

BHUVAN JHAMB

Seeking Internships for Summer-2024 in realm of Computer Vision/Perception/Robotics/Embodied-AI

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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

Courses: Machine Learning, Advanced Computer Vision, Math Fundamentals for Robotics

National Institute of Technology, Allahabad

Jul 2017 – May 2021

Bachelor of Technology in Mechanical Engineering

CGPA: 8.69/10.0

Achievements: President-Robotics Club, Merit Scholarship Recipient

Technical Skills

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

Software/Frameworks: ROS, ROS-2, PyBullet, OpenCV, PyTorch, Pybind11, CARLA, Webots, GTest, Git, g2o, VTune

Hardware: Hands on Experience with Sensors, RGB-D Sensors, Pixhawk (Flight Controller), Actuators, 3D Printing

Competencies: Computer Vision, Machine Learning, Deep Learning, SLAM, Sensor Fusion, Functional Safety, Robotics

Experience

Intel Corporation-Robotics Software Developer

May 2021 – August 2023

AI and Computer Vision @ Vision Technologies Group

- Engineered functional safety technology for autonomous mobile robots using Intel Realsense (stereo-depth cameras)
- Developed robust, interpretable and **ISO-26262 compliant lightweight unsafe region detector** capable of being run on safety certified hardware. Achieved **0.2% false negative rate** while maintaining **2% false positive rate**
- Built software stack for same using **MISRA-C standards**, implemented comprehensive test suite, built Python and ROS wrappers, and handled multiple releases

Silicon and Systems Prototyping Group @Intel Labs

- Worked on **VI-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-based slam for mapping, AMCL for localization, A* for global planning, and DWA for local planning

Projects

Development of a Stage 3 Autonomous Vehicle Research Platform | *Senior Year Project*

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

Autonomous Carrier Drone | *Cisco thingQbator MNNIT (paper)*

- Developed a **GPS-guided autonomous drone** to deliver products in the university and perform flight maneuvers
- Engineered a novel 3D obstacle avoidance using RGB-D camera by discretizing the space into cells, and evaluating a cost function for each grid cell based on depth image and dynamics

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 the pollination process of a honeybee
- Implemented precise localization** of drone and other elements in the environment through Whycon markers and a roof-mounted monocular camera. **Implemented and fine-tuned PID controller** for drone

Minor Projects

- Implemented **homography estimation**, used it to project a reference image into different scene and to stitch panoramas
- Implemented basic **sparse structure from motion and multi view stereo** pipeline from scratch
- Implemented calibrated and uncalibrated versions of **photometric stereo**