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import gymnasium as gym
from stable_baselines3 import PPO
from stable_baselines3.common.env_util import make_vec_env
from mani_skill.utils import gym_utils
from mani_skill.utils.wrappers.record import RecordEpisode
from mani_skill.vector.wrappers.sb3 import ManiSkillsB3VectorEnv

# Run 64 environments for parallelized learning!
ms3_vec_env = gym.make("PullCube-v1", num_envs=64, control_mode=
'pd_joint_delta_pos', max_episode_steps=100) #control_mode= 'pd_joint_delta_pos'
max_episode_steps = gym_utils.find_max_episode_steps_value(ms3_vec_env)
vec_env = ManiSkillsB3VectorEnv(ms3_vec_env)

# Define PPO agent and train the model
model = PPO("MlpPolicy", vec_env, gamma=0.8, gae_lambda=0.95, n_steps=50,
batch_size=128,
n_epochs=8, verbose=1)
model.learn(total_timesteps=500_000) # Start learning
model.save("ppo") # Save the model as ppo
vec_env.close()
del model

model = PPO.load("ppo") # Load the saved model

# Visualize the trained agent
eval_vec_env = gym.make("PullCube-v1", num_envs=16, control_mode=
'pd_joint_delta_pos', render_mode="rgb_array") # control_mode= 'pd_joint_delta_pos',
eval_vec_env = RecordEpisode(eval_vec_env, output_dir="Videos/PP03",
save_video=True,
save_trajectory=False,
max_steps_per_video=max_episode_steps)
#eval_vec_env = ManiSkillsB3VectorEnv(eval_vec_env)

# obs = eval_vec_env.reset()

# #Generate actions using the trained expert
# for i in range(max_episode_steps):
#     action, _states = model.predict(obs, deterministic=True)
#     obs, rewards, dones, info = eval_vec_env.step(action)

#evaluating the model
def eval_success_rate(model, eval_env, num_episodes=100):
    success_count = 0

    for episode in range(num_episodes):
        obs = eval_vec_env.reset()[0]
        final=False

        for i in range(max_episode_steps):
            action, _states = model.predict(obs.cpu().numpy(), deterministic=True)
            obs, rewards, dones, _, info = eval_vec_env.step(action)

            #print(f"Info at step {i}: {info}")

            for j in range(len(info)):
                if 'success' in info:

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success_c = info['success'].cpu().numpy()
for k in range(len(success_c)):
    success = success_c[k]
    # print('Success is:', success)
if success:
    final=True
    print(f"Task was successful at step {i}")
    break

if not final:
    print("Task was not successfull",episode)
else:
    print("Task successfull")
    success_count +=1

print(f"Episode {episode + 1} is done at this stage")

print(f"\nSuccess Count: {success_count}/{num_episodes} episodes")
success_rate = (success_count / num_episodes) * 100
print(f"Success Rate: {success_rate}%")

eval_success_rate(model, eval_vec_env, num_episodes=100)
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