Tejaswini Dilip Deore

+1 857-313-5903 • deore.t@northeastern.edu • LinkedIn • GitHub • Portfolio

EDUCATION

Master of Science in Robotics, Computer Science Concentration Dec 2024
Northeastern University, Boston, MA **GPA**: 4.0/4.0
Courses: Robotic Sensing and Navigation, Computer Vision, Reinforcement Learning, Artificial Intelligence

Bachelor of Technology in Electronics and Telecommunication, CCOEW, Pune, India, **GPA:** 8.89/10 Nov 2020

PROJECTS

Open Vocabulary 3D Scene Understanding Dec 2024

- Developed a pipeline for **open-vocabulary 3D scene graph construction**, enabling **multi-modal queries**
- Integrated vision foundation models (RAM, Grounding DINO, SAM, CLIP) to **extract and encode semantic features** from 2D images onto 3D point clouds
- Constructed hierarchical **scene graphs** capturing object-room relationships, **enhancing natural language object retrieval accuracy by 95%** on the Replica dataset

Monocular Visual Odometry System [code] Aug 2024

- Designed a **feature-based visual odometry pipeline** for vehicle trajectory estimation using the **KITTI dataset**, incorporating **Shi-Tomasi feature detection** and **Lucas-Kanade tracking**
- Integrated **GPS scale correction**, refining trajectory estimation for real-world applicability
- Containerized the system with **Docker** for reproducible deployment and visualization

Image Caption Generator [code] Apr 2024

- Built an image captioning system using **CNN-LSTM and ViT-GPT2** models to generate descriptive text from images
- Trained and evaluated models on Flickr8k dataset with BLEU, ROUGE, METEOR, and CIDEr metrics

Comparative Analysis of Optical Flow Estimation and Facial Motion Tracking [code] Apr 2023

- Evaluated Farneback Algorithm vs. FlowNet 2.0 for **dense optical flow estimation**, benchmarking performance on L1 error, endpoint error, and angular error
- Developed a **facial motion tracking system** combining optical flow with Haar-Cascade classifiers, and conducted a **quantitative overlap analysis**, comparing predicted facial motion across different methods

3D Object Classification from Partial Point Cloud [code] Apr 2023

- Engineered **GRNet-PointNet architecture**, enabling high-accuracy object classification from partial point cloud data
- Achieved **93.8% accuracy**, surpassing PointNet++'s **70% baseline performance**

Robust Sensor Fusion System for State Estimation in Complex Environments [code] Dec 2022

- Evaluated Visual-Inertial Navigation System's performance across diverse environments using ORB-SLAM3
- Integrated an RTK-GPS system with NTRIP Client, **enhancing global positioning accuracy**
- Implemented a **sensor fusion algorithm (GVINS)** fusing GNSS, visual, and inertial data for precise state estimation

WORK EXPERIENCE

Graduate Teaching Assistant Jan 2024 - Apr 2024
Northeastern University, Boston, MA

- Mentored **120+ students**, guiding **C++, Python, and OpenCV-based projects** for the **Pattern Recognition and Computer Vision** course
- Conducted **code reviews**, offering actionable feedback to enhance algorithm efficiency and implementation accuracy

Mechatronics Engineering Co-op Jul 2023 - Dec 2023
Festo Corporation, Marlborough, MA

- Designed **IEC 61010-1 compliant** safety circuitry for a high-voltage liquid handling system, ensuring operational safety
- Engineered a **control cabinet for a 3-axis gantry system**, working closely with PLC and safety controller, developing electrical schematics, and programming safety features
- Conducted **comparative analysis** of piston pumps by utilizing a data acquisition system to evaluate performance

European Train Control System Application Engineer Oct 2020 - Jun 2022
Alstom, Bangalore, India

- Led data curation for Radio Block Centre, ensuring **on-time delivery of critical train control data**
- Analyzed and optimized technical documents and design tools, enabling **streamlined decision-making**
- Conducted **training sessions** for **20+ engineers**, enhancing team proficiency in ETCS data design tools and processes

TECHNICAL SKILLS

Programming: C++, Python
Robotics & Perception: ROS, OpenCV, PyTorch, PCL, NumPy, Matplotlib, SLAM, VO
Tools: Git, Ubuntu, Docker, LTSpice, EPLAN P8