Sagnik Ghatak

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Portfolio

- **Github:** click here.
- **LinkedIn:** click here.

Projects

EKF Sensorfusion

Github

- Simulated px4vision drone in Gazebo using PX4 AUtopilot and ROS2 using MicroXRCEAgent as communication protocol.
- Implemented a localization module by fusing sensor data from IMU and GPRS using Extended Kalman FIlter

Echo-bot

Github

- Developed an autonomous bot with SLAM capabilities using ROS2 and simulate it in Gazebo
- Integrated sensor plugins like Depth Camera, LiDAR and control plugins like ros2control
- Implemented Nav2 module to integrate autonomous capacities.

Local-Path-Planner-for-Evasive-Maneuvors-of-Automated-Vehicle

Github

- Developed a local path planner for executing robust evasive maneuvers around obstacles, utilizing a bicycle model and PID controller.
- Achieved improved navigation accuracy and enhanced obstacle avoidance in dynamic environments.

Reinforcement Learning: Tower of Hanoi

Github

- Designed and implemented a custom environment for the Tower of Hanoi using the Gymnasium framework.
- Developed a Q-learning agent to solve the Tower of Hanoi problem.
- Trained the agent with various parameters and visualized the learning process and results.
- Utilized reinforcement learning techniques to optimize the agent's performance in solving the puzzle efficiently.

Relevant Experience

Schanzer Racing Electric e.V. - THI Racing Team (Voluntary) — **Ingolstadt, Deutschland**
Team Member - Driverless — *Oct 2023 – August 2024*

- Designed and implemented Camera Perception Stack using Yolov8 and RansacPnP
- Designed a dual Extended Kalman Filter (EKF) system for robust sensor fusion, integrating steering angle sensors, wheel odometry, and GPS data to enhance vehicle state estimation.
- Designed a path planning algorithm for autonomous driving in dynamic environments to generate optimized paths for acceleration and maneuvering, ensuring precise and adaptive navigation.
- Simulated and validated the autonomous system components within a ROS2 workspace, ensuring seamless inter-node communication and real-time performance in a production-like environment.

Education

M.Eng - AI Engineering of Autonomus Systems — **Ingolstadt, Deutschland**
Technische Hochschule Ingolstadt, 2.3 GPA — *October 2023 – Present*

B.Tech - Electrical Engineering — **Kolkata, India**
St. Thomas' College of Engineering and Technology, 1.8 GPA — *August 2017 – June 2021*

Certificates

Supervised Machine Learning: Regression and Classification (DeepLearning.AI)

Advanced Learning Algorithms (DeepLearning.AI)