

Archit Hardikar

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 LinkedIn |  GitHub |  Portfolio

EDUCATION

University of Pennsylvania

Philadelphia, USA

Masters of Science- Mechanical Engineering and Applied Mechanics (Robotics); GPA: 3.7/4.0 Aug 2021 - May 2023

University of Pune

Pune, India

Bachelor of Technology - Mechanical Engineering; GPA: 4.0/4.0

May 2016 - Aug 2020

SKILLS

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

Technologies: Git, Arduino, Simulink, Ansys, Solidworks

Languages: English (Professional), German (Limited), Marathi (Native), Hindi (Native), Sanskrit (Limited)

PROJECTS

Vision based Opponent Overtaking using Inverse Perspective Mapping

- Opponent car detection using R-CNN. 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 obstacle 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 map using C++. Then compared results with Hector SLAM and Particle Filter package for state estimation and map localization.

Lane detection and vehicle classification using CNN computer vision (YOLO) | [GitHub](#)

- Computer Vision using cv2, opencv- Road car detection using convolutional neural networks and autoencoders. Non-maximum suppression and sliding window for bounding boxes. Achieved 0.86 test accuracy. Implemented lane detection and Camera calibration, distance calculation.

Path Planning for 7 DOF Robotic Arm using A*, RRT

- Implemented A* and RRT algorithms for the 7-dof Franka Emika PANDA robotic manipulator arm in ROS using Python.
- Solved the pick and place task. Rotations and translation using Homogeneous transformations.

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.

EXPERIENCE

University of Pennsylvania

Philadelphia, USA

Graduate Research Assistant

Feb 2022 - April 2022

Eaton India Innovation Center LLC, Aerospace Department

Pune, India

Associate Requirements Engineer, SDE

Dec 2020 - Aug 2021

- Contribution to two Intellectual Property (IP) disclosures, a Research Paper and a Trade Secret.
- Implemented digitization tool for scanned Engineering Drawings to database digitization. NLP, data clustering and segmentation. Profile analysis using computer vision opencv. (80% TAT reduction, 80,000\$ annual savings).
- Developed Graphical User Interface for a smart hose directory search tool.

- Developed a requirements assessment tool for data validation using semantic textual similarity, NLP. (50% TAT reduction, estimated 180,000\$ annual saving).
- Other responsibilities: Requirements capture, analysis, validation and assessment for global Aerospace companies. Successfully handled Requirements Report (100% On Time Delivery and 100% First Pass Yield).

Mercedes Benz India Ltd.

Pune, India

Project Trainee

June 2019 - Dec 2019

- Skills developed: 6-axis robot, Kaizen (Continuous improvement), Macros, VBA.
- Programmed 6-axis KUKA robots in paint shop, body assembly shop.
- Implemented line setup and line balancing for 5 new cars/ models. Kaizen for 20% cycle time reduction- overhead glass gluing station. (50,000\$ yearly savings).
- Created an Automation Tool for a Calibration Alert System using Excel VBA macros and access database.

TRADE SECRET

Automatic Engineering Drawing Digitization Data Extraction Tool (Classified Trade Secret - ITAR)

RESEARCH PAPERS

Automation and Digitization of Systems Engineering tools (INCOSE)

Addition of Rosy Pipit Anthus roseatus to the avifauna of Peninsular India

(IndianBirds journal- Vol. 15. No. 5) | *Credential*

CERTIFICATES

Neural Networks and Deep Learning, DeepLearning.AI | *Credential*

Machine Learning, Stanford Online | *Credential*

ACHIEVEMENTS

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

First rank in BTech.- batch of 2020. (VIT Pune, 2021)

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