Abhinav Reddy Kowkuntla

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Availability – January 2025 to August 2025

**EDUCATION**

**Northeastern University, Boston, MA**  Dec 2025

Master of Science in Robotics, Concentration: Electrical and Computer Engineering

**Coursework**: Robotics Sensing and Navigation, Robot Mechanics and Control, Autonomous Field Robotics, Computer Vision

**Amrita Vishwa Vidyapeetham, India** Jun 2020

Bachelor of Technology in Electronics and Communications Engineering

**Coursework**: Computer System Architecture, Linear Algebra, VLSI Design, Signal Processing, Human Centered Design

**Leadership**: Secretary of Student Club, Executive Officer in Toastmasters College Club

**TECHNICAL SKILLS**

**Software:** MATLAB Simulink, SolidWorks, ROS, AUTOSAR, Gazebo, GitHub, Jenkins, Azure, CICD, CANoe, CANape.

**Computer Vision:** Projective Geometry, 2D Homography, Image Semantics, Segmentation, Classification, Factor Graphs, Low contrast imaging, 3D reconstruction, Multi-View Geometry, Bundle Adjustment, Perspective-n-point

**Robotics:** Dead-Reckoning, Factor Graph, GTSAM, SLAM, ROS data logging (Bag files), Sensor Fusion.

**Hardware Skills:** Arduino, Raspberry Pi.

**Programming and OS:** Python, C, C++, Windows, Linux, Data Structures and Algorithms, Convolutional Neural Networks.

**Libraries:** Numpy, Pandas, Scipy, Scikit-learn, Pytorch.

**Machine Learning:** KNNs, Decision Trees, Support Vector Machines.

**WORK EXPERIENCE**

**Function Owner/** **Lead System Developer, Robert Bosch, India** Jan 2021 – Nov 2023

* Performed Model Based Development using Simulink for Application Software of Driver Assistance Systems (ADAS) in Four-Wheeler Automatic Parking Systems.
* Developed Base Software using C and C++ for Failure Management and Communication modules based on AUTOSAR architecture.
* Supervised and handled GitHub and Jenkins as project administrator for the team consisting of 20 associates.
* Deployed Code into ECUs (Embedded Systems) using WinIdea Environment for developer code performance testing.
* Administered Software Development Life Cycle for analyzing of requirements, design, development and testing.
* Negotiated project requirements and design with customers based out of Asia Pacific regions and project stakeholders based out of Europe.
* Awarded as “Out of the Box Thinker” and “Lead by Example” among a team consisting of 20 associates.

**PROJECTS**

**Large-Scale Underwater Images Mosaicing** Fall 2024

* Calculated Homography and performed optimization using GTSAM factor graph techniques for creating a mosaic containing 200 underwater images.
* Extracted features and performed loop closures on overlapping images using factor graph for accurate image placement.
* Referenced and utilized the same dataset used in [“O. Pizarro and H. Singh, "Toward large-area mosaicing for underwater scientific applications".](https://ieeexplore.ieee.org/document/1255512)

**Multi-view 3D Reconstruction using Bundle Adjustment** Fall 2024

* Performed point cloud reconstruction on a set of 24 2D images using GTSAM.
* Computed and optimized the final camera poses for 3D reconstruction using bundle adjustment through GTSAM.

**Comparative Analysis of LiDAR Based Mapping** Spring 2024

* Comprehensive analysis of LEGO-LOAM and LIO-SAM SLAM algorithms had been conducted to evaluate their performances.
* Performance Evaluation had been performed in terms of accuracy of reconstructed path and computational efficiency when tested on similar datasets.
* Conducted initial testing on manually simulated dataset on Gazebo on square, circular paths, followed by testing on KITTI outdoor dataset.

**ORB-SLAM3 on Boston Dynamics SPOT , Northeastern University, Boston, MA** Nov 2024 - Present

* Understand and use the API of SPOT system to implement ORB-SLAM3 for achieving Multi-Map generation, a specialty of ORB-SLAM3