**Final Project – TORCS Simulation**

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**Requirements :** python 3.6.5, tensorflow 1.10.1, TORCS, Cuda 9.0

**Test :**

1. Setting `is training = 0` (my\_config.py)
2. Move checkpoint to directory saved\_network/
3. python testGame.py

**Configuration for Torcs :**

Overall, we followed some instructions from link (<https://yanpanlau.github.io/2016/10/11/Torcs-Keras.html>) which is about Torcs RL with using Keras. In addition, we tried to do our best to get things through by googling when we have problems and implement codes.

First, we just run the Torcs program to check Torcs runs well or not, and it runs well.

Second, we implemented some codes for self-driving. As we need to do actor-critic, we added actor\_network.py (setting with hyper parameters: layer\_size (300 and 400 with batch norm and ReLU), learning rate: 1e-4, Tau=0.001, Batch size=32) and critic\_network.py (setting with hyper parameters: layers\_size (300 and 600 with batch normalization and ReLU), learning rate = 1e-3, Tau = 0.001, L2 (for weight decay) = 0.2).

Third, in driver\_agent.py, we added extra function that is called perceive. perceive function is for storing transition in replay buffer and to replay start size then start training. Also, we set some hyper parameters (replay buffer size with 100000, replay start size with 100, batch size with 32, and Gamma with 0.99).

Fourth, we have made numerous attempts for training by changing hyperparameters in my\_config.py (total\_explore, max\_eps, and max\_steps\_eps).

Lastly, we used the same reward function as the link that we said above, but we thought it does not work well after few training episode, so we changed reward function as follows: .

**Result**

The car did not complete the race properly, and the driver is learned as turning left. So the car is turning as circle.

**Things to improve**

1. Increase Learning time.
2. The Reward function should be further refined.
3. Further more hyperparameter tuning