

REPORT

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Problem 1.1

PullCube-v1: A simple task where the objective is to pull a cube onto a target.

Here the blue cube is placed on the table and the target is near the cube. The task is to pull the cube towards the target.

Initially, using VLM model, the description about the task was generated by giving the appropriate prompt.

Then, we trained the model using PPO and saved the python code as PPO.py. Once the model is trained, evaluation has been performed to see the success rate which is 27% given below.

Once the evaluation and training are done, the VLM model process the final scene of the task to check if the task is completed or not. And gives the description whether it is done or not based on the given prompt.

Things needed to perform is that

- Get the description about the pullcube task using VLM model
- Evaluate the success rate by training the model with PPO
- Get the description of the final stage of the task to check if the task is completed or not.

Problem 1.2:

In this image, the task was successful as say at episode 32, where the success video will be attached in there as success.mp4. And image depicts the success at episode 32.

(Success rate is next image)

```
Task was successful at step 81
Task was successful at step 82
Task was successful at step 83
Task was successful at step 84
Task was successful at step 85
Task was successful at step 86
Task was successful at step 87
Task was successful at step 88
Task was successful at step 89
Task was successful at step 90
Task was successful at step 91
Task was successful at step 92
Task was successful at step 93
Task was successful at step 94
Task was successful at step 95
Task was successful at step 96
Task was successful at step 97
Task was successful at step 98
Task was successful at step 99
Task successfull
Episode 32 is done at this stage
```

Hence, the **success rate** will be :

```
Episode 96 is done at this stage
Task was not successfull 96
Episode 97 is done at this stage
Task was not successfull 97
Episode 98 is done at this stage
Task was not successfull 98
Episode 99 is done at this stage
Task was not successfull 99
Episode 100 is done at this stage

Success Count: 27/100 episodes
Success Rate: 27.0%
```

Image description: The image depicts a robotic arm, specifically a robotic arm of a manufacturing robot, performing a task on a wooden table, where it is carefully placing a small cube on a target, which is marked with a bullseye symbol, indicating that the task is to accurately place the cube on the target, as evidenced by the robotic arm's precise movements and the cube's position on the target.

Problem 2.2:

Prompt:

```
# Generate description
description = model.answer_question(
    image,
    "The task is to pull the blue cube towards the target placed on the table by the robot. Check the image and see if the task is completed or not in detail.",
    tokenizer,
    do_sample=True, temperature=0.3
)
print("Image description:", description)
```

✓ 1m 49.8s Python

Since I ran the code in Jupyter notebook as .ipynb file. The output is elongated and unable to take the screenshot. Hence, the two pictures of description. Below has the text output.

Description:

```
/home/yka2dk/.conda/envs/maniskill env/lib/python3.9/site-packages/gymnasium/core.py:311: UserWarning: WARN: env.max_episode_steps to get variables from other wrappers is deprecated and
  logger.warn(
Loading checkpoint shards: 100%|██████████| 4/4 [01:18<00:00, 19.56s/it]
Starting from v4.46, the `logits` model output will have the same type as the model (except at train time, where it will always be FP32)
Image description: Based on the image, I can see that the robot is attempting to pull the blue cube towards the target placed on the table. However, the cube is not yet aligned with the

To determine if the task is completed, I would need to see if the blue cube is now aligned with the target and is in close proximity to it. If the cube is still not aligned with the targ

e.py:311: UserWarning: WARN: env.max_episode_steps to get variables from other wrappers is deprecated and will be removed in v1.0, to get this variable you can do `env.unwrapped.max_episo

del (except at train time, where it will always be FP32)
pull the blue cube towards the target placed on the table. However, the cube is not yet aligned with the target, and it appears that the robot is still in the process of moving the cube.

ow aligned with the target and is in close proximity to it. If the cube is still not aligned with the target, then the task is not yet completed.
```

Text editor version:

