



Dr. Rohit Yadav

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ABOUT ME

Dynamic Research Engineer specializing in **Robotics, Computer Vision, and SLAM** with a strong passion for **autonomous vehicle perception, visual place recognition, and AI-driven localization**. Adept at research, industry collaborations, and publishing high-impact work.

WORK EXPERIENCE

PRINCIPLE RESEARCH ENGINEER – DEEPTERRAIN AI – 01/12/2025 – Current – BANGALORE, INDIA

- **Perception Lead – Autonomous Surveillance (company flagship product, ongoing):** Architecting detection and semantic segmentation pipelines and designing LiDAR–camera fusion (temporal sync, extrinsic calibration) to enhance robustness in unstructured off-road environments. Overseeing the perception stack for the company's core autonomous surveillance system, ensuring production-grade reliability and performance.
- **Led a client-facing PoC for adaptive multi-sensor ADAS:** Managed a team to develop algorithms for MOIS, BSIS, AEBS, and LDWS, and designed a Finite State Machine (FSM) to dynamically manage sensor and warning activation based on vehicle speed and driving conditions in compliance with ASI guidelines. Integrated five monocular camera feeds and dual radar sensors on an NVIDIA Jetson AGX Orin and implemented the system on a Tata T9 truck, delivering energy-efficient, ASI-compliant ADAS performance and successfully validating the PoC on the ZF test track.

SENIOR RESEARCH ENGINEER – NAVAJNA TECHNOLOGIES PVT. LTD. – 15/05/2024 – 30/11/2025 – HYDERABAD, INDIA

- Led the MBRDI in-cab Driver & Passenger Monitoring (DMS) project: owned end-to-end multi-ethnicity data procurement, QA and privacy/compliance; defined capture protocols and partnered with algorithm teams to reproduce and close corner cases across Eye Motion Tracking (EMT), head-pose and Eye gaze modules.
- Led international field operations in Oman, Prague, and Germany, personally overseeing instrumentation, calibration, and standardized capture workflows. Delivered high-fidelity datasets across diverse lighting and cultural contexts, enabling robust and generalizable AI model performance.

PRIME MINISTER RESEARCH FELLOW(PMRF) – IIIT ALLAHABAD - NAVAJNA TECHNOLOGIES - SERB (FICCI)

– 10/08/2019 – 14/05/2024 – PRAYAGRAJ, INDIA

- Awarded the Prime Minister's Research Fellowship (PMRF), a prestigious doctoral fellowship in India that supported my PhD research with funding, mentorship, and industry exposure.
- Researched localization techniques for autonomous vehicles and mobile robots operating in challenging lighting conditions.
- Developed multiple algorithms incorporating heuristics such as the fusion of visual odometry, visual place recognition, and semantic information.
- My research thesis explores the implementation of visual SLAM on a self-collected dataset from the IIITA campus under adverse lighting conditions, incorporating cutting-edge visual place recognition methods to improve localization and mapping performance.

JUNIOR RESEARCH FELLOW – NAVAJNA TECHNOLOGIES – 01/08/2018 – 10/07/2019 – PRAYAGRAJ, INDIA

- Served as a Junior Research Fellow in a collaborative project involving Navajna Technologies, IIIT Allahabad, and MBRDI (Mercedes-Benz Research & Development, India)
- My role involved implementing and analyzing the performance of SLAM and visual odometry techniques on datasets provided by MBRDI.
- Evaluated the performance of various SLAM techniques by implementing state-of-the-art SLAM algorithms

EDUCATION AND TRAINING

01/08/2019 – 14/05/2024 Prayagraj, India

PHD(ROBOTICS) Center of intelligent Robotics lab, Indian Institute of Information Technology, Allahabad

10/08/2016 – 01/06/2018 Prayagraj, India

M.TECH.(INTELLIGENT SYSTEMS) Robotics and Machine Intelligence Lab, Indian Institute of Information Technology, Allahabad

01/08/2011 – 01/07/2015 Ferozepur, India

B. TECH. (CSE) SBSSTC, ferozepur, Punjab

PROJECTS

Ph.D Thesis: Sequential visual place recognition for SLAM in adverse lightning conditions

- Developed **localization algorithms** for adverse lightning conditions.
- Proposed **cross-domain visual place recognition** with semantic feature integration.
- Applied **GANs** for de-raining perception tasks.

M.Tech. Project: Transfer Learning in Lifestyle Disease Detection

- Developed **deep neural networks** for ECG-based classification of **atrial fibrillation and sleep apnea**.
- Applied **transfer learning techniques** to improve classification accuracy.

M.Tech. Project: Domain Adaptation in 3D Object Recognition

- Implemented **Geodesic Flow Kernel** and **Subspace Alignment** for **domain adaptation in 3D object recognition**.

PUBLICATIONS

Fusion of visual odometry and place recognition for SLAM in extreme conditions.

Yadav, R., Kala, R. Fusion of visual odometry and place recognition for SLAM in extreme conditions. Appl Intell 52, 11928–11947 (2022). <https://doi.org/10.1007/s10489-021-03050-6>

Locality-constrained continuous place recognition for SLAM in extreme conditions

Yadav, R., Pani, V., Mishra, A. et al. Locality-constrained continuous place recognition for SLAM in extreme conditions. Appl Intell 53, 17593–17609 (2023). <https://doi.org/10.1007/s10489-022-04415-1>

Sequential visual place recognition using semantically-enhanced features

Paturkar, V., Yadav, R. & Kala, R. Sequential visual place recognition using semantically-enhanced features. Multimed Tools Appl 83, 50477–50491 (2024). <https://doi.org/10.1007/s11042-023-17404-4>

RGB and Thermal Image based Human Intrusion Detection in Off-Road Scenarios: A New Dataset and Benchmark

Accepted in 2025 IEEE *International Conference on Industrial and Information Systems (ICIIS)*, Peradeniya, Sri Lanka

Migratory Particle Filter Ensemble for Sequential Visual Place Recognition

Submitted at IEEE Transactions on Intelligent Vehicles (*Under Review*)

A Finite State Machine Based Adaptive Multi-Sensor Selection Architecture for Real-Time Advanced Driver Assistance System for Indian Road Conditions

Submitted at IEEE Sensors Journal (*Under Review*)

HONOURS AND AWARDS

Prime Minister Research Fellowship (PMRF) (2020-2024) – Science and Engineering Research Board(SERB)

GATE Scholarship (2016-2018) | AIR 3612 (GATE-2016) – Ministry of Human Resource Development

Student Gymkhana Speaker, IIIT Allahabad (2022) – IIIT Allahabad

Badminton Tournament Medals (Inter & Intra-College)

● **PROFESSIONAL SKILLS**

Language, Tools and Libraries

Programming: Python (Strong), C/C++, CUDA, Bash, ROS
AI & Machine Learning: Deep Learning, Computer Vision, Robotics Vision
Libraries & Frameworks: PyTorch, TensorFlow, OpenCV, Scikit-learn, PCL
DevOps & Tools: Docker, GitHub, Linux, HPC Clusters
Hardware Expertise: Stereo Cameras, Radar, LiDAR, GNSS, IMU, GPUs, Nvidia Jetson