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Setup

GTAV

The first thing you need to do is get a version of GTAV that is 1.0.1180.2 or below on your computer. When you are installing it, take note of where it is installed as we will be using that folder a lot. Specifically where the file GTAV.exe is located, we will refer to that as the GTA home folder. Be aware that GTAV is a massive game and will likely take between 4 to 8 hours to download. You can get GTAV on steam and revert it back or get an older version that is not capable of online play from some other less than reputable source. We will also be assuming you have python installed on this computer.

Revert if GTAV obtained on Steam

https://www.dropbox.com/sh/aad4zmca9baph48/AADOTr1dm_t_6HWvawPhpwswa?dl=0
Download the file from the link above. Go to steam and right click on GTA V. Click on properties, local files, browse local files. Copy “GTA5”, “GTAVLauncher”, and “steam_api64.dll” and paste them in the file explorer page that was opened when you clicked on “browse local files”. You should replace the files that already exist there. Then click on the update folder and do the same with the downloaded update file by replacing the existing file in that directory. Then go to the control panel, uninstall a program, and search “social”. You want to uninstall “Rockstar Games Social Club”. Then double click on the social club file you downloaded and install that. As the game loads, in the bottom right corner it should say “Build 372 Online 1.27”. For a more detailed guide and walkthrough, you can watch this video: https://www.youtube.com/watch?v=5UGVxvf3hEU&feature=youtu.be

DeepGTAV

After getting GTAV and making sure it works the next thing you want is DeepGTAV v2. This can be found on the authors GitHub at https://github.com/aitorzip/DeepGTAV. To install it the first thing you want to do is copy the files under bin/Release from DeepGTAV to your GTA home folder. Depending on how legally you obtained your copy of GTAV you can replace your saved game data with the contents of bin/SaveGame. This isn’t necessary but can give you options that you may want later that wouldn’t be available if you just start a new game. Lastly you need to download paths.xml and put it in the GTA home folder. This file can be found in the ReadMe of DeepGTAV or on our own GitHub. Installing DeepGTAV also installs a tool called ScriptHookV which is a common modding tool for many different GTAV mods. DeepGTAV allows changing a lot of variables in game that allow you to work in a much more stable environment. It also creates the framework for a machine learning bot to learn how to drive.

VPilot

The next thing you will need to install is VPilot. The way DeepGTAV works is by connecting to port 8000 and communicating through JSON files. VPilot connects to port 8000 and auto formats your inputs into JSON files and the received data coming back from the game. To install just download VPilot from the authors GitHub at https://github.com/aitorzip/Vpilot. To make sure everything is working to this point, you will want to run the file called “drive” which is a python file. You may need to change its name to “drive.py” depending on how your computer reads python scripts. If the program successfully runs, you will see a command prompt with the message “Successfully connected to DeepGTAV” and your character should be teleported into a random vehicle in a random scenario with

the throttle on nonstop. The important files to look at here are drive, dataset, client, and messages. The last two mainly deal with communicating with port 8000 so I don't recommend changing them. The drive and dataset files though are what you want to mess with to create the self driving algorithm.

LiDAR GTA V

The next thing you will want to install is LiDAR GTA V which can be found at the authors GitHub here https://github.com/UsmanJafri/LiDAR-GTA-V. This program requires ScriptHookV but we already have that installed with DeepGTAV. This follows just like DeepGTA you will want to copy the contents of bin/Release into the GTA home folder. To make sure this works you will hit f6 while in game, there will be a notification in the bottom left corner of the game saying if it was successful. The point cloud created will be saved in the folder "LiDAR GTA V" that is in the GTA home folder. On some computers hitting f6 alone does not work and you need to hit "fn + f6" instead. The lidar configuration file is also in this folder.

OpenIV

At this point you have technically everything you need to create a self driving car, however some things would be much better if you could change a few more things. So now we install OpenIV in order to edit some of GTAV's encrypted game files. It can be downloaded here https://www.gta5-mods.com/tools/openiv. When you run OpenIV you will want to select GTAV and Windows (assuming you are working on a PC) and then enter your GTA home folder. Once there you will want to navigate through this exact route: GTA V > update > update.rpf > common > data > handling.meta to change some in game variables. Handling.meta contains lots of variables for vehicles that you may want to change for various reasons. We in particular changed "fInitialDriveMaxFlatVel" to lower the max speed of our motorcycle. Full information about what each variable does can be found on the gtamods wiki here https://gtamods.com/wiki/Handling.meta. When you first attempt to change a variable here OpenIV will say you don't have the OpenIV.asi mod installation tool. It will offer to install that and just click yes. Once that is installed it will then warn you that you have no mods folder and any changes you make that break the game may not be fixable, would you like to make a mods folder? This is optional but if you want to play the game normally ever then it is definitely recommended to allow OpenIV to create a mods folder.

PyAutoGUI

The last thing you will need to install to work with what we have so far is pyAutoGUI in order to allow python to hit the f6 key. Assuming you have an updated and working pip you can simply run the command "pip install pyautogui" and be good to go. If there are problems installing it, which we had on two of our three computers, the work around we have is to run "python -m pip install pyautogui" for the library.