

# SHAREEF BABA SHAIK

Robotics & Mechanical Engineer | ROS2 Developer | Autonomous Systems | Simulation

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**LinkedIn:** [www.linkedin.com/in/shareefbaba](https://www.linkedin.com/in/shareefbaba) **GitHub:** <https://github.com/Shareefbaba> **Portfolio:** <https://shareefbaba.github.io/>

## PROFESSIONAL SUMMARY

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Robotics Engineer with experience in ROS2, MoveIt2, Gazebo, OpenCV, and LiDAR-based 3D perception. Strong background in SolidWorks, MSC Adams, and robot system simulation. Skilled in Python, MATLAB, and sensor integration with hands-on expertise in developing, modelling, and testing autonomous and robotic systems.

## EDUCATION

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<b>Khammam Institute of Technology and Science (affiliated with JNTUH)</b>	June 2023
<i>Bachelor of Technology, Mechanical Engineering – 7.28 CGPA</i>	
<b>Jawaharlal Nehru Govt Polytechnic Ramanthapur</b>	June 2020
<i>Diploma in Mechanical Engineering - 81%</i>	

## EXPERIENCE

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### PROJECT ENGINEER (MECHANICAL & ROBOTICS SYSTEM DEVELOPMENT)

SRM UNIVERSITY – AMARAVATHI | 27-Jan 2025 – 30-July 2025

- Designed 3D mechanical models, assemblies, and robotic components using SolidWorks and performed robot simulations in ROS2, Gazebo, and MoveIt2.
- Managed complete project workflows including planning, scheduling, documentation, and execution of robotics development tasks.
- Handled procurement of components, communicated with vendors, and coordinated industrial visits for evaluating manufacturing and fabrication options.
- Assigned tasks, supervised B. Tech students and interns, and guided them in CAD design, robotics concepts, and ROS2-based development.
- Integrated sensors, motors, and actuators into the robotic system and supported testing, troubleshooting, and validation of prototypes.

### INDUSTRIAL TRAINING AT HERO SHOWROOM SERVICE AND MAINTENANCE

HERO SHOWROOM – VM BANJARA | 28-Nov 2019 - 31-May 2020

- Performed routine diagnostics, maintenance, and repair of two-wheelers.
- Assisted customers by explaining service details and recommendations.
- Handled parts inventory and maintained service-related documentation.
- Ensured adherence to safety standards and improved service workflow efficiency.

## PROJECTS

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### Autonomous Robotic System for Real-Time Pothole Detection & Repair

**Tools & Technologies:** ROS2, OpenCV, LiDAR, Depth Camera, SolidWorks, MoveIt2, Gazebo, Python, MSC Adams

- Designed and modelled the complete robotic system in SolidWorks, including mechanical structure, actuator mounts, and repair mechanism.
- Developed ROS2-based simulation environment using Gazebo and MoveIt2 for motion planning, joint control, and task execution.
- Tested 3D depth cameras and LiDAR sensors in outdoor environments and collected real pothole datasets to train and validate computer vision and detection algorithms.
- Conducted literature reviews and technical surveys and contributed to both research paper preparation and patent documentation by creating system descriptions, CAD drawings, and workflow diagrams for the robotic system.

### Autonomous Robot Navigation using Mapless Planning & LiDAR Odometry (ROS2 + Isaac Sim)

**Tools & Technologies:** ROS2, Nav2, Isaac Sim, Ouster 3D LiDAR, NVIDIA Rotary LiDAR, FAST-LIO, LIO-SAM, TF2, RViz2

- Built a **mapless navigation system** using ROS2 Nav2 where the robot navigates via LiDAR-based local costmaps without a pre-built map.

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- Integrated **Ouster 3D LiDAR** (FAST-LIO odometry) and **NVIDIA Rotary 2D LiDAR** (Nav2 obstacle avoidance) using Isaac Sim → ROS2 pipelines.
- Configured Nav2 **local planners** (RPP, DWB, TEB), TF2 frames, costmaps, and velocity command pipelines for real-time navigation.
- Evaluated odometry drift and SLAM behavior using **LIO-SAM**, improving understanding of LiDAR perception and autonomous navigation.

**GitHub:** <https://github.com/Shareefbaba/autonomous-navigation-pipeline-FAST-LIO-LIO-SAM-Nav2-Isaac-Sim->

## Mobile Robot with 2-Axis Arm (Gazebo + RViz2)

**Tools & Technologies:** ROS2, Gazebo, RViz2, URDF, XACRO, TF, Depth Camera, Python

- Simulated a mobile robot equipped with a 2-DOF manipulator in Gazebo and ROS2.
- Created URDF and XACRO models, incorporating TF frames for accurate simulation.
- Integrated a depth camera on the robot and visualized sensor and joint data in RViz2.
- Demonstrated complete mobility + manipulation behavior in simulation.

GitHub Repo: [https://github.com/Shareefbaba/mobile\\_robot\\_Gazebo\\_project](https://github.com/Shareefbaba/mobile_robot_Gazebo_project)

## Snake Game – Python-Based Interactive Console Game

**Tools & Technologies:** Python, Pygame, OOP Concepts, Algorithm Design

- Developed a classic Snake Game using Python and Pygame with well-structured OOP.
- Implemented collision detection, scoring logic, and real-time movement.
- Designed intuitive controls and dynamic difficulty adjustments.

GitHub Repo: <https://github.com/Shareefbaba/Snake-Game>

## DIY Projects

- Obstacle Avoiding Robot, Line Following Robot, Mobile-Controlled Robot, Voice-Controlled Rover.

## TECHNICAL SKILLS

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**Programming:** Python, C++ (ROS2), MATLAB (Basic), SQL (Basic)

**Robotics Frameworks:** ROS2, MoveIt2, BT.CPP, TF2, URDF/XACRO, Nav2, Ros2 Nav2 stack.

**Simulation Tools:** Gazebo Classic/Ignition, RViz2, Isaac Sim

**Vision & Perception:** OpenCV, Open3D, LiDAR Processing, ZED 2i Depth Camera, Costmap Generation

**Localization & SLAM:** FAST-LIO, LIO-SAM, SLAM Fundamentals, Odometry Drift Analysis, Sensor Fusion Concepts.

**Mechanical Design:** SolidWorks, CATIA, AutoCAD, MSC Adams, ANSYS, 3D Printing

**Embedded Systems:** Arduino, Motor Drivers, Servo Systems, IR/Ultrasonic Sensors, IMU, LiDAR

**Data Science:** Machine Learning, EDA, Data Wrangling, Visualization

**Software Tools:** Git, GitHub, VS Code, Jupyter, PyCharm, Power BI

**Soft Skills:** Project Management, Leadership, Teamwork, Problem Solving, Documentation

## CERTIFICATION

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- CATIA – Internshala
- Arduino Complete Course (30+ Projects) – Udemy
- ROS2 for Beginners – Udemy
- ROS2 Level 2 (TF, URDF, RViz, Gazebo) – Udemy
- IBM Data Science Professional Certificate – Coursera

## ACHIVEMENTS

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- State 5Th rank in Aerospace Engineering Exam TSPGCET-2023
- 6.0 Band in IELTS
- Qualified in Ts Constable Physical Test -2022