

Project: Self-Driving Cars

Description:

The project focuses on developing a self-driving car system using machine learning and artificial intelligence to enable clear navigation on roads. The primary objectives include creating an AI model that can effectively drive, identify and respond to various obstacles, follow traffic regulations, and ensure safe driving practices. The self-driving car system will have features such as detecting pedestrians and vehicles, stopping at crosswalks, slowing down for obstacles, and obeying traffic signals and signs.

Proposed Approaches:

- **Deep Learning and Computer Vision** Utilize neural networks and object detection algorithms to process real-time data from the object's sensors. This will help in identifying pedestrians, vehicles, traffic signals, and stop signs.
- **Reinforcement Learning** Implement the techniques to train the self-driving car to make decisions based on its perception of the environment. The car will learn to optimize its driving behavior through trial and error, taking into account rewards for safe and efficient driving actions.
- **Genetic Algorithms** Genetic algorithms can be employed to optimize certain aspects of the self-driving car's behavior, such as path planning and traffic signal attention.

Expected Results/Goals:

- **Safe Autonomous Driving** The primary goal is to develop a self-driving car system that can navigate roads safely and follow traffic regulations.
- **Pedestrian and Vehicle Detection** The AI model should accurately detect pedestrians and vehicles, allowing the car to react appropriately to their presence.
- **Traffic Signal and Stop Sign Recognition** Ensure that the self-driving car can recognize and respond to traffic signals and stop signs effectively.
- **Obstacle Avoidance** Implement algorithms that enable the car to slow down and avoid obstacles in its path.
- **Human-like Driving Behavior** Strive to achieve driving behavior that mimics the decisions and actions of a skilled human driver.

Division of Work:

- **89221037:** Deep Learning and Computer Vision - Focus on developing the neural networks and computer vision algorithms for object detection and perception.
- **89221061:** Reinforcement Learning and Genetic Algorithms - Focus on implementing reinforcement learning techniques for decision-making and integrating genetic algorithms for optimizing driving parameters and behavior.