ASHIQ RAHMAN ANWAR BATCHA

Brooklyn, New York, 11201 | ashiq.rahman@nyu.edu | 5513446796

LinkedIn | Portfolio | Github

Areas of Interest: Perception, Path-Planning, Motion Control, SLAM, Kinematics, and Dynamics (Robotics).

TECHNICAL SKILLS

- **Programming Languages:** Python, C, C++, MATLAB.
- **Coding Software:** MATLAB - Simulink, ROS – Gazebo, Pybullet-Gym, ROS2, MoveIt, Arduino, OpenCV, Docker.
- **Hardware Used:** Raspberry Pi, Jetson Nano, Jetson TX2, Teensy, Arduino, STM32.
- **CAE Software:** Inventor, Solid Works.
- **Other Software:** Microsoft Office, Google Workspace.
- **Operating Systems:** Windows, Linux.

PROFESSIONAL EXPERIENCE

GSET-Research Assistantship under Professor Chen Feng | AI4CE NYU lab   2024
- Engaged in research activities utilizing UR5 and Husky robots.
- Developing a versatile testing platform to assess and validate diverse research projects and concepts.

Research Assistantship | AI4CE NYU lab   2023-2024
- Created real-world 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 meters localization system within 300-meter segments.
- Mapped pipelines' internal structures using data from LiDAR, Encoders, and IMU for effective inspection and analysis.

RESEARCH EXPERIENCE

Flexible Gripper | Anna University   2022
- Researched flexible gripper designs and pinpointed an efficient design for various object gripping.
- Implemented a two-finger gripper on a UR5 robot, achieving a 90% success rate in object pickup through electrical actuation.

PROJECTS

Mobile Manipulation - Build Structures   2023-2024
- To push objects in an environment to build 2D structures with just 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, 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 nonlinearities 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.

Design and Fabrication of a 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.

ScavengeX (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.

ACADEMIC PROFILE

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