

环境配置

版本说明

- Win10
- GPU: RTX 3070
- Anaconda3-2021.05+VS Code
- tensorflow2.5.0
- python3.8.10
- cuda11.2.133
- cuDNN8.2.1
- [tensorflow-gpu](#)
- [requirements.txt](#)

```
pip install -r requirements.txt
```

配置步骤

安装cuda和cuDNN

安装cuda

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown. By downloading and using the software, you agree to fully comply with the terms and conditions of the [CUDA EULA](#).

Operating System	<div>Linux</div> <div>Windows</div>
Architecture	<div>x86_64</div>
Version	<div>10</div> <div>Server 2016</div> <div>Server 2019</div>
Installer Type	<div>exe (local)</div> <div>exe (network)</div>

- 选择自定义安装，只勾选cuda选项



安装cuDNN

NVIDIA cuDNN is a GPU-accelerated library of primitives for deep neural networks.

Download cuDNN v8.2.1 [June 7th, 2021], for CUDA 11.x

Library for Windows and Linux, Ubuntu(x86_64, armsbsa, PPC architecture)

[cuDNN Library for Linux \[aarch64sbsa\]](#)

[cuDNN Library for Linux \[x86_64\]](#)

[cuDNN Library for Linux \[PPC\]](#)

[cuDNN Library for Windows \[x86\]](#)

[cuDNN Runtime Library for Ubuntu20.04 x86_64 \[Deb\]](#)

[cuDNN Developer Library for Ubuntu20.04 x86_64 \[Deb\]](#)

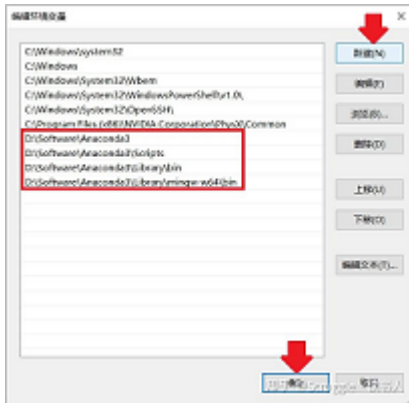
[cuDNN Code Samples and User Guide for Ubuntu20.04 x86_64 \[Deb\]](#)

- 注册账户(满18周岁)并完成问卷调查即可下载对应版本的cuDNN
- 将文件复制到cuda中相对应的文件夹中
- 验证安装

```
C:\Users\Legion>nvcc -V
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2021 NVIDIA Corporation
Built on Mon_May__3_19:41:42_Pacific_Daylight_Time_2021
Cuda compilation tools, release 11.3, V11.3.109
Build cuda_11.3.r11.3/compiler.29920130_0
```

安装anaconda

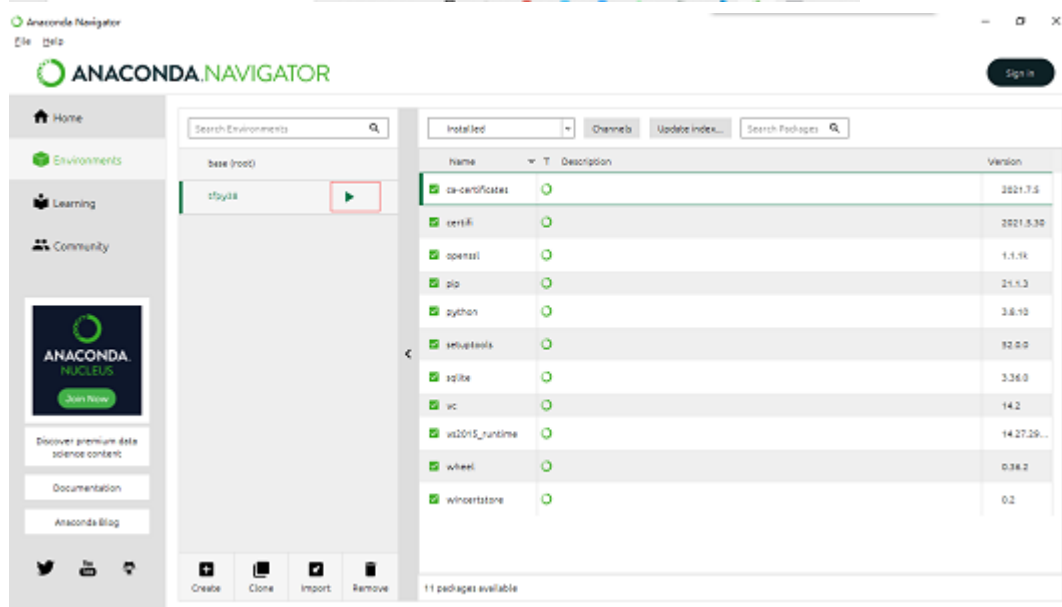
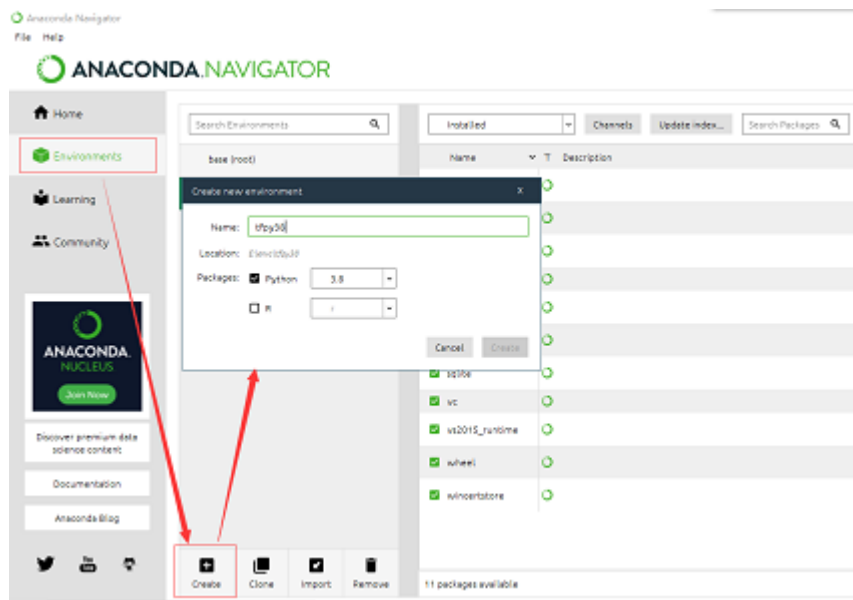
- Anaconda3-2021.05(python3.8)



- 修改Anaconda默认虚拟环境路径

```
conda config --add envs_dirs E:\envs
```

- 配置虚拟环境并进入



C:\Windows\system32\cmd.exe - pip install tensorflow

```
(tfpy38) C:\Users\Legion>pip install --upgrade pip
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Requirement already satisfied: pip in e:\envs\tfpy38\lib\site-packages (21.1.3)

(tfpy38) C:\Users\Legion>pip install tensorflow
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting tensorflow
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/0c/e5/3f2f615bea6fd6ffabcb5978e/tensorflow-2.5.0-cp38-cp38-win_amd64.whl (422.6 MB)
    | 26.0 MB 328 kB/s eta 0:20:09
```

安装tensorflow(默认2.5.0)

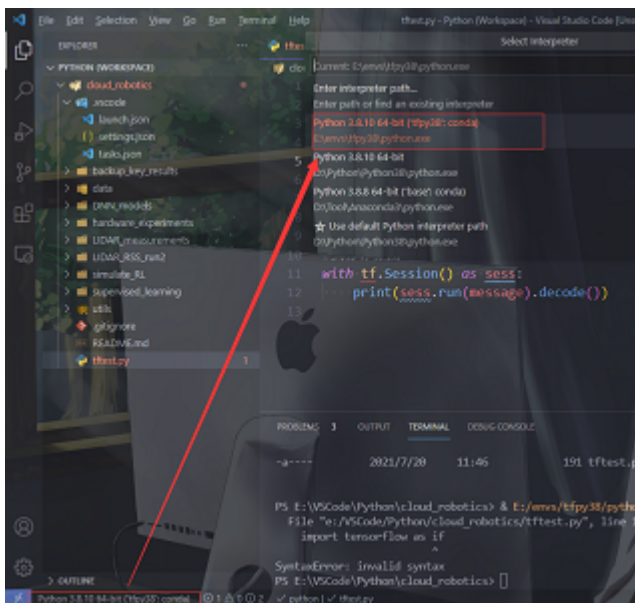
```
pip install --upgrade pip
pip install tensorflow
```

- 验证版本

```
(tfpy38) C:\Users\Legion>python -V & pip -V
Python 3.8.10
pip 21.1.3 from E:\envs\tfpy38\lib\site-packages\pip (python 3.8)
(tfpy38) C:\Users\Legion>python
>>> import tensorflow as tf
>>> tf.__version__
'2.5.0'
```

- TensorFlow找不到`cuda64_110.dll not found`的解决方案 `dlerror: cuda64_110.dll not found`
[cuda64_110.dll](#)
- 如缺少其他`dll`文件可自己下载 下载完之后，需要把改文件解压，然后将`cuda64_110.dll`放在文件夹下
`C:\Windows\System32`
- 一般情况下，出现上述错误是因为没有安装`cuda`和`cuDNN`

VS Code配置Anaconda



- 配置完之后会提示安装`pylint`和`autopep8`,安装即可
- 左下角选择`python`解释器为虚拟环境解释器
- 可能会出现以下问题

```
CommandNotFoundError: Your shell has not been properly configured to use 'conda activate'.
```

- 解决方案

管理员权限打开powershell

```
[  
  
Set-ExecutionPolicy -Scope CurrentUser  
ExecutionPolicy:remotesigned  
  
]
```

- 后面每次打开vs code总会进入bash虚拟环境只需要在 VSCode 的settings.json中加入这一行配置即可：

```
[  
  
"python.terminal.activateEnvironment": false  
  
]
```

- 直接设置Conda取消自动激活base(推荐)打开Powershell

```
[  
  
conda config --set auto_activate_base false  
  
]
```

运行tf hello world例程验证环境配置成功

```
[  
  
import tensorflow as tf  
if tf.test.gpu_device_name():  
    print('Default GPU Device: {}'.format(tf.test.gpu_device_name()))  
else:  
    print("Please install GPU version of TF")  
  
>>>Default GPU Device: /device:GPU:0  
  
]
```

程序执行

运行目的

- 对现有的[模型](#)进行评估并生成评估图

先进入tfpy38虚拟环境

win10下运行linux命令

- 下载git
- 输入sh进入git环境

```
Legion@LAPTOP-G5IM309T MINGW64
/e/VSCode/Python/cloud_robotics/simulate_RL/FaceNet_four_action_simulator
$
```

win10工作地址声明

```
Legion@LAPTOP-G5IM309T MINGW64
/e/VSCode/Python/cloud_robotics/simulate_RL/FaceNet_four_action_simulator
$ export CLOUD_ROOT_DIR='E:/VSCode/Python/cloud_robotics'
```

- 每进一次git，就需要export

修改所有sh脚本文件

- 将python3改为python(win10由于只有一个python版本,因此里面没有python3命令)

运行错误

```
AttributeError: module 'tensorflow' has no attribute 'XXX'
```

- 将所有涉及到py文件中的

```
[  
  
import tensorflow as tf  
  
]
```

替换为

```
[  
  
import tensorflow.compat.v1 as tf  
tf.disable_eager_execution() #关闭eager运算  
tf.disable_v2_behavior()    #禁用TensorFlow 2.x行为  
  
]
```

安装依赖库

安装matplotlib

- pip install matplotlib

安装pandas

- pip install pandas

导入其他文件夹里面的class

- sys.path.append('..')放在最前面

安装gym

- pip install gym

安装seaborn

- pip install seaborn

simulate_RL运行代码

模型训练脚本

- [train_RL.sh](#)用于生成训练模型，可以不执行
- 训练前前确认[训练参数配置](#)


```
[  
  
sh  
cd simulate_RL/FaceNet_four_action_simulator  
sh train_RL.sh  
]
```

- 结果存储文件夹：scratch_results

评估图生成脚本

- 用于对[模型](#)进行评估
- 需要执行该程序生成评估图
- [recreate_submission_plot_RL_agent_pretrained.sh](#)

```
[  
  
    这个脚本是新的，存储路径在backup_key_results里面  
]
```

```
[  
  
sh recreate_submission_plot_RL_agent_pretrained.sh  
]
```

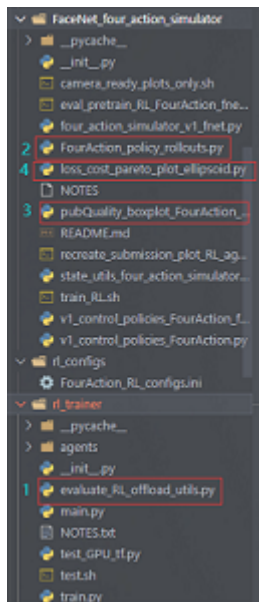
- [eval_pretrain_RL_FourAction_fnet.sh](#)

```
[  
  
    这个脚本是旧的，存储路径在scratch_results里面，和模型训练程序的输出路径在同一个目录下  
]
```

```
[  
  
sh eval_pretrain_RL_FourAction_fnet.sh  
]
```

- 结果存储文件夹：backup_key_results

运行内容



1.EVALUATE A PRE-TRAINED RL AGENT on the new test traces and log the results

- [evaluate_RL_offload_utils.py](#)

```
python evaluate_RL_offload_utils.py
```

- 结果保存到[RL_results_df.csv](#)

2.run the baselines

- [FourAction_policy_rollouts.py](#)

```
python FourAction_policy_rollouts.py
```

- 结果保存到[FourAction_FaceNet_baseline_data_facenet_4action](#)

3.plot a boxplot of all different controllers

- [pubQuality_boxplot_FourAction_env.py](#)

```
python pubQuality_boxplot_FourAction_env.py
```

- 结果保存到[boxplot_facenet_4action](#)

4.plot a pareto optimal covariance plot shown in paper

- [loss_cost_pareto_plot_ellipsoid.py](#)

```
[  
  
python loss_cost_pareto_plot_ellipsoid.py  
  
]
```

- 结果保存到[ELLIPSE_facenet_4action](#)

运行参数

- 这个程序一共五个控制器，每个控制器有7个测试值，每个控制器要训练20次，每次五个控制器轮回测试，每个控制器每个数值每测试一次平均5s，一共 $5 \times 7 \times 20 \times 5 = 3500s$ ，大约跑一次程序要耗费一小时
TRAIN_QUERY_LIST="0.10,0.20,0.50,0.70,1.0"
- this is for the test traces

```
[  
  
QUERY_LIST="0.05,0.15,0.30,0.45,0.80,0.9,0.95"  
#QUERY_LIST="0.10"  
  
]
```

- seeds for the stochastic traces to test on

```
[  
  
TEST_SEEDS="10,20,30,40,50,60,70,80,90,100,110,120,130,140,150,160,170,180,190,200"  
# uncomment for smaller tests  
#TEST_SEEDS="10,20,30,40,50"  
#TEST_SEEDS="10"  
  
]
```

路径错误

- 路径字符串中不能出现'/'
- 删除 `recreate_submission_plot_RL_agent_pretrained.sh` 中多余的 '/'
- 修改 [textfile_utils.py](#) 中的 `remove_and_create_dir(path)` 函数

坐标修改(Heuristic Oracle)

- [loss_cost_pareto_plot_ellipsoid.py](#)

```
[
# ['Unnamed: 0', 'accuracy_cost_mean', 'accuracy_cost_sum', 'controller_name', 'episode',
'query_cost_mean', 'query_cost_sum', 'reward_mean', 'reward_sum']
    reward_mean_latex = r'Episode Reward'
    query_cost_mean_latex = r'Offloading Cost'
    accuracy_cost_mean_latex = r'Classification Loss'
]
```

```
[
# map the simple names in the dataframe to LaTeX display names for the policy plots
    remap_name_dict = {}
    remap_name_dict['random'] = r'$\pi_{\mathtt{random}}^{\mathtt{}}$'
    remap_name_dict['past_edge'] = r'$\pi_{\mathtt{offload}}^{\mathtt{past-robot}}$'
    remap_name_dict['curr_edge'] = r'$\pi_{\mathtt{vehicle}}^{\mathtt{}}$'
    remap_name_dict['past_cloud'] = r'$\pi_{\mathtt{offload}}^{\mathtt{past-cloud}}$'
    remap_name_dict['curr_cloud'] = r'$\pi_{\mathtt{edge}}^{\mathtt{}}$'
    remap_name_dict['RL'] = r'$\pi_{\mathtt{RL}}^{\mathtt{}}$'
    remap_name_dict['oracle'] = r'$\pi_{\mathtt{offload}}^{\mathtt{semiOracle1}}$'
    remap_name_dict['pure_oracle'] = r'$\pi_{\mathtt{Oracle}}^{\mathtt{}}$'

    # get the policy name for the threshold heuristic controllers by extracting their
    threshold
    threshold_val_list = []
    for ctrller in controller_names_list:
        if ctrller.startswith('threshold'):
            threshold_val = ctrller.split('-')[1]
            #remap_name_dict[ctrller] = r'$\pi_{\mathtt{offload}}^{\mathtt{thresh-' +
str(threshold_val) + '}}$'
            remap_name_dict[ctrller] = r'$\pi_{\mathtt{heuristic}}^{\mathtt{}}$'
            threshold_val_list.append(threshold_val)
]
```

```
[
...
ax.text(0.5, 0.25, 'All-Robot', fontsize=15)
ax.text(1.6, 0.3, 'Random', fontsize=15)
ax.text(1.6, 0.15, 'Heuristic', fontsize=15)
ax.text(2.5, 0.05, 'All-Cloud', fontsize=15)
ax.text(0.6, 0.05, 'RL', fontsize=15)

#ax.text(0.75, 0.1, 'Oracle', fontsize=15)
...
]
```

- pubQuality_boxplot_FourAction_env.py

```
# ['Unnamed: 0', 'accuracy_cost_mean', 'accuracy_cost_sum', 'controller_name', 'episode',
'query_cost_mean', 'query_cost_sum', 'reward_mean', 'reward_sum']
```

```
reward_mean_latex = r'Episode Reward'
query_cost_mean_latex = r'Model Query Cost'
accuracy_cost_mean_latex = r'Classification Loss'
```

```
# map the simple names in the dataframe to LaTeX display names for the policy plots
remap_name_dict = {}
remap_name_dict['random'] = r'\pi_{\mathtt{random}}^{\mathtt{}}$'
remap_name_dict['past_edge'] = r'\pi_{\mathtt{offload}}^{\mathtt{past-robot}}$'
remap_name_dict['curr_edge'] = r'\pi_{\mathtt{vehicle}}^{\mathtt{}}$'
remap_name_dict['past_cloud'] = r'\pi_{\mathtt{offload}}^{\mathtt{past-cloud}}$'
remap_name_dict['curr_cloud'] = r'\pi_{\mathtt{edge}}^{\mathtt{}}$'
remap_name_dict['RL'] = r'\pi_{\mathtt{RL}}^{\mathtt{}}$'
remap_name_dict['oracle'] = r'\pi_{\mathtt{offload}}^{\mathtt{semiOracle1}}$'
remap_name_dict['pure_oracle'] = r'\pi_{\mathtt{Oracle}}^{\mathtt{}}$'

# get the policy name for the threshold heuristic controllers by extracting their
threshold
threshold_val_list = []
for ctrller in controller_names_list:
    if ctrller.startswith('threshold'):
        threshold_val = ctrller.split('-')[1]
        #remap_name_dict[ctrller] = r'\pi_{\mathtt{offload}}^{\mathtt{thresh-' +
str(threshold_val) + '}}$'
        remap_name_dict[ctrller] = r'\pi_{\mathtt{heuristic}}^{\mathtt{}}$'
        threshold_val_list.append(threshold_val)
```

运行结果

- **begin**

```
$ sh recreate_submission_plot_RL_agent_pretrained.sh
E:\VSCode\Python\cloud_robotics\DNN_models\RL_checkpoints\facenet_4action\model\
2021-07-21 12:50:53.777001: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cudart64_110.dll
WARNING:tensorflow:From E:\envs\tfpy38\lib\site-
packages\tensorflow\python\compat\v2_compat.py:96: disable_resource_variables (from
tensorflow.python.ops.variable_scope) is deprecated and
will be removed in a future version.
Instructions for updating:
non-resource variables are not supported in the long term
EVALUATING A TRAINED RL AGENT
ENV NAME: FourAction
test_seeds: [10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170,
180, 190, 200]
query_budget_fraction_list: [0.05, 0.15, 0.3, 0.45, 0.8, 0.9, 0.95]
loading model from:
E:\VSCode\Python\cloud_robotics\DNN_models\RL_checkpoints\facenet_4action\model\ logging:
E:\VSCode\Python\cloud_robotics\backup_key_results
num_actions: 4
2021-07-21 12:50:56.164091: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library nvcuda.dll
2021-07-21 12:50:56.189240: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1733] Found
device 0 with properties:
pciBusID: 0000:01:00.0 name: NVIDIA GeForce RTX 3070 Laptop GPU computeCapability: 8.6
coreClock: 1.56GHz coreCount: 40 deviceMemorySize: 8.00GiB deviceMemoryBandwidth:
417.29GiB/s
2021-07-21 12:50:56.189574: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cudart64_110.dll
2021-07-21 12:50:56.204681: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cublas64_11.dll
2021-07-21 12:50:56.204857: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cublasLt64_11.dll
2021-07-21 12:50:56.208312: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cufft64_10.dll
2021-07-21 12:50:56.209741: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library curand64_10.dll
2021-07-21 12:50:56.212657: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cusolver64_11.dll
2021-07-21 12:50:56.215902: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cusparse64_11.dll
2021-07-21 12:50:56.216784: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cudnn64_8.dll
2021-07-21 12:50:56.216989: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1871] Adding
visible gpu devices: 0
2021-07-21 12:50:56.217453: I tensorflow/core/platform/cpu_feature_guard.cc:142] This
TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the
following CPU instructions in performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2021-07-21 12:50:56.218258: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1733] Found
device 0 with properties:
pciBusID: 0000:01:00.0 name: NVIDIA GeForce RTX 3070 Laptop GPU computeCapability: 8.6
```

```

coreClock: 1.56GHz coreCount: 40 deviceMemorySize: 8.00GiB deviceMemoryBandwidth:
417.29GiB/s
2021-07-21 12:50:56.218562: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1871] Adding
visible gpu devices: 0
2021-07-21 12:50:56.607564: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1258] Device
interconnect StreamExecutor with strength 1 edge matrix:
2021-07-21 12:50:56.607884: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1264]      0
2021-07-21 12:50:56.608029: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1277] 0:    N
2021-07-21 12:50:56.608300: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1418]
Created TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 5484 MB
memory) -> physical GPU (device: 0, name: NVIDIA GeForce RTX 3070 Laptop GPU, pci bus id:
0000:01:00.0, compute
capability: 8.6)
A2C, self.n_a: 4
A2C, self.n_s: 13
WARNING:tensorflow:From E:\envs\tfpy38\lib\site-
packages\tensorflow\python\util\dispatch.py:206: multinomial (from
tensorflow.python.ops.random_ops) is deprecated and will be removed in a
future version.
Instructions for updating:
Use `tf.random.categorical` instead.
checkpoint loaded: checkpoint-380520
#####
start RL: seed 10 , budget: 0.05
FACENET 4 action reset seed: 10
fixed query budget: 0.05
2021-07-21 12:50:57.043027: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cublas64_11.dll
2021-07-21 12:50:57.657992: I tensorflow/stream_executor/platform/default/dso_loader.cc:53]
Successfully opened dynamic library cublasLt64_11.dll
2021-07-21 12:50:57.658270: I tensorflow/stream_executor/cuda/cuda_blas.cc:1838]
TensorFloat-32 will be used for the matrix multiplication. This will only be logged once.
FourActionSimulator-FACENET seed 10 Controller: RL

```

- **mid**(仅展示0.95+200组合的输出信息)


```
[  
  
FACENET 4 action reset seed: 200  
fixed query budget: 0.95  
FourActionSimulator-FACENET seed 200 Controller: curr_edge  
episode mean/median reward: -2.132 -1.0  
action_diversity: [80.0, 0.0, 79.0, 0.0]  
num queries remain: 76  
random query budget frac: 0.95
```

```
#####
```

```
END EPISODE FourActionV1 all-edge:  
done action: 0 2 , flag : True  
time: 80  
mean reward: -2.132  
#####
```

```
FACENET 4 action reset seed: 200  
fixed query budget: 0.95  
FourActionSimulator-FACENET seed 200 Controller: curr_cloud  
episode mean/median reward: -2.525 -1.0  
action_diversity: [4.0, 76.0, 4.0, 76.0]  
num queries remain: 0  
random query budget frac: 0.95
```

```
#####
```

```
END EPISODE FourActionV1 all-cloud  
done action: 1 3 , flag : True  
time: 80  
mean reward: -2.525  
#####
```

```
FACENET 4 action reset seed: 200  
fixed query budget: 0.95  
FourActionSimulator-FACENET seed 200 Controller: random  
episode mean/median reward: -3.163 -1.0  
action_diversity: [42.0, 38.0, 27.0, 28.0]  
num queries remain: 48  
random query budget frac: 0.95
```

```
#####
```

```
END EPISODE FourActionV1 random  
time: 80  
mean reward: -3.163
```

- ```
]

• end
```

SUMMARY REWARDS STATS

controller\_name

curr\_cloud -368.0

curr\_edge -349.0

pure\_oracle -62.0

random -454.5

threshold-0.5 -379.0

Name: reward\_sum, dtype: float64

attempting to delete

E:\VSCode\Python\cloud\_robotics\backup\_key\_results\boxplot\_facenet\_4action path

E:\VSCode\Python\cloud\_robotics\backup\_key\_results\boxplot\_facenet\_4action\

子目录或文件 -p 已经存在。

处理: -p 时出错。

SUMMARY REWARDS STATS

controller\_name

RL -105.0

curr\_cloud -368.0

curr\_edge -349.0

pure\_oracle -62.0

random -454.5

threshold-0.5 -379.0

Name: reward\_sum, dtype: float64

E:\VSCode\Python\cloud\_robotics\simulate\_RL\FaceNet\_four\_action\_simulator\pubQuality\_boxplot\_FourAction\_env.py:87: RuntimeWarning: divide by zero encountered in double\_scalars

fold = RL\_value/value

best\_threshold\_controller threshold-0.5

best\_threshold\_reward -379.0

{'random': '\$\pi\_{\text{random}}^{\text{}}\$', 'past\_edge':

'\$\pi\_{\text{offload}}^{\text{past-robot}}\$', 'curr\_edge':

'\$\pi\_{\text{vehicle}}^{\text{}}\$', 'past\_cloud':

'\$\pi\_{\text{offload}}^{\text{past-cloud}}\$', 'curr\_cloud':

'\$\pi\_{\text{edge}}^{\text{}}\$', 'RL': '\$\pi\_{\text{RL}}^{\text{}}\$',

'oracle': '\$\pi\_{\text{offload}}^{\text{semiOracle1}}\$', 'pure\_oracle':

'\$\pi\_{\text{Oracle}}^{\text{}}\$', 'threshold-0.5':

'\$\pi\_{\text{heuristic}}^{\text{}}\$'

findfont: Font family ['normal'] not found. Falling back to DejaVu Sans.

findfont: Font family ['normal'] not found. Falling back to DejaVu Sans.

attempting to delete

E:\VSCode\Python\cloud\_robotics\backup\_key\_results\ELLIPSE\_facenet\_4action path

E:\VSCode\Python\cloud\_robotics\backup\_key\_results\ELLIPSE\_facenet\_4action\

子目录或文件 -p 已经存在。

处理: -p 时出错。

SUMMARY REWARDS STATS

controller\_name

RL -105.0

curr\_cloud -368.0

curr\_edge -349.0

pure\_oracle -62.0

random -454.5

threshold-0.5 -379.0

Name: reward\_sum, dtype: float64

```

best_threshold_controller threshold-0.5
best_threshold_reward -379.0
{'random': '$\pi_{\mathtt{random}}^{\mathtt{}}$', 'past_edge':
'$\pi_{\mathtt{offload}}^{\mathtt{past-robot}}$', 'curr_edge':
'$\pi_{\mathtt{vehicle}}^{\mathtt{}}$', 'past_cloud':
'$\pi_{\mathtt{offload}}^{\mathtt{past-cloud}}$', 'curr_cloud':
'$\pi_{\mathtt{edge}}^{\mathtt{}}$', 'RL': '$\pi_{\mathtt{RL}}^{\mathtt{}}$',
'oracle': '$\pi_{\mathtt{offload}}^{\mathtt{semiOracle1}}$', 'pure_oracle':
'$\pi_{\mathtt{Oracle}}^{\mathtt{}}$', 'threshold-0.5':
'$\pi_{\mathtt{heuristic}}^{\mathtt{}}$'}

```

```

controller_name: $\pi_{\mathtt{random}}^{\mathtt{}}$
0.9913336378440708 0.2593531372059625

```

```
0.2672069924781818
```

```

controller_name: $\pi_{\mathtt{vehicle}}^{\mathtt{}}$
0.5 0.1889240506329114

```

```
0.0
```

```

controller_name: $\pi_{\mathtt{edge}}^{\mathtt{}}$
1.4855652339168526 0.12842159428086955

```

```
0.7947975824843596
```

```

controller_name: $\pi_{\mathtt{heuristic}}^{\mathtt{}}$
1.0234322777255604 0.11723243719609755

```

```
0.25472645568840746
```

```

controller_name: $\pi_{\mathtt{RL}}^{\mathtt{}}$
0.6726049838593614 0.03980394274467847

```

```
0.08645277764224792
```

```

controller_name: $\pi_{\mathtt{Oracle}}^{\mathtt{}}$
0.5753549141837466 0.009415343060301043

```

```
0.12689548737544387
```

No handles with labels found to put in legend.

findfont: Font family ['normal'] not found. Falling back to DejaVu Sans.

findfont: Font family ['normal'] not found. Falling back to DejaVu Sans.

## 存在问题

### 处理-p文件错误

[

```
attempting to delete
E:\VSCode\Python\cloud_robotics\backup_key_results\boxplot_facenet_4action path
E:\VSCode\Python\cloud_robotics\backup_key_results\boxplot_facenet_4action\
子目录或文件 -p 已经存在。
处理: -p 时出错。
```

```
attempting to delete
E:\VSCode\Python\cloud_robotics\backup_key_results\ELLIPSE_facenet_4action path
E:\VSCode\Python\cloud_robotics\backup_key_results\ELLIPSE_facenet_4action\
子目录或文件 -p 已经存在。
处理: -p 时出错。
```

]

- 解决方法 · 修改[textfile\\_utils.py](#)

[

```
def remove_and_create_dir(path):
 """ System call to rm -rf and then re-create a dir """

 dir = os.path.dirname(path)
 print('attempting to delete ', dir, ' path ', path)
 if os.path.exists(path):
 os.system("rm -rf " + path)
 os.system("mkdir -p " + path)
```

]

修改为

[

```
import string
...
def remove_and_create_dir(path):
 """ System call to rm -rf and then re-create a dir """

 dir = os.path.dirname(path)
 print('attempting to delete ', dir, ' path ', path)
 if os.path.exists(path):
 print('dir or file had exit,remove and recreate')
 os.system("rd/s/q " + path.replace('/', '\\'))#Win10
 #os.system("rm -rf" + path)#linux
 #os.system("mkdir -p " + path)#linux
 print('create dir')
 os.system("mkdir " + path.replace('/', '\\'))#Win10
```

]

- 该问题已成功解决

## Warning

- 版本较低所产生的警告信息，即第三方库版本高于代码版本，对结果没有影响

```
[

WARNING:tensorflow:From E:\envs\tfpy38\lib\site-
packages\tensorflow\python\compat\v2_compat.py:96: disable_resource_variables (from
tensorflow.python.ops.variable_scope) is deprecated and will be removed in a future
version.

non-resource variables are not supported in the long term

WARNING:tensorflow:From E:\envs\tfpy38\lib\site-
packages\tensorflow\python\util\dispatch.py:206: multinomial
(from tensorflow.python.ops.random_ops) is deprecated and will be removed in a future
version.

MatplotlibDeprecationWarning: Support for setting the 'text.latex.preamble' or
'pgf.preamble' rcParam to a list of strings is deprecated since 3.3 and will be removed two
minor releases later; set it to a single string instead.
plt.rcParams['text.latex.preamble'] = [r'\boldmath']

MatplotlibDeprecationWarning: Support for setting the 'text.latex.preamble' or
'pgf.preamble' rcParam to a list of strings is deprecated since 3.3 and will be removed two
minor releases later; set it to a single string instead.
plt.rcParams['text.latex.preamble'] = [r'\boldmath']

MatplotlibDeprecationWarning: Support for setting the 'text.latex.preamble' or
'pgf.preamble' rcParam to a list of strings is deprecated since 3.3 and will be removed two
minor releases later; set it to a single string instead.
plt.rcParams['text.latex.preamble'] = [r'\boldmath']
]
```

- 除数为0->pubQuality\_boxplot\_FourAction\_env.py第87行(未解决)

```
[

RuntimeWarning: divide by zero encountered in double_scalars
]
```

- 找不到标签->plotting\_utils.py(未解决)

```
[

No handles with labels found to put in legend
]
```

第一种：plt.scatter()没写label项

plt.legend()就是为了展示标签，前面函数中没有定义，自然无法显示

解决方法：plt.scatter() 中加入 label = "XX"

第二种：plt.plot(),plt.figure()顺序错误

解决方案：我们将plt.figure()放到plt.plot()后面，也就是先加入label，然后再使用显示，这样就可以得到我们想输出的标签

- matlab库字体缺失(未解决)

```
findfont: Font family ['normal'] not found. Falling back to DejaVu Sans
```

- 长期不支持非资源变量(未解决)

```
non-resource variables are not supported in the long term
```

## 效果评估图

|                                        |                 |                     |           |
|----------------------------------------|-----------------|---------------------|-----------|
| boxplot_facenet_4action                | 2021/7/20 19:49 | 文件夹                 | 新图        |
| ELLIPSE_facenet_4action                | 2021/7/20 19:50 | 文件夹                 |           |
| FourAction_FaceNet_baseline_data_fa... | 2021/7/20 19:49 | 文件夹                 |           |
| RL_data_facenet_4action_run3_newcost   | 2021/7/5 13:15  | 文件夹                 | 旧图        |
| RL_data_facenet_4action_run3_newco...  | 2021/7/5 13:15  | 文件夹                 |           |
| RL_results_df.csv                      | 2021/7/20 19:22 | Microsoft Excel ... | 26,391 KB |
| summary.txt                            | 2019/5/21 2:38  | 文本文档                | 2 KB      |

- 箱线图
- 帕雷托图