

BHUVAN JHAMB

Seeking Full-time roles starting December 2024 in the domain of Computer Vision/Perception/Robotics
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Education

Carnegie Mellon University

Aug 2023 – Dec 2024

M.S. in Computer Vision @ Robotics Institute, School of Computer Science

CGPA: 4.11/4.0

Selected Courses: Learning for 3D Vision, Robot Learning, Machine Learning, Advanced Computer Vision

National Institute of Technology, Allahabad

Jul 2017 – May 2021

Bachelor of Technology

CGPA: 8.69/10.0

Achievements: President-Robotics Club, Merit Scholarship Recipient

Technical Skills

Languages: C, C++, Python, MATLAB/Octave

Libraries: PyTorch, PyTorch3D, Numpy, OpenCV, Pybind11, PCL, GTest, Git, ROS, Eigen, g2o, Doxygen, CMake, Ceres

Competencies: Computer Vision, Deep Learning, 3D Vision(SLAM, NeRF, Gaussian Splat, etc.), Robotics

Experience

Computer Vision/Robotics Intern - Tesla

May 2024 - Aug 2024

- Worked on different aspects of **autonomous navigation** for **Optimus** (Tesla's humanoid robot)
- [Non Disclosure Agreement] Developed and deployed algorithms for **autonomous docking**, **online camera calibration**, **pose estimation**, and **multimodal navigation**

Robotics Software Developer - Intel Corporation

May 2021 – August 2023

AI and Computer Vision @ Vision Technologies Group (Intel Realsense)

- Engineered **unsafe region detection** for functional safety of autonomous mobile robots using stereo-depth cameras
- Developed robust, **interpretable** and **ISO-26262** compliant **lightweight** algorithm, capable of being run on safety certified hardware. Achieved **0.2% false negative rate** while maintaining **2% false positive rate**
- Generated **segmented pointcloud** and **occupancy grid** to support downstream tasks. Also, **designed metrics** to **quantify uncertainty** of results. Followed **MISRA-C standards** for software development ([certification](#))
- Implemented **comprehensive test suite**, cross-platform **logger**, Python & ROS **wrappers**, and managed **releases**

Silicon and Systems Prototyping Group @Intel Labs

- Worked on **Visual Inertial SLAM** for Digital Twin and Scene Intelligence platforms ([link](#))
- Developed modules to **integrate inertial data and visual slam**, implement **robust backend optimization** via **pose graph optimization** and **bundle adjustment**, preprocess depth images, and **point cloud registration** using ICP
- Optimized code using compute profiling to **achieve performance of 60+ FPS**, benchmarked results, ensured **IP compliance** through **protexIP** scans, and managed tech transfer. Initially, I was getting payroll from Anlage Infotech

Summer Research Fellow-Indian Academy of Science

May 2020–August 2020

Guided by Dr. Deepak Mishra (Associate Prof, IIST Trivandrum) and Mr. Sandip Paul (Scientist G, ISRO)

- Implemented novel loss function for **monocular depth estimation** incorporating Huber loss and gradient information
- **Achieved improved depth map accuracy in NYU-v2 dataset**, especially in regions with high blur ([journal paper](#))

Robotics and Computer Vision Intern - TATA Advanced Systems Limited

May 2020-July 2020

- Developed a **navigation system** for UAVs in **GPS Denied indoor environments** to explore unknown areas
- Used particle filter slam for **mapping**, AMCL for **localization**, A* for **global planning**, and DWA for **local planning**

Projects

Dense SLAM in the Wild | MSCV Capstone Project (Ongoing)

- Engineering **dense SLAM** systems that work **in the wild**, with challenging data like **motion blur** and **sparse views**
- Exploring coupling **3D Gaussian** backend with robust **foundation models** feature frontend

Development of a Stage 3 Autonomous Vehicle Research Platform | Senior Year Project ([link](#))

- Developed autonomy stack for 1/10th scale RC vehicle research platform. Implemented autonomous GPS waypoints traversal, drivable region estimation, planner (A*, DWA), and controls(PID)
- Used CARLA and Webots prior to hardware implementation. Achieved **best paper award** at ICRCV-22 conference

Automation of Quadcopter Flight in Indoor Environment using ROS | eYantra Robotics competition ([link](#))

- **Automated the flight of a drone in an indoor environment** to mimic bee pollination. Implemented **precise localization** of drone and other environment elements through **whycon** markers and a roof-mounted monocular camera

Publications

1. S. Paul, **B. Jhamb**, D. Mishra, M. Senthil Kr., "Edge loss functions for deep-learning depth-map" ([link](#))
2. **B. Jhamb**, A. Gupta, M. Karim, "3D obstacle avoidance and path planning for quadrotor using modified DWA" ([link](#))