Robotics Software Engineer | Computer Vision, Autonomous Navigation, Sensor Fusion
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I am Sourabh Tiwari, a Robotics Software Engineer with experience in designing, developing, and deploying intelligent robotic systems. Specializing in ROS2, Autonomous Vehicles & Drones. I thrive on solving complex challenges through innovative engineering and advanced technologies.

EDUCATION

2023-2024 Post Graduation Diploma in Data science, AI, and Robotics | IIT Jodhpur, India
2017-2021 Bachelors of Technology in Electrical and Electronics Engineering | GGSIPU Delhi, India

EXPERIENCE

Present
December 2024

Robotics Software Engineer | Peykbot, United Arab Emirates

- Development of **computer vision solutions** for **autonomous navigation** in dynamic environment for both outdoor and indoors.
- Integration of **traffic sign detection** with distance estimation using synchronized RGB and depth data (Intel RealSense).
- Implementation of autonomous **docking station parking** strategies based on visual perception.
- Developed a **centimeter-accurate localization system** by integrating RTK-GPS, IMU, and LiDAR odometry using **Unscented Kalman Filter (UKF)** in ROS 2.
- Deployed on a mobile robot with integration of **depth sensing, semantic segmentation, and obstacle-aware cost maps**, forming a complete perception-to-navigation pipeline.

November 2024
June 2023

Robotics Software Engineer | Control One. Ai, Bengaluru, Karnataka

- Autonomous Vehicle Development: Led the design and development of control systems for **autonomous and semi-autonomous vehicles, including forklifts and mobile robots (BOPT),** with ROS2-based navigation and sensor fusion.
- **Reactive Navigation & Image Processing:** Developed reactive navigation systems using 1280p image processing, **2D/3D object detection, and RTAB-Map SLAM** for 3D environmental mapping and obstacle avoidance.
- **Sensor Fusion & Integration**: Integrated and fused data from various sensors, including TOF sensors, Lidar, and encoders, to optimize vehicle performance and ensure safe and reliable operation in dynamic environments.
- **AWS-Powered Teleoperation**: Implemented AWS-based teleoperation solutions, enabling remote control of vehicles and robots with real-time data streaming and monitoring.
- **CUDA & TensorRT Optimization:** Optimized image processing algorithms using CUDA and OpenCV for faster object detection, and integrated **TensorRT** for efficient inference on NVIDIA hardware.
- **3D Pallet Detection:** Integrated a 3D pallet detection model **of NVIDIA platforms**, enabling precise handling and identification of industrial pallets in autonomous logistics operations.

May 2023
Oct 2022

Robotics Software Engineer | VECROS, IIT DELHI, New Delhi, India

- **Autonomous Navigation Systems:** Developed path planning and navigation algorithms for autonomous drones, ensuring precise movement and obstacle avoidance.
- **Obstacle Avoidance:** Implemented advanced obstacle avoidance algorithms using Intel RealSense cameras to enable safe and efficient navigation in dynamic environments.
- **3D Mapping & Point Cloud Data:** Utilized Lidar for 3D mapping and point cloud data collection, enabling accurate environmental modeling and improving autonomous navigation capabilities.

PROJECTS

RTK and Vision-Based Navigation for Outdoor Delivery Robots **2025**

Project Link

Developed a robust outdoor delivery robot leveraging GPS-RTK for precise localization and a vision system for obstacle detection, enabling accurate and autonomous navigation in dynamic outdoor environments.

Real-World Autonomous Navigation for BOPT and Forklifts using ROS2, SLAM, and NAV2 **2024**

Project Link

Built and deployed real-world autonomous navigation for BOPT and forklifts using ROS2, integrating SLAM and NAV2 to enable map-based planning and dynamic obstacle handling in industrial settings.

Vision-to-Action Pallet Handling Pipeline for Autonomous BOPT and Forklifts in Real-World Environments **2024**

Project Link

Engineered a complete perception-to-control pipeline enabling BOPT and forklifts to autonomously detect, Align with, pick, and drop pallets using real-time vision and sensor fusion in live warehouse conditions.

Intel RealSense-Based Obstacle Detection System for Autonomous ArduPilot Drones **2023**

Project Link

Integrated depth-based obstacle avoidance algorithms into an autonomous drone system using Intel RealSense cameras and ArduPilot, ensuring safe low-altitude navigation in cluttered environments.

Vitran Drone – Autonomous Parcel Delivery Drone | e-Yantra (IIT Bombay) **2020 - 2021**

Project Link

Built a complete autonomous drone delivery system for the Vitran Drone challenge by e-Yantra (IIT Bombay), implementing ROS-based pick-and-drop functionality in Gazebo using path planning, vision, and control modules over a 6-month period.

TECHNICAL SKILLS

Programming Languages	Python, C++,
Board	Arduino Due, Teensy 4.1, STM32, Raspberry Pi, Esp32, Nvidia Jetson Orin
Deep Learning Frameworks	PyTorch, TensorFlow
Optimization Tools	cuda, numba, TensorRT
Computer Vision Libraries	OpenCV, YOLO, MediaPipe
Communication's Protocol	UART, SPI, I2C,
Operating Systems	Linux
Version control	Git, GitHub
Specific framework	ROS2 (Jazzy, humble), ArduPilot and Mav Link

CERTIFICATINS

e-Yantra Robotics Competition (eYRC 2020-21) 2020-2021

e-Yantra is a national-level robotics competition by IIT Bombay, focused on project-based learning in robotics and embedded systems.

Certification Link

LANGUAGES

Hindi ●●●●●

English ●●●●○

STRENGTHS

- Dynamic
- Motivated
- Innovative
- Adaptive