

```
~/Documents/Carla-0.8.2/candy-master$ CUDA_VISIBLE_DEVICES=1 python3 main.py -m
Town01 -lpygame 1.9.4
Hello from the pygame community. https://www.pygame.org/contribute.html
INFO: listening to server localhost:2000
```

Welcome to CARLA manual control.

Use ARROWS or WASD keys for control.

```
W      : throttle
S      : brake
AD     : steer
Q      : toggle reverse
Space  : hand-brake
P      : toggle autopilot
R      : restart level
1-9    : set reward
n      : disable imitation learning
m      : enable imitation learning(default)
t      : toggle display
c      : toggle model control(Default: model control the car. You may change it into
manual control)
v      : reset now
```

STARTING in a moment...

WARN: gym.spaces.Box autodetected dtype as <class 'numpy.float32'>. Please provide explicit dtype.

WARNING:tensorflow:<tensorflow.python.ops.rnn_cell_impl.BasicLSTMCell object at 0x7f5af2adecc0>: Using a concatenated state is slower and will soon be deprecated. Use state_is_tuple=True.

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WARNING:tensorflow:<tensorflow.python.ops.rnn_cell_impl.BasicLSTMCell object at 0x7f5af2a1ecc0>: Using a concatenated state is slower and will soon be deprecated. Use state_is_tuple=True.

WARNING: <tensorflow.python.ops.rnn_cell_impl.BasicLSTMCell object at 0x7f5af2a1ecc0>: Using a concatenated state is slower and will soon be deprecated. Use state_is_tuple=True.

2018-10-11 11:26:16.018851: I tensorflow/core/platform/cpu_feature_guard.cc:140] Your CPU supports instructions that this TensorFlow binary was not compiled to use: AVX2 AVX512F FMA

```
2018-10-11 11:26:16.286787: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1356]
Found device 0 with properties:
name: GeForce GTX 1080 Ti major: 6 minor: 1 memoryClockRate(GHz): 1.582
pciBusID: 0000:af:00.0
totalMemory: 10.92GiB freeMemory: 10.34GiB
2018-10-11 11:26:16.286834: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1435]
Adding visible gpu devices: 0
2018-10-11 11:26:16.669100: I tensorflow/core/common_runtime/gpu/gpu_device.cc:923]
Device interconnect StreamExecutor with strength 1 edge matrix:
2018-10-11 11:26:16.669147: I tensorflow/core/common_runtime/gpu/gpu_device.cc:929]
0
2018-10-11 11:26:16.669157: I tensorflow/core/common_runtime/gpu/gpu_device.cc:942] 0: N
2018-10-11 11:26:16.669419: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1053]
Created TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 10008 MB
memory) -> physical GPU (device: 0, name: GeForce GTX 1080 Ti, pci bus id: 0000:af:00.0,
compute capability: 6.1)
Restoring!
INFO:tensorflow:Restoring parameters from save/vae
INFO: Restoring parameters from save/vae
INFO:tensorflow:Restoring parameters from save/ppo
INFO: Restoring parameters from save/ppo
INFO:tensorflow:Restoring parameters from save/vae
INFO: Restoring parameters from save/vae
Model Started!
Starting new episode...
Step 1 (0.3 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[1.51671982 3.2798357]][[2.09516501 2.68700743]]
[[1.5167198 3.2798357]]
steer: 3.2697405458748108e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 2 (0.4 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[1.40375674 2.08234406]][[1.3750695 1.98665774]]
[[1.4037567 2.082344 ]]
steer: 3.2697405458748108e-06
throttle: 1.0
```

steer: 1.0
throttle: 1.0

[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[0.6034078 1.94595647]][[0.582208097 1.2062614]]
[[0.6034078 1.9459565]]
steer: 3.2697405458748108e-06
throttle: 1.0

steer: 1.0
throttle: 0.6034078001976013

Step 4 (1.4 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[-0.0212545097 0.400477946]][[0.303287715 0.81081903]]
[[-0.02125451 0.40047795]]
steer: 3.2697405458748108e-06
throttle: 1.0

steer: 0.40047794580459595
brake: 0.021254509687423706

[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[-0.0102407336 1.75020695]][[0.283138156 0.990381181]]
[[-0.01024073 1.750207]]
steer: 3.2697405458748108e-06
throttle: 1.0

steer: 1.0
brake: 0.010240733623504639

[1.0, 3.2697405458748108e-06]
[1.0, 3.2697405458748108e-06]
[[1.08102822 0.942292929]][[0.522859931 1.22507524]]
[[1.0810282 0.9422929]]
steer: 3.2697405458748108e-06
throttle: 1.0

steer: 0.9422929286956787

throttle: 1.0

Step 7 (2.0 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) -0.07 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -8.71930842549773e-06]

[1.0, -8.71930842549773e-06]

[[0.296233654 1.36016214]][[0.883913279 1.58818352]]

[[0.29623365 1.3601621]]

steer: -8.71930842549773e-06

throttle: 1.0

steer: 1.0

throttle: 0.2962336540222168

[1.0, -4.228864418109879e-05]

[1.0, -4.228864418109879e-05]

[[2.09076071 3.14389372]][[1.93151 3.07355404]]

[[2.0907607 3.1438937]]

steer: -4.228864418109879e-05

throttle: 1.0

steer: 1.0

throttle: 1.0

[1.0, -4.185267971479334e-05]

[1.0, -4.185267971479334e-05]

[[3.99833083 5.95468616]][[3.42784142 4.94933844]]

[[3.9983308 5.954686]]

steer: -4.185267971479334e-05

throttle: 1.0

steer: 1.0

throttle: 1.0

Step 10 (2.1 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.01 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -3.2261439628200606e-05]

[1.0, -3.2261439628200606e-05]

[[4.17761803 5.96302176]][[4.21610689 5.79709244]]

[[4.177618 5.9630218]]

steer: -3.2261439628200606e-05

throttle: 1.0

steer: 1.0

throttle: 1.0

[1.0, -2.2670201360597275e-05]
[1.0, -2.2670201360597275e-05]
[[4.65946913 6.02440119]][[4.50995159 6.09913063]]
[[4.659469 6.024401]]
steer: -2.2670201360597275e-05
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.4822823686699849e-05]
[1.0, -1.4822823686699849e-05]
[[5.10832596 5.74227333]][[4.61448145 6.20687628]]
[[5.108326 5.7422733]]
steer: -1.4822823686699849e-05
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 13 (2.1 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -8.71930842549773e-06]
[1.0, -8.71930842549773e-06]
[[4.4574995 6.78563786]][[4.64716482 6.23385239]]
[[4.4574995 6.785638]]
steer: -8.71930842549773e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -5.231584964349167e-06]
[1.0, -5.231584964349167e-06]
[[4.96657944 5.80904722]][[4.66460609 6.24296761]]
[[4.9665794 5.809047]]
steer: -5.231584964349167e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -2.6157924821745837e-06]

[1.0, -2.6157924821745837e-06]
[[5.08582401 6.94944477]][[4.67337275 6.25344276]]
[[5.085824 6.949445]]
steer: -2.6157924821745837e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 16 (2.1 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, -8.719308084437216e-07]
[1.0, -8.719308084437216e-07]
[[5.17094564 6.35754]][[4.6761961 6.24736738]]
[[5.1709456 6.35754]]
steer: -8.719308084437216e-07
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -8.719308084437216e-07]
[1.0, -8.719308084437216e-07]
[[4.58258343 6.68015718]][[4.68126154 6.25794506]]
[[4.5825834 6.680157]]
steer: -8.719308084437216e-07
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -8.719308084437216e-07]
[1.0, -8.719308084437216e-07]
[[4.38111877 6.02585077]][[4.68803549 6.26826525]]
[[4.381119 6.025851]]
steer: -8.719308084437216e-07
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 19 (2.1 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, -1.3078962410872919e-06]
[1.0, -1.3078962410872919e-06]

[[5.3051405 6.53737116]][[4.67883635 6.25759077]]
[[5.3051405 6.537371]]
steer: -1.3078962410872919e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.3078962410872919e-06]
[1.0, -1.3078962410872919e-06]
[[3.66740131 6.13730097]][[4.68130732 6.26036501]]
[[3.6674013 6.137301]]
steer: -1.3078962410872919e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[3.91275573 6.28041935]][[4.69045067 6.2683835]]
[[3.9127557 6.2804193]]
steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 22 (1.9 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0%
other lane, 0% off-road,0.00 reward.[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[4.63585949 6.23193]][[4.68566799 6.26725292]]
[[4.6358595 6.23193]]
steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[4.12504435 6.4995985]][[4.69799709 6.28207207]]
[[4.1250443 6.4995985]]

steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 24 (2.0 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 0.00 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[4.19869471 6.09237242]][[4.69008064 6.27355289]]
[[4.1986947 6.0923724]]
steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[5.11709785 6.93888664]][[4.69069386 6.26822042]]
[[5.117098 6.9388866]]
steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -1.7438616168874432e-06]
[1.0, -1.7438616168874432e-06]
[[4.58397 6.70509243]][[4.69382143 6.2751708]]
[[4.58397 6.7050924]]
steer: -1.7438616168874432e-06
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 27 (2.2 FPS): Map Position (1922.0,1290.0) Lane Orientation (-1.0,-0.0) 2.53 km/h, 0% other lane, 0% off-road,0.05 reward.[1.0, -0.01266305148601532]
[1.0, -0.01266305148601532]
[[4.62098408 6.03141]][[4.727561 6.30946207]]
[[4.620984 6.03141]]
steer: -0.01266305148601532

throttle: 1.0

steer: 1.0

throttle: 1.0

[1.0, -0.06202392652630806]

[1.0, -0.06202392652630806]

[[5.06692648 6.68726778]][[4.7355113 6.31557322]]

[[5.0669265 6.687268]]

steer: -0.06202392652630806

throttle: 1.0

steer: 1.0

throttle: 1.0

Step 29 (1.9 FPS): Map Position (1920.0,1288.0) Lane Orientation (-1.0,-0.0) 9.05 km/h, 0% other lane, 0% off-road,0.18 reward.[1.0, -0.14041399955749512]

[1.0, -0.14041399955749512]

[[4.35222912 5.95815372]][[4.72840452 6.30418396]]

[[4.352229 5.9581537]]

steer: -0.14041399955749512

throttle: 1.0

steer: 1.0

throttle: 1.0

[1.0, -0.24269670248031616]

[1.0, -0.24269670248031616]

[[4.55570602 6.19215775]][[4.73691177 6.32821]]

[[4.555706 6.1921577]]

steer: -0.24269670248031616

throttle: 1.0

steer: 1.0

throttle: 1.0

Step 31 (1.6 FPS): Map Position (1916.0,1285.0) Lane Orientation (-1.0,-0.0) 14.53 km/h, 0% other lane, 0% off-road,0.29 reward.[1.0, -0.5639718174934387]

[1.0, -0.5639718174934387]

[[4.72263241 6.42694473]][[4.73150063 6.32898474]]

[[4.7226324 6.4269447]]

steer: -0.5639718174934387

throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -0.7004106640815735]
[1.0, -0.7004106640815735]
[[5.07999325 5.91254807]][[4.68580723 6.21283]]
[[5.0799932 5.912548]]
steer: -0.7004106640815735
throttle: 1.0

steer: 1.0
throttle: 1.0

[-7.193084363916258, -7.571733228072939, -7.970287314426396, -8.38980284985499,
-8.831388132394434, -9.296204916128831, -9.785486552533573, -10.300517881650622,
-10.84265456413023, -11.413321996209232, -12.014025019124267, -12.646343568947113,
-13.311941565970251, -14.012570237988415, -14.750074435791545, -15.57959521101355,
-16.52433862383365, -17.5845841345787, -18.761325197219847, -20]

Start Memory Replay

[1 1]
[0.03225806 0.03225806 0.03225806 0.03225806 0.03225806 0.03225806
0.03225806 0.03225806 0.03225806 0.03225806 0.03225806 0.03225806
0.03225806 0.03225806 0.03225806 0.03225806 0.03225806 0.03225806
0.03225806 0.03225806]

Memory Extraction Done.

100%  | 30/30

[01:14<00:00, 2.11s/it]

Start Saving

Saving Done.

Memory Replay Done

Step 33 (0.0 FPS): Map Position (1913.0,1280.0) Lane Orientation (-1.0,-0.0) 18.66 km/h, 0%
other lane, 24% off-road,0.13 reward.[1.0, -0.8448577523231506]

[1.0, -0.8448577523231506]
[[4.63926792 5.62644339]][[4.50293207 6.03286457]]
[[4.639268 5.6264434]]
steer: -0.8448577523231506
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -0.8386675119400024]

[1.0, -0.8386675119400024]
[[5.11497927 5.30280733]][[4.56892872 6.0866003]]
[[5.1149793 5.3028073]]
steer: -0.8386675119400024
throttle: 1.0

steer: 1.0
throttle: 1.0

ERROR: (localhost:2002) failed to write data: [Errno 32] Broken pipe
ERROR: (localhost:2000) failed to read data: [Errno 104] Connection reset by peer
Starting new episode...

Step 1 (0.4 FPS): Map Position (660.0,1073.0) Lane Orientation (-0.0,-1.0) 0.00 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -0.0002311706484761089]

[1.0, -0.0002311706484761089]
[[2.2202282 3.18647742]][[1.99185634 3.0229032]]
[[2.2202282 3.1864774]]
steer: -0.0002311706484761089
throttle: 1.0

steer: 1.0
throttle: 1.0

[1.0, -0.0002311706484761089]
[1.0, -0.0002311706484761089]
[[2.3033092 2.6136694]][[1.24114108 2.28174829]]
[[2.3033092 2.6136694]]
steer: -0.0002311706484761089
throttle: 1.0

steer: 1.0
throttle: 1.0

Step 3 (1.6 FPS): Map Position (660.0,1073.0) Lane Orientation (-0.0,-1.0) 0.00 km/h, 0% other lane, 0% off-road,0.00 reward.[1.0, -0.0002311706484761089]

[1.0, -0.0002311706484761089]
[[1.20366406 0.625463903]][[0.376046 1.02964]]
[[1.2036641 0.6254639]]
steer: -0.0002311706484761089
throttle: 1.0

steer: 0.6254639029502869
throttle: 1.0