Archit Hardikar

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+1(862)842-0949 | Philadelphia, Pennsylvania, USA

Skills

Languages: ROS1, ROS2, Python, C++, MATLAB, C
Software: Ansys, MATLAB Simulink, Controls system toolbox, Solidworks

Education

Master of Science (MS) in Applied Mechanics (Robotics) Aug 2021 - May 2023
UPenn, Philadelphia, USA

Bachelor of Technology (BTech) in Mechanical Engineering Aug 2016 - Sept 2020
University of Pune, India

Work experience

University of Pennsylvania Philadelphia, USA
Graduate Research Assistant Feb 2022 (ongoing)

Eaton India Innovation Center, India Pune, India
Associate Engineer (Aerospace) 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 savings)
- 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., India Pune, India
Project Trainee Jun 2019 - Dec 2019

[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.

Academic Research/ Projects

Instantaneous Motion Planning using RRT University of Pennsylvania
Feb 2022- April 2022
Implement Rapidly Exploring Random Tree (RRT) algorithm for path planning, obstacle avoidance. Localization using Adaptive Monte Carlo (AMCL) Particle Filter. Hector Odometry for 2D map generation and Pure Pursuit along spline for close loop circuit racing.

Localization and Pose Estimation - SLAM and Particle filters University of Pennsylvania
Feb 2022 – March 2022
Demonstrated Point to Line Iterative Close Point scan match on occupancy grid map. Particle Filter for state estimation and map localization. Pure pursuit for locomotion.

Autonomous F1 tenth racing car –reactive path planning University of Pennsylvania
Jan 2022 – Feb 2022
Wall follow in close loop circuit using Hokuyu 2D LIDAR scans using ROS2 and C++. Safety node to prevent car crash. PID tuning and design of control system for steering through gaps.

Road image object detection using computer vision and YOLO University of Pennsylvania
Oct 2021 – Dec 2021
Computer Vision- Road car detection using convolutional neural networks and autoencoders. Non-maximum suppression and sliding window for bounding boxes. Achieved 0.86 test accuracy.

Autonomous Battle Robot for GTA-2021 competition (UPenn) University of Pennsylvania
Oct 2021 – Dec 2021
Designed and built an autonomous wall following robot. Localization using HTC Vive in C. Obstacle detection, frequency detection and wall following.

Trade Secret

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

Research Publications

- ‘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) [Link]

Certifications

- Neural Networks and Deep Learning (Stanford Online) [credentials]
- Machine Learning (Stanford Online) [credentials]

Awards

- ‘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)