Autonomous Car Project

The autonomous car project is modeled on the Donkey car project. An open source artificial Intelligence self-driving car that models it’s driving on a human driver. The software is written in Python and runs on the Raspberry Pi 3 in conjunction with an x86 based PC.

To train the AI we first record a human driving the car around a track. The donkey car software on the Pi that we have attached to the RC car records, through the use on the installed camera, the images of the track, along with the speed and turning information. All that data is stored into what is called the “tub”. The tub is a directory on the micro SD card installed on the Raspberry Pi. Once the data is collected into the tub, we then transfer it to a PC running the donkey car software. The Raspberry Pi doesn’t have the processing power to train the AI, so we offload the data to a more powerful PC that can do the work. Then we transfer the results back to the software running on the Raspberry Pi and let the AI drive the track without human intervention.

By training the car on multiple random tracks, the AI learns to drive within the lines and not just to simply drive the same formation over and over again. The goal of this project was to train the AI to also avoid obstacles in the way and stop at stop signs, but we were unable to complete our stretch goals due to the COVID-19 pandemic cutting our project short.