

Pytorch GPU版本——简单入门

1 安装CUDA

(1) 检查电脑是否有合适的GPU

在桌面上右击如果能找到NVIDIA控制面板，则说明该电脑有GPU。控制面板如下，并通过查看系统信息获取支持的Cuda版本。



(2) 下载CUDA

在 <https://docs.nvidia.com/cuda/cuda-toolkit-release-notes/index.html> 这里可以查询到我们应该下载哪个版本

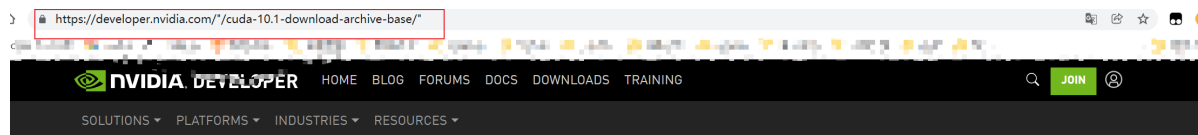
CUDA Version	Minimum GPU Compute Capability	Minimum Driver Version
CUDA 11.4.0 GA	>=470.42.01	>=471.11
CUDA 11.3.1 Update 1	>=465.19.01	>=465.89
CUDA 11.3.0 GA	>=465.19.01	>=465.89
CUDA 11.2.2 Update 2	>=460.32.03	>=461.33
CUDA 11.2.1 Update 1	>=460.32.03	>=461.09
CUDA 11.2.0 GA	>=460.27.03	>=460.82
CUDA 11.1.1 Update 1	>=455.32	>=456.81
CUDA 11.1 GA	>=455.23	>=456.38
CUDA 11.0.3 Update 1	>= 450.51.06	>= 451.82
CUDA 11.0.2 GA	>= 450.51.05	>= 451.48
CUDA 11.0.1 RC	>= 450.36.06	>= 451.22
CUDA 10.2.89	>= 440.33	>= 441.22
CUDA 10.1 (10.1.105 general release, and updates)	>= 418.39	>= 418.96
CUDA 10.0.130	>= 410.48	>= 411.31
CUDA 9.2 (9.2.148 Update 1)	>= 396.37	>= 398.26
CUDA 9.2 (9.2.88)	>= 396.26	>= 397.44
CUDA 9.1 (9.1.85)	>= 390.46	>= 391.29
CUDA 9.0 (9.0.76)	>= 384.81	>= 385.54
CUDA 8.0 (8.0.61 GA2)	>= 375.26	>= 376.51
CUDA 8.0 (8.0.44)	>= 367.48	>= 369.30
CUDA 7.5 (7.5.16)	>= 352.31	>= 353.66
CUDA 7.0 (7.0.28)	>= 346.46	>= 347.62

确定好此设备最高兼容，CUDA10.1后去官网下载对应的CUDA 版本 <https://developer.nvidia.com/cuda-toolkit-archive>

Archived Releases

CUDA Toolkit 11.5.1 (November 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.5.0 (October 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.4.3 (November 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.4.2 (September 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.4.1 (August 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.4.0 (June 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.3.1 (May 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.3.0 (April 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.2.2 (March 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.2.1 (February 2021), [Versioned Online Documentation](#)
CUDA Toolkit 11.2.0 (December 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.1.1 (November 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.1.0 (December 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.0.3 (November 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.0.2 (November 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.0.2 (December 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.0.1 (November 2020), [Versioned Online Documentation](#)
CUDA Toolkit 11.0.0 (November 2020), [Versioned Online Documentation](#)
~~CUDA Toolkit 10.2 (Nov 2019), [Versioned Online Documentation](#)~~
CUDA Toolkit 10.1 update2 (Aug 2019), [Versioned Online Documentation](#)
CUDA Toolkit 10.1 update1 (May 2019), [Versioned Online Documentation](#)
CUDA Toolkit 10.1 (Feb 2019), [Online Documentation](#)
~~CUDA Toolkit 10.0 (Sept 2018), [Online Documentation](#)~~
CUDA Toolkit 9.2 (May 2018), [Online Documentation](#)
CUDA Toolkit 9.1 (Dec 2017), [Online Documentation](#)
CUDA Toolkit 9.0 (Sept 2017), [Online Documentation](#)
CUDA Toolkit 8.0 GA2 (Feb 2017), [Online Documentation](#)
CUDA Toolkit 8.0 GA1 (Sept 2016), [Online Documentation](#)
CUDA Toolkit 7.5 (Sept 2015)
CUDA Toolkit 7.0 (March 2015)
CUDA Toolkit 6.5 (August 2014)

注意：此处官网有误 <https://developer.nvidia.com/cuda-toolkit-archive>；现在进去官网后找到指定CUDA后（尤其是早期的版本）会报错，如下图所示：

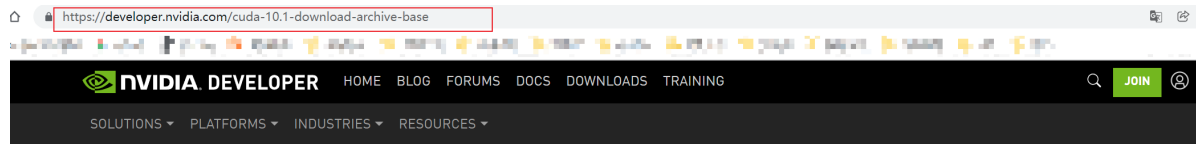


首页

Page Not Found

Even AI can't find this page!

解决方案：把网址统一修改成以下格式即可访问（不知未来是否会修改）把中间的“-”修改成“.”



首页 > High Performance Computing > CUDA Toolkit > CUDA Toolkit Archive > CUDA Toolkit 10.1 original Archive

CUDA Toolkit 10.1 original Archive

Select Target Platform ⓘ

Click on the green buttons that describe your target platform. Only supported platforms will be shown.

Operating System

Windows Linux Mac OSX

Documentation >

Release Notes >

Code Samples >

Legacy Releases >

Additional Resources



Training



Forums



End User License Agreement



CUDA FAQ



Open Source Packages

(3) 安装CUDA

选择对应的系统和版本，最好选择local模式（本地安装）

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown.

Operating System 01 Windows Linux Mac OSX

Architecture 02 x86_64

Version 03 10 8.1 7 Server 2019 Server 2016 Server 2012 R2

Installer Type 04 exe (network) exe (local)

Download Installer for Windows 10 x86_64














The base installer is available for download below.

Base Installer 06 Download [2.5 GB]

Installation Instructions:

1. Double click `cuda_10.1.243_426.00_win10.exe` 05 cuda 的具体版本信息
2. Follow on-screen prompts

下载完成后，直接选择安装（选择默认安装即可）；注意有时候可能会报错，报错的原因多是电脑已经安装了一个自带的SDK，在控制面板找到卸载即可。

 NVIDIA CUDA Development 11.2	NVIDIA Corporation
 NVIDIA CUDA Documentation 11.2	NVIDIA Corporation
 NVIDIA CUDA Nsight NVTX 11.2	NVIDIA Corporation
 NVIDIA CUDA Runtime 11.2	NVIDIA Corporation
 NVIDIA CUDA Samples 11.2	NVIDIA Corporation
 NVIDIA CUDA Visual Studio Integration 11.2	NVIDIA Corporation
 NVIDIA GeForce Experience 3.21.0.36	NVIDIA Corporation
 NVIDIA Nsight Compute 2020.3.0	NVIDIA Corporation
 NVIDIA Nsight Systems 2020.4.3	NVIDIA Corporation
 NVIDIA Nsight Visual Studio Edition 2020.3.0.20315	NVIDIA Corporation
 NVIDIA PhysX 系统软件 9.20.0221	NVIDIA Corporation
 NVIDIA Tools Extension SDK (NVTX) - 64 bit	NVIDIA Corporation
 NVIDIA 图形驱动程序 462.42	NVIDIA Corporation

(4) 查看是否安装成功。

win+R, 打开cmd窗口, 输入nvcc -V, 显示CUDA版本信息, 安装成功

```

C:\Windows\system32\cmd.exe
Microsoft Windows [版本 10.0.19041.329]
(c) 2020 Microsoft Corporation. 保留所有权利。

C:\Users\lucky>nvcc -V
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2019 NVIDIA Corporation
Built on Sun_Jul_28_19:12:52_Pacific_Daylight_Time_2019
Cuda compilation tools, release 10.1, V10.1.243

C:\Users\lucky>

```

2 安装cuDNN

cuda安装完成之后, 还需要下载与CUDA对应的相应版本的cuDNN, 到下图所示的下载页面, 下载完成后, 将这个压缩包里的所有文件放到CUDA10安装目录相应文件夹下即可。(此网站需要先用邮箱注册)

<https://developer.nvidia.com/rdp/cudnn-archi>

Download cuDNN v8.2.2 (July 6th, 2021), for CUDA 11.4
Download cuDNN v8.2.2 (July 6th, 2021), for CUDA 10.2
Download cuDNN v8.2.1 (June 7th, 2021), for CUDA 11.x
Download cuDNN v8.2.1 (June 7th, 2021), for CUDA 10.2
Download cuDNN v8.2.0 (April 23rd, 2021), for CUDA 11.x
Download cuDNN v8.2.0 (April 23rd, 2021), for CUDA 10.2
Download cuDNN v8.1.1 (February 26th, 2021), for CUDA 11.0, 11.1 and 11.2
Download cuDNN v8.1.1 (February 26th, 2021), for CUDA 10.2
Download cuDNN v8.1.0 (January 26th, 2021), for CUDA 11.0, 11.1 and 11.2
Download cuDNN v8.1.0 (January 26th, 2021), for CUDA 10.2
Download cuDNN v8.0.5 (November 9th, 2020), for CUDA 11.1
Download cuDNN v8.0.5 (November 9th, 2020), for CUDA 11.0
Download cuDNN v8.0.5 (November 9th, 2020), for CUDA 10.2
Download cuDNN v8.0.5 (November 9th, 2020), for CUDA 10.1
Download cuDNN v8.0.4 (September 28th, 2020), for CUDA 11.1
Download cuDNN v8.0.4 (September 28th, 2020), for CUDA 11.0

下载之后,

(1) 解压

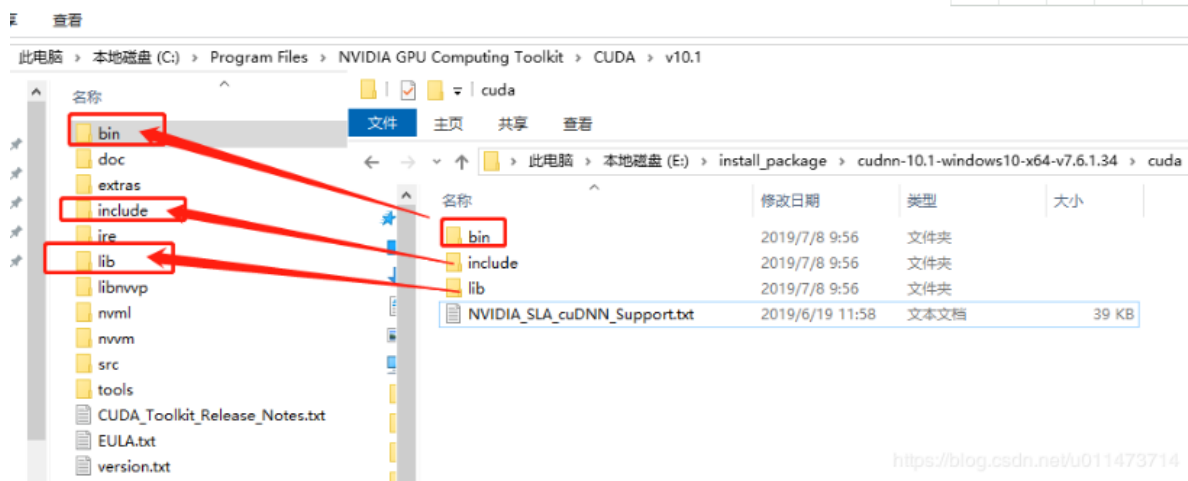
会生成cuda/include、cuda/lib、cuda/bin三个目录;

此电脑 > 新加卷 (D:) > 迅雷下载 > cudnn-10.1-windows10-x64-v7.6.5.32 > cuda >				
名称	修改日期	类型	大小	
bin	2020/6/22 20:04	文件夹		
include	2020/6/22 20:04	文件夹		
lib	2020/6/22 20:04	文件夹		
NVIDIA_SLA_cuDNN_Support.txt	2019/10/27 15:16	文本文档	39 KB	

(2) 复制cuDNN文件到CUDA文件夹

分别将cuda/include、cuda/lib、cuda/bin三个目录中的内容拷贝到C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1对应的include、lib、bin目录下即可。

注意: 不是替换文件夹, 而是将文件放入对应的文件夹中

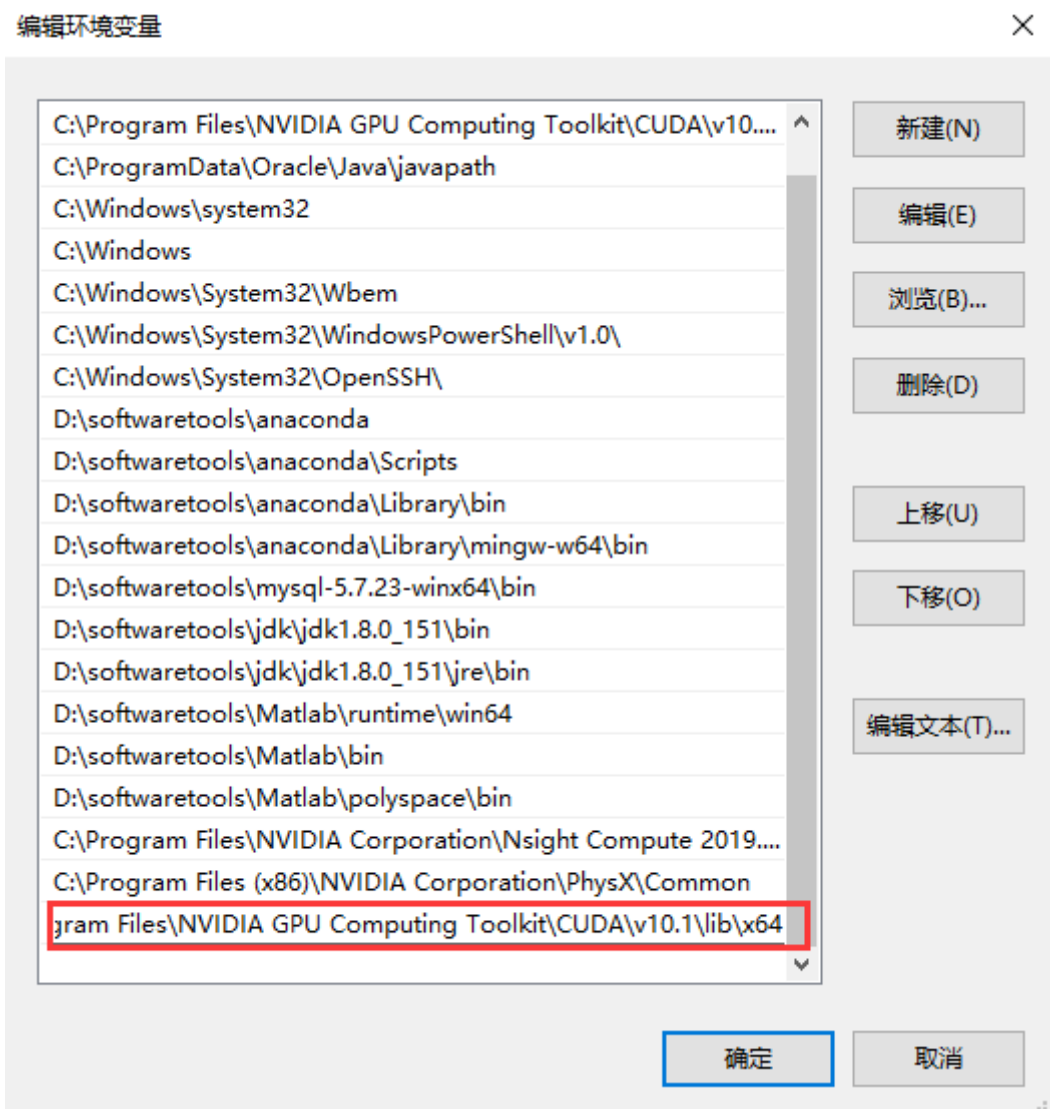


(3) 检添加cuDNN到环境变量

若有，则无需这一步

此电脑→“高级系统设置”→“环境变量”→“系统变量”→“path”→“编辑”→“新建”加入该路径即可。

C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1\lib\x64

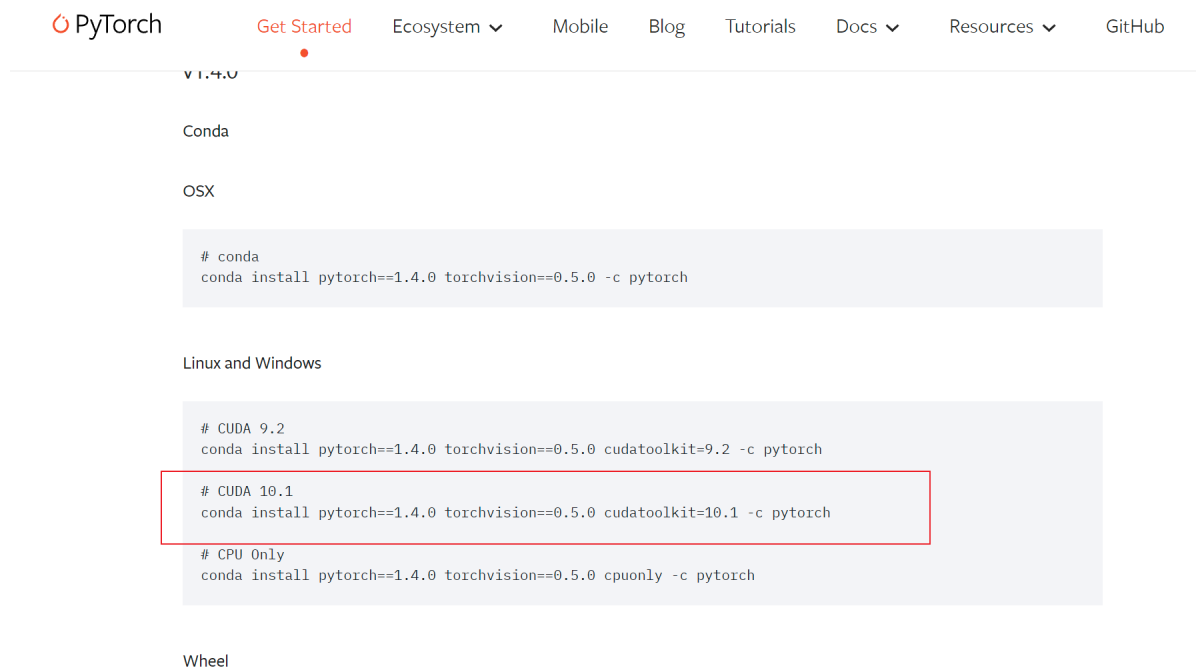


3 安装对应版本的Pytorch

(1) 在线安装（不推荐）

在线网站，因为经常会报错，而且网速有时候被限制。不推荐此种方式

<https://pytorch.org/get-started/previous-versions/>



PyTorch

Get Started Ecosystem Mobile Blog Tutorials Docs Resources GitHub

Conda

OSX

```
# conda
conda install pytorch==1.4.0 torchvision==0.5.0 -c pytorch
```

Linux and Windows

```
# CUDA 9.2
conda install pytorch==1.4.0 torchvision==0.5.0 cudatoolkit=9.2 -c pytorch

# CUDA 10.1
conda install pytorch==1.4.0 torchvision==0.5.0 cudatoolkit=10.1 -c pytorch

# CPU Only
conda install pytorch==1.4.0 torchvision==0.5.0 cpuonly -c pytorch
```

Wheel

(2) 本地安装（推荐）

https://download.pytorch.org/whl/torch_stable.html

这里要注意的是，要找到对应的CUDA版本（最前面的CU101表示CUDA 10.1）、Python版本（cp37表示Python 3.7）和操作系统版本要与自己使用的设备一致。点击后下载到本地。

[cu101/torch-1.3.0-cp27-cp27m-manylinux1_x86_64.whl](#)
[cu101/torch-1.3.0-cp27-cp27mu-manylinux1_x86_64.whl](#)
[cu101/torch-1.3.0-cp35-cp35m-manylinux1_x86_64.whl](#)
[cu101/torch-1.3.0-cp35-cp35m-win_amd64.whl](#)
[cu101/torch-1.3.0-cp36-cp36m-manylinux1_x86_64.whl](#)
[cu101/torch-1.3.0-cp36-cp36m-win_amd64.whl](#)
[cu101/torch-1.3.0-cp37-cp37m-manylinux1_x86_64.whl](#)
[cu101/torch-1.3.0-cp37-cp37m-win_amd64.whl](#)
[cu101/torch-1.3.1-cp27-cp27m-linux_x86_64.whl](#)
[cu101/torch-1.3.1-cp27-cp27mu-linux_x86_64.whl](#)
[cu101/torch-1.3.1-cp35-cp35m-linux_x86_64.whl](#)
[cu101/torch-1.3.1-cp35-cp35m-win_amd64.whl](#)
[cu101/torch-1.3.1-cp36-cp36m-linux_x86_64.whl](#)
[cu101/torch-1.3.1-cp36-cp36m-win_amd64.whl](#)
[cu101/torch-1.3.1-cp37-cp37m-linux_x86_64.whl](#)
[cu101/torch-1.3.1-cp37-cp37m-win_amd64.whl](#)
[cu101/torch-1.4.0-cp27-cp27m-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp27-cp27mu-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp35-cp35m-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp35-cp35m-win_amd64.whl](#)
[cu101/torch-1.4.0-cp36-cp36m-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp36-cp36m-win_amd64.whl](#)
[cu101/torch-1.4.0-cp37-cp37m-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp37-cp37m-win_amd64.whl](#)
[cu101/torch-1.4.0-cp38-cp38-linux_x86_64.whl](#)
[cu101/torch-1.4.0-cp38-cp38-win_amd64.whl](#)

下载在本地后采用本地安装的方式，在cmd中先cd 到Pytorch的安装位置，然后使用conda install torch-1.4.0-cp37-cp37m-win_amd64.whl（这里 torch-1.4.0-cp37-cp37m-win_amd64.whl 即默认下载的文件名）即可。** 如果无法安装，可使用pip install torch-1.4.0-cp37-cp37m-win_amd64.whl 再次尝试。

4 检查是否安装完成

输入以下代码，可以检查是否安装成功，若出现TRUE则表示安装完成。同时可以展示GPU的版本详情。

```
# 检查Pytorch GPU版本是否可用
import torch
print(torch.cuda.is_available())
print('\n'+torch.cuda.get_device_name(0))
```



```
1 # 检查Pytorch GPU版本是否可用
2 import torch
3 print(torch.cuda.is_available())
4 print('\n'+torch.cuda.get_device_name(0))
```

[3] ✓ 0.5s

... True

GeForce RTX 3060 Laptop GPU