Sagnik Ghatak

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About Me

I am an aspiring AI researcher with a strong background in machine learning and a keen interest in advancing autonomous systems. I am passionate about developing intelligent, self-sustaining technologies and eager to contribute to innovative AI-driven projects. I am motivated by the intersection of research and real-world application and, am actively working towards building a career in this exciting field.

Portfolio

○ **Github:** click here.
○ **LinkedIn:** click here.

Skills and Interests

Languages: Python, SQL, C++, Unix/Bash Scripting

Frameworks: Pandas, Numpy, Scikit-Learn, Matplotlib, ROS2, PyTorch, Flask

Simulation: Gazebo, Simulink

Platforms: PyCharm, Jupyter Notebook, Visual Studio Code

Soft Skills: Problem Solving, Communication.

Technical Interests: Mapping, Localization and Path Planning, Reinforcement Learning, Machine Learning and Data Science, Exploratory Data Analysis and Data Visualization, Data Pre-processing and Feature Engineering

Projects

Echo-bot
Github
○ Developed an autonomous bot with SLAM capabilities using ROS2 and simulate it in Gazebo

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.
○ Built a reinforcement learning agent to adapt in the tower of hanoi environment using Deep Q-Network(DQN)

Work Experience

Unicredit Spa   **Munich, Germany**
Working Student - Financial IT   *September 2024 – Present*
○ Used statistical machine learning models to analyze financial data for risk assessment and fraud detection.
○ Supported the creation of dashboards and reports in Power BI for real-time financial insights and decision-making.

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

- 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.

Cognizant India   **Kolkata, India**
Programmer Analyst   *October 2021 – September 2023*

- Engineered ETL processes with Informatica PowerCenter, cutting data processing time by 30%.
- Automated tasks with UNIX and Python scripts, reducing manual intervention by 60%
- Enhanced database performance by 20% with optimized SQL queries, decreasing execution time by 15%.

PrepInsta India   **Remote**
Intern   *January 2021 – July 2021*

- Applied statistical machine learning techniques to analyze student data and enhance personalized learning experiences.
- Assisted in developing dashboards and reports in PowerBI to track educational performance and student progress.

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*

Voluntary Work

Certificates

Azure Data Fundamentals (Microsoft)

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

Advanced Learning Algorithms (DeepLearning.AI)