AWS DeepRacer - Object Avoidance Proposal

Problem statement

Develop, train, and test a simulated autonomous vehicle using AWS DeepRacer and reinforcement learning to avoid objects on roadways.

Context

The global autonomous vehicle market size is projected to be valued at $54.23 billion in 2019, and is projected to garner $556.67 billion by 2026.[1] This project will focus on object avoidance because safety is a major concern for self-driving cars.

Criteria for success

Educational project to learn how:

- AWS DeepRacer works.
- reinforcement learning models are developed, trained, tested, and evaluated.

Scope of solution space

Will develop and analyze everything within the AWS DeepRacer console.

Constraints

Time is the main constraint because there are many different models and methods that can be used. Will discuss various possibilities during weekly mentor meetings to get feedback as needed to help address this issue.

Costs are also incurred while the models are starting up, training, and shutting down. Since this project is only going to use the AWS DeepRacer console most of these costs will be minimal and cleaning up afterwards is done automatically. There are several additional costs and maintenance items that would need to be accounted for if this project was ever expanded outside of the console.

Stakeholders

Me for learning purposes.

Data sources

AWS has extensive documentation on DeepRacer. One of them is the AWS DeepRacer - Developer Guide. Also, there are several sample projects on github that provide starting examples. A couple of them are the aws-deepracer-workshops and AWS DeepRacer Community.

References

1) Akshay Jadhav (2018). Autonomous Vehicle Market.