Archit Hardikar

LinkedIn | GitHub | Portfolio | architnh@seas.upenn.edu | +18628420949

Education

University of Pennsylvania — *Master of Science - Robotics,* ***GPA: 3.72/4***
University of Pune — *Bachelor of Technology - Mechanical,* ***GPA: 4.00/4***

Skills

Programming: ROS, ROS2, Python, C++, MATLAB, C, Bash Script, Linux, Docker

Technologies: Git, Simulink, Pytorch, Tensorflow, Opencv, Arduino, Ansys, Solidworks

Experience

Robotics Intern, Maglev Aero Inc. (MassRobotics) *June 2022 - Aug 2022*

- Airfoil pitching aerodynamic force analysis and Fast Fourier Transform. Set up coordinate frame transform toolbox for transforms from aeroplane to ground frame. Eauler angles, and quaternions.
- Implemented Kalman Filter for eVTOL magnetic levitation.

Participant and Volunteer, IEEE RAS ICRA 2022 *May 2022*

- Competed in the 10th International F1Tenth Autonomous Grand Prix. Second fastest autonomous car lap time.

Associate Engineer, Eaton Aerospace *Dec 2020 - Aug 2021*

- Contribution to two **Intellectual Property** disclosures, **INCOSE** Research Paper, **Trade Secret**.
- Implemented Deep Neural Network for Engineering Drawing text extraction. NLP, k-NN and segmentation. Image processing, feature detection with using Opencv. (50% TAT reduction, 260,000$ annual savings).

Project Trainee, Mercedes Benz India Ltd. *June 2019 - Dec 2019*

- Programmed 6-axis KUKA robots, implemented production line setup for 5 new cars. Kaizen for 20% cycle time reduction (50,000$ yearly savings), created Calibration Alert Tool.

Projects

Vision based Opponent Overtaking using Inverse Perspective Mapping

- Opponent car detection using R-CNN, tensorflow and TensorRT. Lane detection, path planning using RRT* based splines. Inverse perspective mapping view generation, and depth perception using 4 Intel Realsense d435i cameras.

Instantaneous Motion Planning using RRT, RRT* | *GitHub*

- Implemented Rapidly Exploring Random Tree (RRT) and RRT* for local path planning. RRT* based Spline path follow for dynamic obstable avoidance. Localization using Adaptive Monte Carlo (AMCL) Particle Filter.
- Hector Odometry for 2D map generation and Pure Pursuit along spline for racing. Programming in C++, ROS2, bash shell.

Iterative Close Point Scan Match for SLAM (Simultaneous Localization and Mapping)

- Implemented Simultaneous mapping - Point to Line Iterative Close Point scan match on occupancy grid in C++.

Deep Learning for Computer Vision | *GitHub*

- Trained YOLO, SOLO from scratch for fast real time multi object detection using Pytorch.

Path Planning for 7 DOF Robotic Arm using A*, RRT. Pick and Place competition Fall 2022 | *GitHub*

- Implemented A* and RRT algorithms for the 7-dof Franka Emika PANDA robotic manipulator arm in ROS. Solved the pick and place task for static and dynamic blocks.

Autonomous Battle Robot for GTA-2021 competition (UPenn)

- Designed and built an autonomous wall following robot. Localization using HTC Vive in C. Obstacle detection, frequency detection and wall following.

Extracurricular Activities

Lab development Assistant (MEAM 520) - Implemented vision planning for FRANKA Panda robotic arm.

Teaching Assistant (MEAM 510) - Held weekly office hours, recitation.

Discovered a new bird species for first time in South India - IndianBirds Vol. 15. No. 5 | *Credential*

Achievements

Best Outgoing Student, Institute Topper (2020)

E-Star award for developing automation tools (Eaton, 2021)

Mercedes Star award for high performing managers (Mercedes Benz, 2019)