

This is the code about using AssistPG on Reinforcement Learning scenario. To run the code, you need to use conda to install some packages, including:

```
conda install -c conda-forge gym
conda install -c conda-forge gym-recording
conda install -c pytorch pytorch
conda install -c conda-forge box2d-py
conda install -c conda-forge ffmpeg
conda install -c conda-forge pygame
conda install tensorboard
conda install -c conda-forge asciinema
conda install -c conda-forge gym=0.17.3 (If the video cannot be played, try this package)
```

To run the code, please first paste lunar_landerV2.py to package gym/envs/box2d/, and paste cartpoleV2.py to package gym/envs/classic_control/.

There are some arguments in the code.

- device: whether you will use GPU or CPU, default is CPU
- env_run: the environment that we will choose: 'lunarlander', 'cartpole'
- play_mode: the method that we will choose to play: 'single' means Learner-PG, 'oracle' means PG, 'fl' means FedAvg, 'assist' means AssistPG.
- iteration: setting seed for the running.
- hid_size: the hidden size in the neural network.
- epoch: the running epochs for 'single' and 'oracle'
- episode: how many episode will be run in each epoch
- setting: in which setting will the problem play, default is 1. You can add more settings by yourself, and play it.
- fl_epoch: how many epochs each agent will run in each round in FedAvg Algorithm.
- fl_round: how many rounds of the FedAvg algorithm
- assist_epoch: how many epochs will be run in each agent in each round.
- assist_round: how many rounds of assistance will be run

Please use the following sample codes in your terminal to run the LunarLander environment and the CartPole environment.

```
python3 assistPG.py --device='cuda' --assist_round=5 --setting=1 --fl_round=5 --
fl_epoch=10 --assist_epoch=10 --episode=32 --epoch=100 --hid_size=32 --iteration=1 --
env_run='lunarlander' --play_mode='single'
```

```
python3 assistPG.py --device='cuda' --assist_round=5 --setting=1 --fl_round=5 --
fl_epoch=10 --assist_epoch=10 --episode=32 --epoch=100 --hid_size=4 --iteration=1 --
env_run='cartpole' --play_mode='single'
```

The result will be printed during running, you can also open from the saved result.