NVIDIA Issac Gym Installation Guide for Ubuntu
(through Anaconda)

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1   Prerequisites

- Ubuntu 18.04 or 20.04

    - **Note: Ubuntu 22.04 does not work!! Tested**

- Python 3.6, 3.7 or 3.8

- Anaconda 3

- Minimum NVIDIA driver version: 470

    - For more details about how to check and install the correct version NIVIDIA on Ubuntu, see appendix

2   Download and Unzip Issac Gym Package

Go to https://developer.nvidia.com/isaac-gym.

If you have not registered an account for NVIDIA Developer or not logged in, you should see a **Join Now** button right in the center of the page. Click on that, then it should direct you to an account-setting page. Follow the instructions to sign up or sign in with NVIDIA Developer .

After logging in, instead of **Join Now**, there should be a **Member Area** button. Click on that to enter the installation page. Then, click on **Issac Gym - Ubuntu Linux 18.04/20.04 Preview 4 release** to start download.

When the download finishes, you should see the file in the folder `Downloads` by default:

    /home/{user_name}/Downloads/IsaacGym_Preview_4_Package.tar.gz

Unzip the file:

    $ tar -xf IsaacGym_Preview_4_Package.tar.gz

Now you should see a folder named `issacgym` in the current directory. This folder is the root directory of the Issac Gym simulator, you can move it to anywhere in your workspace.

3   Create Conda Virtual Environment

In the root directory `issacgym`, run the following command to start to build the conda environment:

```
$ ./create_conda_env_rlgpu.sh
```

In practice, the building process can take up to an hour to finish, so be patient and wait.

Troubleshooting:

- `CondaError:  Downloaded bytes did not match Content-Length...` Most likely this is because `conda` is not updated to the newest version. run:

  ```
  $ conda update conda
  ```

After finishing building the environment, run the following to activate the environment:

```
$ conda activate rlgpu
```

Go to `.../issacgym/python` to install `issacgym` python library:

```
$ pip3 install -e .
```

Check Pytorch can detect GPU:

- Make sure `pytorch` can work well with NVIDIA GPU is important since the simulator relies heavily on GPU performance. To check whether the `pytorch` successfully detect the GPU, run:

  ```
  $ python
  >> import torch
  >> torch.cuda.is_available()
  ```
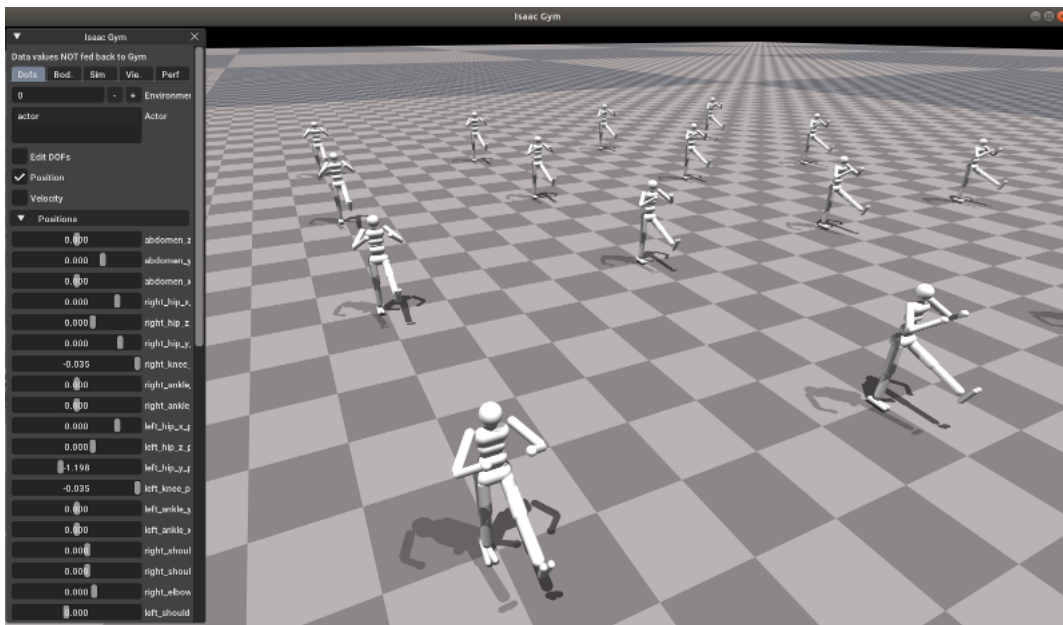
  If it returns `False`, this indicates that there are some problems with NVIDIA driver, see appendix for more details.

4   Run Example and Test

Go to `.../issacgym/python/examples` and run:

```
$ python joint_monkey.py
```

If everything works well, you should see a window like this:

Troubleshooting:

- If you see an error like this:

  ```
  ImportError: libpython3.7m.so.1.0: cannot open shared object file:
  No such file or directory
  ```

  Check the official solution in `.../issacgym/docs/index.html` under the installation section

5 Appendix: Install NVIDIA Driver on Ubuntu

Ubuntu cannot detect and use NIVIDA GPU is a common issue, especially when Ubuntu is installed along with other OS, such as Windows. If NVIDIA driver is not installed properly, the system can only detect the integrated graphic card, therefore `pytorch` cannot use `cuda` in this case.

The most accurate and simplest way to check whether the system is using NVIDIA GPU is to check the CUDA availabiliy from `pytorch`, as mentioned in the end of section 3. If CUDA is not available, then it implies that the system cannot detect a NVIDIA GPU. In this case, you need to properly install a NVIDIA driver, here is one tutorial:
https://www.cyberciti.biz/faq/ubuntu-linux-install-nvidia-driver-latest-proprietary-driver/

To install Issac Gym, the required driver version is above 470. If none of the drivers has a version above 470, most likely your GPU is outdated.

Note: You may find there are many drivers available for your system, and from my experience some may work and some may not. In other words, it is probably necessary to try some of them and see which one works.