



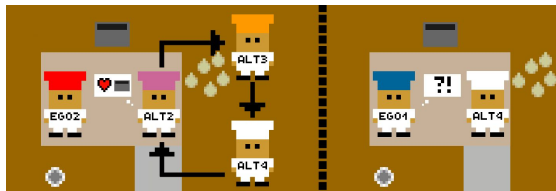
PantheonRL: A MARL Library for Dynamic Training Interactions

Bidipta Sarkar, Aditi Talati, Andy Shih, Dorsa Sadigh



Overview

Supports Complex Training Interactions with existing single-agent RL algorithms



Round-Robin

Cross-Play

Agent Design

Ego: Works with **any** gym-based RL algorithm

Partner: Any Stable-Baselines3 algorithm

OnPolicyAgent PPO A2C

OffPolicyAgent DQN SAC ...

StaticPolicyAgent ActorCriticPolicy

Can create custom partners with hard-coded `get_action` and `update`

Web Interface

Allows for asynchronous training and monitoring

Partner Agent 2 (Optional)

You have successfully set 1 partner agent(s).
Filling out this form again will add an additional partner.

Pick a type of agent:

PPO

Select

PPO Parameters

Seed for randomness (optional):

23

Save as: (if left blank, the trained ego policy will not be saved)

partnerb

Save Partner Agent

PantheonRL

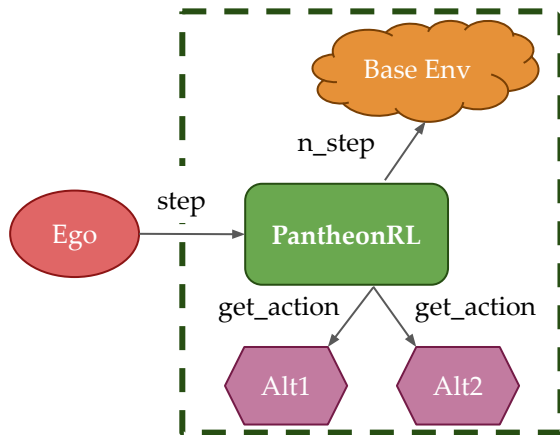
Current Training Data:

rolloutep,tes_mean	400.0
rolloutep,tes_max	0.0
time/ep	268.0
train/eprox,kl	0.010521722862301075
train/ep,fractio	0.08803316471888188
train/ep,range	0.20000000000000002
train/ep,loss	-1.761912949843425
train/ep,loss/ent	-0.07175168536202309
train/ep,loss/ent	0.0010000000000000004
train/ep,loss	-0.04108450803070003
train/ep,gradient,loss	-0.01388407368470175
train/ep,loss	0.01738488878143007

Check for Updates

Create Tensorboard

PantheonRL Framework



Example Scripts

Round-Robin Training

```

env = gym.make('OvercookedMultiEnv-v0', layout_name='simple')
partner_1 = PPO.load(partner_1_file)
env.add_partner_agent(StaticPolicyAgent(partner_1))
partner_2 = A2C('MlpPolicy', env)
env.add_partner_agent(OnPolicyAgent(partner_2))
ego = PPO('MlpPolicy', env, verbose=1)
ego.learn(total_timesteps=10000)

```

Ad-hoc Adaptation

```

env = gym.make('OvercookedMultiEnv-v0', layout_name='simple')
env.add_partner_agent(StaticPolicyAgent(partner_2.policy))
ego_b = PPO.load(ego_b_file, env=env)
ego_b.learn(total_timesteps=500000)

```

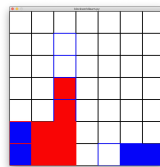
Use Cases

Decentralized MARL Training
Human-AI Interaction
Independent AI Collaboration

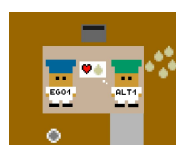


Supported Environments

Block World



Overcooked



PettingZoo

