AKSHAY MAHALLE

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Master's student in Robotics with expertise in Robotics Software Engineering and Control Systems, seeking internship and full-time roles in Robotics, Automation, and Computer Vision.

EDUCATION

Arizona State University, *MS in Robotics and Autonomous Systems* | Arizona, USA — GPA: 4.0/ 4.0 — May 2025
Pune University, *B.E in Mechanical Engineering* | Pune, India — GPA: 4/4 — Aug 2022

Finalists: SAE BAJA (eYRC) & Bachelor's Capstone Project in Mechanical Department
Patents: Published a Design Patent: [View Patent]
Courses: Control Systems | ML | DL | Mechatronics | UAVs | Perception | Optimization | RL | Multi-Robot Systems

EXPERIENCE

Dreams Lab, *Research Assistant - Robotics Engineer* | Arizona, USA — Jan 2023 - Present
- Created a Digital Twin for Virtual Shake Robot to enable real-time PBR rock dynamics testing for hazard analysis.
- Engineered a ROS2-integrated PyBullet simulation of the physical shake table, enhancing predictive accuracy by 81%..
- Optimized inertia calculations using Autodesk Fusion 360, improving simulation fidelity by 72%.

Piaggio Private Limited, *Design Engineer* | (Pune, India) — Aug 2022 - Jun 2023
- Designed commercial vehicle components using Creo and SolidWorks, improving design efficiency by 6%.
- Researched automotive performance enhancements, implementing modifications that increased vehicle efficiency by 8%.
- Collaborated with cross-functional teams to refine vehicle aerodynamics, leading to a 5% improvement in fuel economy.

KSB Private Limited, *Mechanical Intern* | India — Aug 2019 - July 2020
- Simulated automotive performance in Gazebo and ROS, improving model accuracy by 24%.
- Automated MAZAK CNC machining processes, reducing operational costs by 15%.
- Led the development of an automotive helper robot, optimizing project workflow efficiency by 11%.

SKILLS

Languages	Python, C/C++,embedded C,Catkin, CUDA, CMake, Matlab, Git, Bash, LaTeX, Vim, PCL, I2C
Robotics	ROS 1/2, V-Rep, Gazebo, Ansys, MoveIt, MuJoCo, FEA, CFD, Arduino, Pybullet, Sensor Fusion, PLC
Software	Linux, Tensorflow, Pytorch, Docker, OpenCV, PTC Creo,Rviz, CorelDraw, Solidworks, Fusion360
Certifications	Aerial Robotics, UPenn – (2021)	IBM - Image Processing(2023)	Python Bootcamp (2021)

PROJECTS

My-Cobot (Industrial Robot) | Arizona State University – Project — Aug 2023 - Dec 2023
- Built a 6-DOF myCobot simulation for industrial applications, improving task automation and precision.
- Implemented forward and inverse kinematics models, achieving highly accurate motion planning.
- Integrated MATLAB Simulink and Python for real-time system simulation, enhancing testing efficiency..

Virtual Shake Robot – *Dreams Lab* Project — Jan 2024 - Present
- Developed the Digital Twin of the Virtual Shake Robot to analyze PBR rock dynamics under seismic conditions.
- Utilized ROS2 and PyBullet Physics Engine to create a high-fidelity simulation of the physical shake table.
- Conducted precise inertia calculations in Autodesk Fusion 360, improving simulation accuracy and performance.

Multi-Robot Autonomous Exploration – *Arizona State University* Project — Aug 2024 - Dec 2024
- Designed a ROS2-based multi-robot framework integrating SLAM and decentralized exploration for efficient navigation.
- Developed a scalable ROS2 architecture in Gazebo and RViz to enable real-time monitoring of multiple robots.
- Implemented collision avoidance and adaptive mapping to improve exploration efficiency in unknown environments.

Optimized VoxFormer: 3D Semantic Scene Completion (Autonomous Driving) – Project — Nov 2022 - Dec 2022
- Optimized the VoxFormer model by integrating MobileNet for efficient 3D semantic scene completion, reducing the computational load while maintaining high accuracy.
- Performed comparative analysis against state-of-the-art models, demonstrating superior performance in short-range scenarios with reduced resource consumption.

Automotive Helper Robot - *KSB Private Limited* — Aug 2021 - Nov 2021
- Automated the development pipeline using Arduino and Python, reducing coding and testing time by 30%.
- Enhanced robot efficiency by 20% with advanced sensors and actuators, emphasizing innovative design.
- Simulated obstacle avoidance scenarios in Gazebo to refine robotic path planning under dynamic conditions.

Neckband for Speech Assistance (Arizona State University) – Project — Jan 2024 - Present
- Collaborated with Barrow Neurological Institute to develop a wearable neckband assisting individuals with Parkinson's in regulating speech volume through adaptive vibration feedback.
- Engineered a dual-microphone system and real-time signal processing to analyze ambient noise and user speech, dynamically adjusting tactile feedback for improved communication.