Thippeswamy K.S.

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Summary

Computer Vision and Robotics Engineer building deep learning perception systems for autonomous mobile robots and ADAS: object detection, segmentation, tracking, and 3D scene understanding across multi-modal sensor data (LiDAR, camera, IMU). Experience building data processing pipelines, evaluation frameworks, and ML deployment workflows across the full lifecycle, plus labeling strategies/tooling and dataset management, augmentation and versioning for model training. Strong in PyTorch, ROS 2, C++, Python, OpenCV, and 3D geometry/sensor fusion (LiDAR–camera calibration). IEEE DISCOVER 2026 paper on vision-based odometry.

Education

GITAM Deemed to be University, Bengaluru, B.Tech ECE (CGPA 8.55/10) 2022 – 2026
Sri Chaitanya PU College, Ballari, Pre-University, 70% 2019 – 2021

Experience

Junior Robotics Engineer | Virya Autonomous Technologies Sep 2025 – Present

- Co-built the SLAM and localization stack for autonomous mobile robots (AMRs), selecting the architecture and multi-sensor fusion (LiDAR, camera, IMU) for reliable indoor and outdoor localization across real-world deployment conditions.
- Designed and implemented the Supervisor node, a ROS 2 control layer for launching, logging, safety, crash handling and systems integration in real-time systems: it starts nodes on any machine on the network to distribute compute load, detects crashes, stops affected processes and clears zombie nodes.

Computer Vision & Robotics Intern | MURTI (SDV), GITAM 2024 – 2025

- Ran proof-of-concept experiments evaluating visual odometry and SLAM methods, including deep-learning-based models, to track a vehicle's motion without GPS and with or without LiDAR.
- Built a drivable-region detector for Indian roads that finds the road and free space ahead so an autonomous vehicle knows where it can travel.

Projects

InfraTrackADAS: Road Auditing | Detection, Tracking, Map Matching, Odometry

- Developing a system that turns dashcam or phone footage into a road audit report for authorities, comparing what should exist on a road (OpenStreetMap, traffic rules) with what the camera sees to flag missing, wrong or phantom signs, road damage, unsafe driving and posters, and sending corrections to OpenStreetMap.
- Built the perception engine to run offline on a single consumer GPU with a monocular camera and phone GPS (no LiDAR or RTK), covering detection, segmentation, tracking, monocular depth, visual odometry and map matching, validated on the KITTI benchmark.

AutoSegmentor: Video-to-Dataset Auto-Labeling | SAM2, CoTracker3

- Built labeling strategies and tooling for automated annotation and dataset management, with QA workflows for training models that detect pallets and trolleys and give their 6-DoF pose from keypoints: clicks on one frame propagate masks and keypoints across the video and export versioning-tracked detection, segmentation and pose datasets, so new AMRs can be brought up for pallet pickup, docking and trolley handling without manual labeling.
- Generated semi-synthetic, augmented data from real footage using exact masks, so models train robustly from minimal data.

Calibrate-Suite: LiDAR–Camera Calibration Toolkit | AprilTag, Open3D, PyQt5

- Built a 3D geometry and sensor-fusion toolkit that finds the exact position and orientation between a robot's LiDAR and camera so their data can be fused correctly, using an AprilTag board, corner matching, outlier rejection and quality filtering over 20+ poses, with reprojection and rotational error reporting.
- Added LiDAR-to-LiDAR registration (ICP, GICP) to check sensor mounting and drift, and packaged everything as a PyQt5 app with ROS 2 bag recording, visualization and CLI tools, plus a demo fleet server for results from multiple robots.

Lane Mapping Tool: Route Network Builder | Python, ROS

- Built a tool to draw and refine the road network an autonomous vehicle follows, with smooth paths and connected junctions, exported as a graph for path planning.

Publication

Vision-Based Odometry: Comparative Analysis on Standard and Custom Datasets for Resource-Limited Vehicle Platforms, *2026 IEEE DISCOVER, Puttur*

Skills

Core: Computer Vision, SLAM & Localization, Visual Odometry, Object Detection & Tracking, 3D Scene Understanding, Pose Estimation, Dataset Engineering & Automated Annotation
Frameworks: ROS 2, PyTorch, TensorRT, OpenCV, YOLO, SAM2, CoTracker3, RTAB-Map, DLIO, GICP, GTSAM, CUDA
Languages & Tools: Python, C++, Git, Linux **Sensors:** LiDAR, RealSense, Stereo, IMU