Instructions for running openpilot and Carla.

Follow the instruction provided to run the comma.ai simulation

Install Drivers and Software

The simulation runs on Ubuntu Platform Ubuntu 18 or above is preferred.
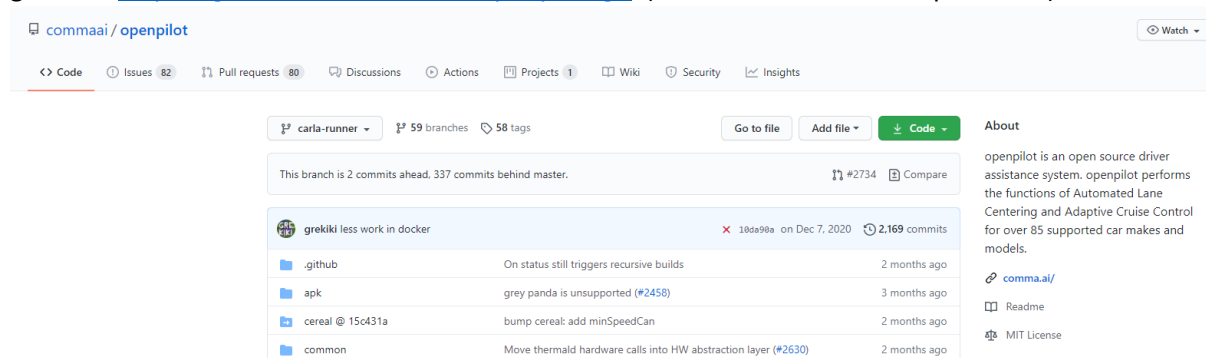
Install Docker

sudo apt install curl

*curl https://get.docker.com | sh *
*&& sudo systemctl start docker *
&& sudo systemctl enable docker

sudo docker run hello-world

Install openpilot and carla

sudo apt install git

git clone https://github.com/commaai/openpilot.git (Carla- runner branch is preferred)

which can be found in this link https://github.com/commaai/openpilot/tree/carla-runner

cd openpilot/tools/sim

./install_carla.sh

Install drivers and start carla

sudo INSTALL=1 ./start_carla.sh

This should start the Carla and show result as shown in figure 1 (for first time Pulling of required files will happen)

The simulation can be performed in two ways

  o   Running the Simulation in Local host of PC with GPU
  o   Running the simulation completely in Docker

The First method is preferred which is will work properly rather than running it in docker.

Running the Simulation in Local host of PC with GPU

For running the simulation on PC the following have to be verified

- The Ubuntu_setup file in 'tools' folder has to be installed
- Compile openpilot by running scons in the openpilot directory
  For video demo: https://youtu.be/i394nQOBS2U

For proper functioning of simulation, CUDA, Cudnn, and onnxruntime-gpu have to be installed

Verify the installations using following commands

- nvidia-smi ~ This shows the GPU and CUDA version
- dpkg -l | grep cudnn ~ This shows Cudnn version
- pip show will show the package version
  eg: pip show onnxruntime-gpu

*If all these are verified then the simulation is will work properly

For running simulation on PC

cd openpilot/tools/sim

sudo ./start_carla.sh

will start the CARLA which will pull required files and run-on Docker (the server can be hosted from the docker or it can be installed locally and configured, here docker is used). This part will be same for both running methods.

Open a new tab in the same terminal

./launch_openpilot.sh

Open the third tab in the same terminal

./bridge.py

The screen on right should appear

In the bridge.py terminal press 1 to engage and increase speed

Press 2 to lower the speed

Press 3 to disengage the openpilot

Video Demo: https://youtu.be/_bZ5OLtvbhk

Running openpilot on Docker

Follow the following commands for running simulation on Docker

cd openpilot/tools/sim

sudo ./start_carla.sh

will start the CARLA which will pull required files and run-on Docker

Open a new tab in the same terminal

sudo ./start_openpilot_docker.sh

will start the Commai.ai simulation. Press 1 in terminal to engage.
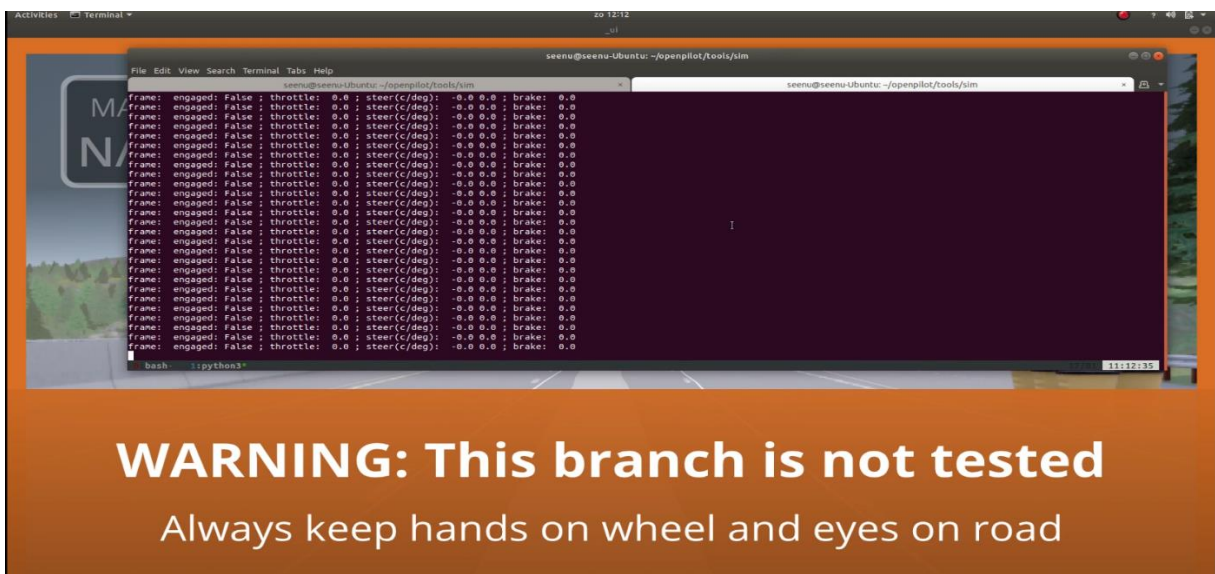
Video Demo + Trouble shooting: https://youtu.be/VuEAiAwoTdY

Tips and Troubleshooting

"communication issue between processes"
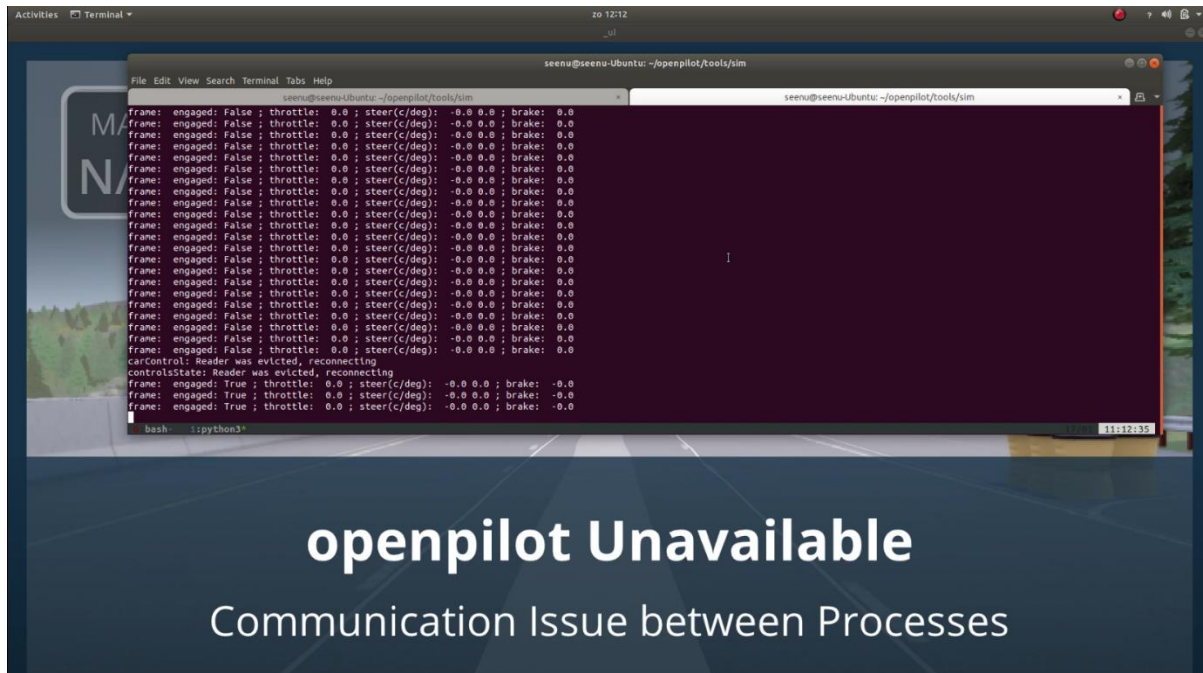
disable the issue in controlsd.py few lines have to be commended out in the docker container

The file access in Docker will be little different

back tick key (`) will be used for navigating the tabs

1) `+0 this command will switch to launch_openpilot.sh tab
   ctrl+c to kill process
   ctrl +z to stop the execution
   ctrl + d to exit the container
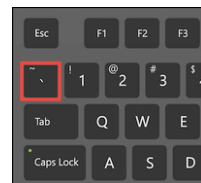
2) `+1 will switch to bridge.py tab
   (q) will quit the process

3) `+c will add new tab (to access controlsd.py)
   cd
   cd /openpilot/selfdrive/controls
   vim controlsd.py   *(this will open the file in vim)*

4) Editing file in vim will be different than other editors type the following command in vim
   shell to comment out the lines
   :201,225s/^/#   press enter – This will comment out line from 201 to 225
   :wq   press enter – this will save the file in vim

5) Navigate back to first tab and execute the *./launch_openpilot.sh* then to second tab and
   execute *./bridge.py*

This will help to remove all the errors like communication error, planner error, and will enable the simulation on Docker. Note: This will not perform the auto pilot properly the car will move and crash. Running the simulation on local machine with GPU will be proper

Carla scene is slow or fails to load in openpilot ui window

Try setting CARLA to the low quality rendering

Open the file openpilot/tools/sim/start_carla.sh in the ubuntu file explorer

on the last line, add ./CarlaUE4.sh -quality-level=Low to the end of the docker command. It should look like the following:

docker run -it --net=host --gpus all carlasim/carla:0.9.7 ./CarlaUE4.sh -quality-level=Low

Docker service error

Every time the docker has to be closed and exited properly, if not it will throw error

Sudo docker ps ~ this will list the running dockers images

Sudo docker kill (id) ~ this will kill the running docker containers

Then restart the services again

Video demo: https://youtu.be/ZilLvPYJ06o