Muhammad Ibraheem

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TECHNICAL SKILLS

- **Robotics & AI:** ROS/ROS2, Gazebo, Pytorch, SLAM, Reinforcement Learning
- **Programming:** Python, CUDA, C++, SQL, Linux, Docker
- **Engineering Tools:** SOLIDWORKS, Creo, ANSYS, MSC Adams

EDUCATION

MS Robotics and Autonomous Systems (Systems Engineering) **08/2025 – 05/2027**
Arizona State University, Tempe, AZ GPA: 3.89

BS Mechanical Engineering **08/2018 – 02/2023**
Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (GIKI) Topi, Pakistan

PROJECTS

Nonlinear Peer-Aware Cost Estimation **08/2025 – Ongoing**
Ongoing Research Project at GHOST Lab Tempe, AZ

- Programmed a mobile robot to move based on a nonlinear cost function
- Calibrated a motion capture system to detect the real-time position of two rigid bodies
- Developed ROS nodes in C++ for real time control of the robot and feedback collection
- Used Enhanced Kalman Filters (EKF) to reduce noise in motion capture data
- Applied Model Predictive Control (MPC) to control the robot's movement

Natural Language Controlled Pick and Place Robot **11/2025 – 12/2025**
Arizona State University Tempe, AZ

- Programmed a robot to pick and place different colored and sized blocks based on user's instructions
- Created a ROS2 node called orchestrator that delegated tasks to other nodes using ROS2 actions
- Stereoscopic 3D perception algorithm to identify size and depth of blocks

Maze Solving Robot **09/2025 – 10/2025**
Arizona State University Tempe, AZ

- Used OpenCLIP VLM as a supervisor agent to trigger the maze-solving pipeline
- Leveraged Yolo and CV2 for computer vision and isolate the maze region
- Implemented A* search to find the solution to the maze
- Enhanced performance using multi-threading to segregate the motion control and maze detection modules

Design and Control of Throat Swab Sampling Robot **07/2021 – 05/2022**
Final Year Project (Capstone Project) Topi, Pakistan

- Achieved the 3rd position in the industrial open house of 2022 out of 25 competing groups
- Designed the robot using SOLID Works and MSC Adams for dynamic analysis
- Simulated the inverse kinematic equations for calculating joint angles in MATLAB
- Developed ROS nodes for controlling the robot over the network
- Tuned the control parameters and sensors to work on the real robot

PROFESSIONAL EXPERIENCE

Tkxel (Software and AI Consultancy) **12/2023 – 07/2025**
Data Scientist Lahore, Pakistan

- Helped clients improve productivity and solve business problems using ML and AI
- Trained a Neural Network in Pytorch that estimated software engineering effort with a 15% error
- Used Bayesian Inference with LLMs to audit cybersecurity compliance records of corporations
- Developed an AI diagram generator that reduced solution diagram generation time by 50%
- Built a multi agent organizational AI Assistant with document level authorization built-in