ASHIQ RAHMAN ANWAR BATCHA

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OBJECTIVE

Highly motivated robotics engineer, adept at perception, path-planning, motion control, and SLAM, eager to leverage these skills to design innovative and practical robotic solutions that revolutionize.

SKILLS

Programming Languages:	Python, C, C++, MATLAB.
Coding Software:	MATLAB-Simulink, Pybullet-Gym, ROS2, Gazebo, MoveIt, OpenCV, Docker.
CAD Software:	Inventor, Solid Works.
Other Software:	Microsoft Office, Google Workspace.
Operating Systems:	Windows, Linux.

PROFESSIONAL EXPERIENCE

Graduate Student Employment and Training - Research Assistantship — AI4CE NYU lab   2024

- Led a team in developing a versatile testing mobile manipulator platform to assess and validate diverse research projects and concepts.
- Successfully implemented algorithms to open and close doors using the platform.

Research Assistantship — AI4CE NYU lab   2023-2024

- Created dataset to train a Neural Network for accurate agent and object localization in the global coordinate system.
- Worked on the integration of hardware components with the trained model and policy, achieving successful execution of object picking and placing within the scene.

Mechatronics Intern — Solinas Integrity Pvt. Ltd.   2022

- Created an inspection bot for industrial pipelines up to 250 meters, with a precise 0.5-meter localization system within 300-meter segments.
- Mapped pipelines' internal structures using data from LiDAR, Encoders, and IMU for effective inspection and analysis.

PROJECTS

Brick Laying — Tracer-UR5 Robotic System   2024-Current

- Developed a system integrating UR5 robot and AgileX Tracer for automated construction tasks, enabling precise bricklaying capabilities.
- Designed and implemented algorithms for seamless synchronous control of the UR5 and AgileX Tracer robots, powered by a 24-volt DC system.

DoorDash — Husky-Xarm Robotic System   2024-Current

- Integrated Husky mobile robot with Xarm manipulator arm, enabling automated door opening, package delivery, and object manipulation across rooms.
- Successfully combined Husky's mobility platform with Xarm's manipulation capabilities for a versatile robotic solution.

Mobile Manipulation - Build Structures — **2023-Current**

- To push objects in an environment to build 2D structures with just a monocular RGB Camera.

- Trained a model using reinforcement learning for a mobile robot, enabling autonomous navigation and 2D structure construction, addressing challenges in adaptability, collision avoidance, efficiency, and precision.

Autonomous Maze Solving Robot — **2023-2024**

- To find the target location in a maze with just a monocular RGB camera mounted on the robot.

- Implemented algorithms like SIFT, A* path planning, and Vanishing Points in the navigation phase for efficient maze traversal.

Sensor Fusion and State Estimation for Aerial Robot — **2022-2023**

- Implemented EKF, UKF, and visual localization in MATLAB and Simulink, integrating IMU, VICON, and Camera data for aerial robot state estimation.

- Addressed non-linearities and uncertainties, achieving precise robot localization via sensor fusion.

Autonomous Package Delivery Drone - Robotics Club of CEG — **2021-2022**

- Led the A* path planning algorithm, dynamic obstacle avoidance, and trained model tracking.

- Achieved destination accuracy using sensor fusion-based localization and camera input for package detection/delivery with Google API assistance.

Intelligent Line Marking Bot - Kurukshetra CEG — **2021-2022**

- Developed ROS-based localization and obstacle avoidance algorithms on Raspberry Pi.

- Achieved high path tracking accuracy using a 2D lidar-based obstacle avoidance algorithm.

3-UPS 1-UPU Parallel Manipulator - Final Year Project — **2021-2022**

- Created a 5-DOF parallel manipulator with 1 additional DOF at the end effector for enhanced workspace mobility.

- Simulated the configuration's behavior at various points using developed kinematics.

Manhole Operating Bot-Kurukshetra CEG — **2019-2021**

- Developed sensor fusion algorithms for precise perception across multiple modalities.

- Researched environment mapping using camera data and contributed to control algorithms, achieving 5-10 cm bot accuracy.

EDUCATION

Master of Science in Mechatronics and Robotics Engineering — 2022 - 2024
New York University Tandon School of Engineering — 3.5/4.00 CGPA