Lab
Thesis: LiDAR Point Cloud Perception for Emergency Vehicle Accessibility Mapping in Urban Environment

M.Tech. in Geoinformatics, Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram *2020 – 2022*
CGPA: 8.69/10 | *Supervisor:* Dr. Ramiya A.M. | *Thesis:* Semantic Segmentation of Point Cloud using Deep Learning

B.Tech. in Civil Engineering, SRM University, Chennai *2012 – 2016*

PUBLICATIONS

** denotes equal contribution* [All paper PDFs]

Impact Factor: Journal Citation Reports 2024 (Clarivate). Quartile (Q): Scopus/SCImago, journal's best subject category.

Peer-Reviewed Journal Articles

[J1] **P. L. Chauhan**, A. S. Bais, and V. Kumar, "Performance Analysis of Subsampled LiDAR Point Clouds Using Deep Learning Based Semantic Segmentation," *Applied Intelligence*, vol. 56, Article 273, 2026. (IF 3.5, Q2) [DOI] [Code]

[J2] V. Kumar, B. Lohani, **P. Lal**, A. S. Bais, and A. Aditya, "Ke-MLS: A Large-Scale Labeled Mobile LiDAR Data Set from Indian Urban Region," *Environment and Planning B: Urban Analytics and City Science*, OnlineFirst, 2026. (IF 3.1, Q1) [DOI]

[J3] **P. L. Chauhan**, T. K. Baswal, and V. Kumar, "A Data-Driven Framework for Pedestrian Oriented Route Planning Leveraging Deep Learning and Spatial Perception," *International Journal of Applied Earth Observation and Geoinformation*, vol. 144, Article 104932, 2025. (IF 8.6, Q1) [DOI] [Code]

[J4] A. Dabra, **P. L. Chauhan**, and V. Kumar, "Deep Learning and Multi Source 2D and 3D Geospatial Data for Urban Quality of Life Assessment," *International Journal of Applied Earth Observation and Geoinformation*, vol. 144, Article 104838, 2025. (IF 8.6, Q1) [DOI]

[J5] A. Nihal*, **P. Lal***, and V. Kumar, "Urban Multi-Domain Mixing (UMDMix) Based Unsupervised Domain Adaptation for LiDAR Semantic Segmentation," *Neurocomputing*, Article 131526, 2025. (IF 6.5, Q1) [DOI] [Code]

Peer-Reviewed Conference Papers

[C1] **P. L. Chauhan**, J. Vijaywargiya, and A. M. Ramiya, "Addressing Class Imbalance Challenge in Semantic Segmentation of ALS Data through Performance Analysis of RandLA-NET and PointNET++," *IEEE India Geoscience and Remote Sensing Symposium (InGARSS)*, Bangalore, India, 2023, pp. 1–4. [DOI]

DATASETS & OPEN-SOURCE CONTRIBUTIONS

- **BhopalMLS**: Lead annotator-training and QC for a large-scale Indian urban mobile LiDAR dataset (data paper under review, ECCV 2026).
- **Ke-MLS**: Co-creator, large-scale labeled mobile LiDAR dataset for Indian urban region. [Paper]

- **svi_perception**: Code for street-view perception and pedestrian-oriented route planning. [GitHub]
- **LiDAR-Subsampling-Benchmark**: Code for subsampling benchmark in LiDAR semantic segmentation. [GitHub]
- **umdmix-uda**: Code for Urban Multi-Domain Mixing (UMDMix) unsupervised domain adaptation in LiDAR semantic segmentation. [GitHub]

RESEARCH EXPERIENCE

Doctoral Researcher, GeoAI4Cities Lab, IISER Bhopal *Aug 2022 – Present*

- Deep learning for LiDAR semantic segmentation in urban environments; emergency vehicle accessibility mapping using 3D geospatial data
- Cross-city perception modeling (Mumbai–Paris) and multi-source 2D/3D fusion for urban quality-of-life with a Global-South corrective framing
- Lead annotator-training and QC for **BhopalMLS**, a large-scale Indian urban mobile LiDAR dataset (data paper under review, ECCV 2026); unsupervised domain adaptation for cross-domain segmentation

M.Tech. Research, IIST Thiruvananthapuram *2020 – 2022*

- Semantic segmentation of airborne LiDAR with deep learning (RandLA-Net, PointNet++); addressed class-imbalance in ALS classification

PROFESSIONAL EXPERIENCE

Data Science Intern, GalaxEye Pvt Ltd (IIT Madras startup), Chennai *Feb – May 2022*

- Road network detection and pre-fire risk prediction using Sentinel-1 (SAR) and Sentinel-2 (optical) imagery; vegetation cover change pipelines in Python

Research Intern, Indian Institute of Soil & Water Conservation (IISWC), Dehradun *Jun – Aug 2022*

- Land use / land cover classification and change detection on Sentinel-2 and Landsat imagery; NDVI/EVI time-series workflows on Google Earth Engine

HONORS & AWARDS

- **First Prize**, IEEE-GRSS Student Hackathon 2023
- **Top 5 Winner**, DST-SOI-Microsoft Geospatial Research Hackathon, IIIT Hyderabad 2023
- **ACM India Anveshan Setu Fellowship** 2023
- **Travel Grant**, IndoML Symposium, IIT Gandhinagar 2022

TEACHING EXPERIENCE

Teaching Assistant, IISER Bhopal: Artificial Intelligence (DSE313) [GitHub], Spatial Data Science (DSE416), Accelerated Applied AI, Applied Optimization.

TECHNICAL SKILLS

Programming:	Python, MATLAB
Deep Learning:	PyTorch, TensorFlow, Point Cloud Networks
Geospatial:	Google Earth Engine, QGIS, ArcGIS, CloudCompare, Open3D
Remote Sensing:	Sentinel-2, Landsat, Sentinel-1 SAR, LiDAR (ALS/MLS) Processing
Tools:	Git, Docker, LaTeX, Linux
Languages:	Hindi (native), English (professional)