JITESH SONKUSARE

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EXPERIENCE

forREAL, inc, Danvers, MA **April 2025 - Dec 2025**

*Robotics Software Engineer - **2 PATENTS***

- Designed a unified 3D reconstruction pipeline leveraging RGB cameras (1×, 0.5×), LiDAR, and IMU, combining Gaussian Splatting, RTAB-Map–based online mesh reconstruction on iOS, and RoomPlan 3D-to-2D floor-plan extraction to produce consistent unit-level spatial representations from a single guided scan
- Implemented a spatial anchoring pipeline that lifts 2D semantic detections into 3D by combining multi-view segmentation and masking with sparse-point back-projection, enabling reliable object localization without relying on ARKit depth
- Developed a motion planning system over a continuous 3D reconstructed scene (Gaussian Splatting), leveraging graph-based planning strategies- RRT/PRM to generate smooth, geometry-aware, collision-free trajectories
- Designed LLM-powered AI agents for scene understanding, task automation, and content generation, including on-device optimization via quantization for efficient inference pipelines, enabling fine-grained unit understanding and presentation that is typically unavailable on large-scale listing platforms such as Zillow or Apartments.com

Field Robotics Lab - Institute for Experimental Robotics, Boston, MA **Jan 2025 - April 2025**

Graduate Robotics Researcher - UAV

- Designed and deployed an autonomous UAV platform supporting real-time perception, obstacle avoidance, motion planning, and closed-loop control, initially validated in Isaac Sim and later verified through real-world flight tests
- Integrated an autonomous UAV system using an ARKv6X flight controller and Jetson Orin Nano (Boson-22 carrier), incorporating ESCs, ArkFlow, GPS, telemetry radio, Nomad transmitter–receiver, power distribution, and secondary Wi-Fi, with a ROS 2-based onboard software stack enabling real-time perception, autonomy, and sensor processing

Noah Medical, Pleasanton, CA **Jan - Aug 2024**

*Robotics Software and Controls Co-op - Research and Innovation - **1 PATENT***

- **Project 1 - Augmented Reality System:** Developed AR in C++ and Python for autonomous robot guidance, integrating real-time camera and raw sensor data for virtual marker placement, improving surgical precision and product safety
- **Project 2 - IMU-based Shape Sensing:** Build a high-precision shape estimation exoskeleton for Bronchoscope in C++ and Python using IMUs as control points for cubic spline interpolation thereby improving the current system by replacing expensive optical sensors with IMUs, resulting in cost savings of several **hundred thousand dollars** for the company
- **Project 3 - Object Recognition using Computer Vision and Deep Learning:** Developed bronchoscope tip detection and angle estimation using color segmentation and deep learning in real-time, improving surgical precision and replacing costly EM sensors, leading to significant cost savings

TECHNICAL SKILLS

Languages: Python, **C++ (Data Structures and Algorithms, Solved 500+ Problems of Leetcode**), C, XML, Swift
Developer Tools: ROS, ROS2, RViz, Docker, Simulation Softwares-(Isaac Sim, Gazebo, V-rep, MATLAB, Simulink)
Algorithms: SLAM (VSlam, Lidar Slam, RGBD Slam), Path/Motion Planning- (RRT*, PRM), RL Algorithms
Hardware Skills:IMU, GPS, RTK GPS, Lidar, Cameras, Jetson Nano, Jetson Orin, Raspberry Pi, Arduino, ESP-32

PROJECTS

Sensor Fusion-Based Vehicle Localization System, Northeastern University, Boston, MA **Dec - Dec 2022**

- Designed and implemented a sensor fusion system using an Extended Kalman Filter (EKF) to estimate vehicle trajectory by fusing GPS, RTK-GPS, and IMU data. Developed modular ROS2 drivers in Python for each sensor and used MATLAB to analyze dead reckoning and velocity estimation to improve navigation during GPS outages

Autonomous Mobile Robot for Disaster Management, Northeastern University, Boston, MA **Jan - April 2023**

- Utilized Cartographer_ROS, move_base, explore_lite, RViz and ROS2 for SLAM, motion planning, obstacle avoidance, and feature extraction for empowering TurtleBot3 (Raspberry Pi, camera, and **Lidar** on-board) to navigate unexplored environments autonomously, create comprehensive maps, and precisely locate AprilTags (simulate victims)

Quadruped, Veermata Jijabai Technological Institute, India **May - Aug 2019**

- Led a 3-member team to design and build an autonomous quadrupedal robot using Python and ROS on Jetson Nano and Raspberry Pi; implemented creep and trot gait controllers and 3-DOF leg kinematics for odometry, validated in V-REP + Gazebo and replicated on hardware, achieving 50% improvement in locomotion accuracy

EDUCATION

Northeastern University, Boston, MA **Sept 2022 - Dec 2024**

*Master of Science in Robotics, **GPA 4.0/4.0***

Courses - Advanced Computer Vision, Autonomous Field Robotics, Reinforcement Learning, Foundations of Artificial Intelligence, Robot Sensing and Navigation, Mobile Robotics, Robot Mechanics and Control, Legged Robotics

Veermata Jijabai Technological Institute, Mumbai, India **Aug 2018 - May 2022**

*Bachelor of Technology in Electrical Engineering, **CGPA 9.12/10, Rank- 5/75***