PyTorch 安装

📌 NOTE: CPU 和 GPU 环境只能二选一，建议安装 CPU 环境。或者创建两个虚拟环境。

一、虚拟环境搭建

1.1 安装虚拟环境

Bash

```bash
# 建议采用anaconda或者miniconda安装对应的环境，并创建虚拟环境
https://repo.anaconda.com/archive/
https://repo.anaconda.com/miniconda/

# 建议安装3.9、3.11或者3.12的版本
conda create --name gpu_default python=3.12
# 或者
conda create --name cpu_default python=3.12
```

```
(open_manus) PS C:\Users\19410> conda create --name gpu_default python=3.12
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: D:\anaconda3\envs\gpu_default

  added / updated specs:
    - python=3.12


The following NEW packages will be INSTALLED:

  bzip2              anaconda/pkgs/main/win-64::bzip2-1.0.8-h2bbff1b_6 None
  ca-certificates    anaconda/pkgs/main/win-64::ca-certificates-2025.2.25-haa95532_0 None
  expat              anaconda/pkgs/main/win-64::expat-2.6.4-h8ddb27b_0 None
  libffi             anaconda/pkgs/main/win-64::libffi-3.4.4-hd77b12b_1 None
  openssl            anaconda/pkgs/main/win-64::openssl-3.0.16-h3f729d1_0 None
  pip                anaconda/pkgs/main/win-64::pip-25.0-py312haa95532_0 None
  python             anaconda/pkgs/main/win-64::python-3.12.9-h14ffc60_0 None
  setuptools         anaconda/pkgs/main/win-64::setuptools-75.8.0-py312haa95532_0 None
  sqlite             anaconda/pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0 None
  tk                 anaconda/pkgs/main/win-64::tk-8.6.14-h0416ee5_0 None
  tzdata             anaconda/pkgs/main/noarch::tzdata-2025a-h04d1e81_0 None
  vc                 anaconda/pkgs/main/win-64::vc-14.42-haa95532_4 None
  vs2015_runtime     anaconda/pkgs/main/win-64::vs2015_runtime-14.42.34433-he0abc0d_4 None
  wheel              anaconda/pkgs/main/win-64::wheel-0.45.1-py312haa95532_0 None
  xz                 anaconda/pkgs/main/win-64::xz-5.6.4-h4754444_1 None
  zlib               anaconda/pkgs/main/win-64::zlib-1.2.13-h8cc25b3_1 None


Proceed ([y]/n)? y

Preparing transaction: done
Verifying transaction: | |
```

```
Proceed ([y]/n)? y

Preparing transaction: done
Verifying transaction: done
Executing transaction: done
#
# To activate this environment, use
#
#     $ conda activate gpu_default
#
# To deactivate an active environment, use
#
#     $ conda deactivate

Retrieving notices: ...working... done
```

1.2 查看虚拟环境是否安装成功

Bash

```bash
conda activate gpu_default
python -V
```

```
(open_manus) PS C:\Users\19410> conda activate gpu_default
(gpu_default) PS C:\Users\19410> python -V
Python 3.12.9
(gpu_default) PS C:\Users\19410>
```

二、PyTorch CPU 环境搭建(建议)

Bash

```bash
# 参考: https://pytorch.org/get-started/previous-versions/
# 使用阿里云python pip源: https://mirrors.aliyun.com/pypi/simple/
# 安装命令
# pip install xxx -i https://mirrors.aliyun.com/pypi/simple/
pip install torch==2.3.1 torchvision==0.18.1 torchaudio==2.3.1
```

```
Downloading https://mirrors.aliyun.com/pypi/packages/90/24/84c0997e8a062901882f46d6d9c40b0372090fb29fd7c0b219c38fff7f10800/tbb-2021.13.1-py3-none-win_amd64.whl (286 kB)
Collecting MarkupSafe>=2.0 (from jinja2->torch==2.3.1)
  Downloading https://mirrors.aliyun.com/pypi/packages/c1/80/a61f99dc3a936413c3ee4e1eecac96c0da5ed87ad56fd975f1a9da5bc630/MarkupSafe-3.0.2-cp312-cp312-win_amd64.whl (15 kB)
Collecting mpmath<1.4,>=1.1.0 (from sympy->torch==2.3.1)
  Downloading https://mirrors.aliyun.com/pypi/packages/43/e3/7d92a15f894aa0c9c4b49b8ee9ac9850d6e63b03c9c32c0367a13ae62209/mpmath-1.3.0-py3-none-any.whl (536 kB)
                                        536.2/536.2 kB 1.0 MB/s eta 0:00:00
Installing collected packages: tbb, mpmath, intel-openmp, typing-extensions, sympy, pillow, numpy, networkx, mkl, MarkupSafe, fsspec, filelock, jinja2, torch, torchvision, torchau
dio
Successfully installed MarkupSafe-3.0.2 filelock-3.18.0 fsspec-2025.3.2 intel-openmp-2021.4.0 jinja2-3.1.6 mkl-2021.4.0 mpmath-1.3.0 networkx-3.4.2 numpy-2.2.4 pillow-11.1.0 sympy
-1.13.3 tbb-2021.13.1 torch-2.3.1 torchaudio-2.3.1 torchvision-0.18.1 typing-extensions-4.13.1
(cpu_default) PS C:\Users\19410> pip list
Package            Version
------------------ ---------
filelock           3.18.0
fsspec             2025.3.2
intel-openmp       2021.4.0
Jinja2             3.1.6
MarkupSafe         3.0.2
mkl                2021.4.0
mpmath             1.3.0
networkx           3.4.2
numpy              2.2.4
pillow             11.1.0
pip                25.0
setuptools         75.8.0
sympy              1.13.3
tbb                2021.13.1
torch              2.3.1
torchaudio         2.3.1
torchvision        0.18.1
typing_extensions  4.13.1
wheel              0.45.1
(cpu_default) PS C:\Users\19410>
```

Bash

```bash
# 测试安装是否正常
# 1. 进入python命令行
python
# 2. python命令行中输入一下命令
import torch
torch.__version__
torch.rand(2,3)


# 查看正常的numpy 版本
import numpy as np
np.__version__
```

```
(cpu_default) PS C:\Users\19410> python
Python 3.12.9 | packaged by Anaconda, Inc. | (main, Feb  6 2025, 18:49:16) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import torch
>>> torch.__version__
'2.3.1+cpu'
>>> torch.rand(2,3)
tensor([[0.1779, 0.9306, 0.1183],
        [0.7449, 0.4182, 0.0382]])
>>>
```

```
>>> import numpy as np
>>> np.__version__
'1.26.4'
```

三、PyTorch GPU 环境搭建

3.1 查看 GPU 版本及驱动信息

Bash

```bash
# 查看驱动信息，如果查看不到，需要确定GPU版本以及是否安装好nvidia驱动
# NOTE: 当前默认仅支持nvidia gpu
nvidia-smi
```

```
(gpu_default) PS C:\Users\19410> nvidia-smi
Mon Apr  7 22:44:26 2025
+-----------------------------------------------------------------------------------------+
| NVIDIA-SMI 572.42                 Driver Version: 572.42         CUDA Version: 12.8      |
|-----------------------------------------+------------------------+----------------------+
| GPU  Name                 Driver-Model  | Bus-Id          Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |           Memory-Usage | GPU-Util  Compute M. |
|                                         |                        |               MIG M. |
|=========================================+========================+======================|
|   0  NVIDIA GeForce RTX 4060 ...  WDDM  |   00000000:01:00.0 Off |                  N/A |
| N/A   35C    P0              14W /  120W |      0MiB /   8188MiB  |      0%      Default |
|                                         |                        |                  N/A |
+-----------------------------------------+------------------------+----------------------+

+-----------------------------------------------------------------------------------------+
| Processes:                                                                              |
|  GPU   GI   CI              PID   Type   Process name                       GPU Memory  |
|        ID   ID                                                              Usage       |
|=========================================================================================|
|  No running processes found                                                             |
+-----------------------------------------------------------------------------------------+
```

3.2 安装 pytorch gpu 环境及测试

```bash
# 参考: https://pytorch.org/get-started/previous-versions/
# 安装命令
pip install torch==2.3.1 torchvision==0.18.1 torchaudio==2.3.1 \
    --index-url https://download.pytorch.org/whl/cu121
```

```bash
# 测试安装是否正常
# 1. 进入python命令行
python
# 2. python命令行中输入一下命令
import torch
torch.__version__
torch.rand(2,3)
torch.rand(2,3).cuda()
torch.rand(2,3).to(device=torch.device('cuda'))
torch.cuda.is_available()
torch.cuda.device_count()

# 查看正常的numpy 版本
import numpy as np
np.__version__
```

```
(gpu_default) PS C:\Users\19410> python
Python 3.12.9 | packaged by Anaconda, Inc. | (main, Feb  6 2025, 18:49:16) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import torch
>>> torch.__version__
'2.3.1+cu121'
>>> torch.rand(2,3)
tensor([[0.4298, 0.6132, 0.0386],
        [0.3292, 0.1240, 0.3015]])
>>> torch.rand(2,3).cuda()
tensor([[0.7835, 0.8066, 0.7745],
        [0.8585, 0.7237, 0.0405]], device='cuda:0')
>>> torch.rand(2,3).to(device=torch.device('cuda'))
tensor([[0.3078, 0.6172, 0.0839],
        [0.8576, 0.3886, 0.7814]], device='cuda:0')
>>> torch.cuda.is_available()
True
>>> torch.cuda.device_count()
1
>>>
```

```
>>> import numpy as np
>>> np.__version__
'1.26.4'
```

四、异常说明

4.1 Numpy 版本建议 1.x 版本，当 Numpy 版本为某些 2.x 的时候，会有异常提示

解决方案：重新安装 numpy：pip install numpy==1.26.4

NOTE：如果安装 numpy 其它 1.x 版本存在异常的时候，可以重试其它版本。或者尝试其它 2.x 的版本；

▼ Numpy 异常描述

```
A module that was compiled using NumPy 1.x cannot be run in
NumPy 2.2.4 as it may crash. To support both 1.x and 2.x
versions of NumPy, modules must be compiled with NumPy 2.0.
Some module may need to rebuild instead e.g. with 'pybind11>=2.12'.

If you are a user of the module, the easiest solution will be to
downgrade to 'numpy<2' or try to upgrade the affected module.
```

```
>>> torch.rand(2,3)

A module that was compiled using NumPy 1.x cannot be run in
NumPy 2.2.4 as it may crash. To support both 1.x and 2.x
versions of NumPy, modules must be compiled with NumPy 2.0.
Some module may need to rebuild instead e.g. with 'pybind11>=2.12'.

If you are a user of the module, the easiest solution will be to
downgrade to 'numpy<2' or try to upgrade the affected module.
We expect that some modules will need time to support NumPy 2.

Traceback (most recent call last):  File "<stdin>", line 1, in <module>
  File "D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor.py", line 464, in __repr__
    return torch._tensor_str._str(self, tensor_contents=tensor_contents)
  File "D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor_str.py", line 697, in _str
    return _str_intern(self, tensor_contents=tensor_contents)
  File "D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor_str.py", line 617, in _str_intern
    tensor_str = _tensor_str(self, indent)
  File "D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor_str.py", line 349, in _tensor_str
    formatter = _Formatter(get_summarized_data(self) if summarize else self)
  File "D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor_str.py", line 138, in __init__
    tensor_view, torch.isfinite(tensor_view) & tensor_view.ne(0)
D:\anaconda3\envs\cpu_default\Lib\site-packages\torch\_tensor_str.py:138: UserWarning: Failed to initialize NumPy: _ARRAY_API not found (Triggered internally at ..\torch\csrc\util
s\tensor_numpy.cpp:84.)
    tensor_view, torch.isfinite(tensor_view) & tensor_view.ne(0)
tensor([[0.1474, 0.7330, 0.1714],
        [0.3393, 0.4929, 0.9555]])
>>>
```