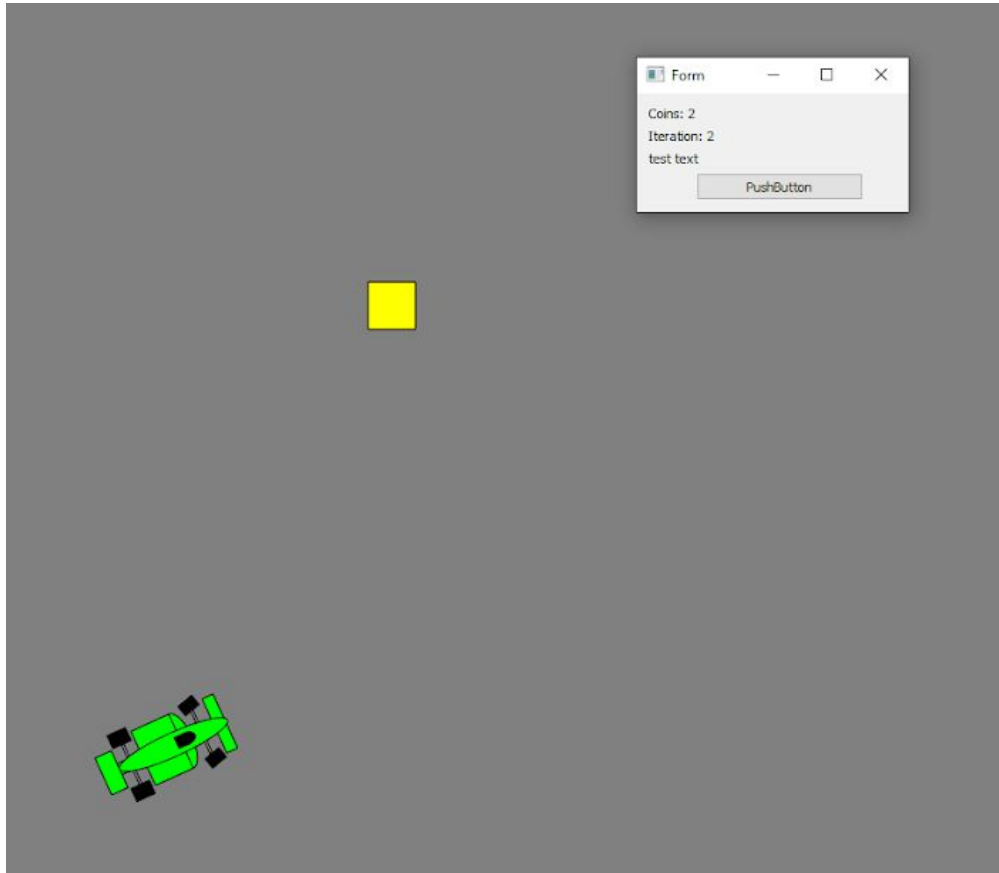Chris Mills-Bowling

Samuel Arteaga

Megan Jean Peters

481 Project Checkpoint #3:

AI-Self Driving Coin Collecting Car

Situation:

The Artificial Intelligence will control a vehicle in a stage and attempt to capture all yellow block coins on the map. The AI will utilize controls for the car which are: Accelerate, Decelerate, Right Turn, Left Turn. Upon completion of the collection of the coins the AI will have complete its task for the given iteration and the program will stop recording AI actions and compile an iteration report for the AI allowing the decisions made by the AI in this generation to be viewed by future generations for machine learning purposes.
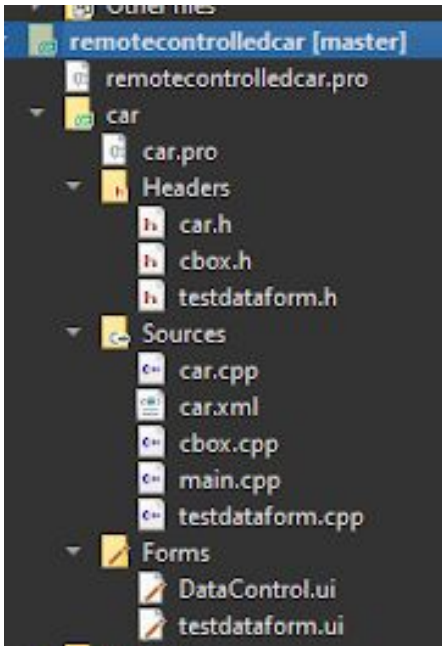
Current Application Structure:

→ Car.h/.cpp: Controls the drawing and interfaces for the controls for the AI to command. Will also report data on position, speed, and direction as a package. Controls the drawing of the vehicles.

→ CBox .h/.cpp: CBox stands for Counter Box which is the target for the driving AI to collect. This is a simple class structure that draws collectables in the application stage that signals a pickedUp() signal when the vehicle drives over it which the application package as information for the AI to process later.

→ TestDataForm .ui/.h/.cpp: Simply the GUI controller for the Application filled with useful data for the simulation which allows users to control the AI test and read about the current data.

AI Progress:

Currently we utilize a simple heuristic AI that is to test the environment itself with no data/goals. The AI is able to move and turn the vehicle successfully which was the most important part of the setup of this project since we are now able to implement our AI plans.
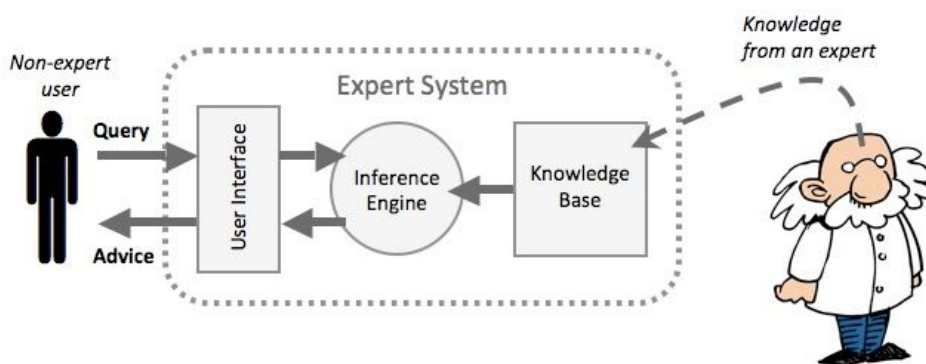
In the future: We plan to utilize machine learning to have our AI complete the CBox collecting task. The specific design we intend to implement is Expert System Design theory. This system has very simple goals and initiative rules which lends itself to the setup of ESD theory w/ machine learning. As seen in the above diagram it works on a two part system of an inference engine utilizing a set of rules or knowledge which allows for experts to add as much information and rules as possible. In the instance of our driving AI, due to the simple nature of the task, writing expert or helpful rules is something very easily done. Combined with information

from previous iterations of the experiment the AI can become more and more experienced with the given subject matter of collecting coins with it's green race car.