

How to install CUDA Toolkit on your personal Windows PC

What is CUDA Toolkit and why do you need it?

In simple words CUDA Toolkit allows you to develop software capable of utilising GPUs. CUDA Toolkit allows you to use CUDA runtime library for your C/C++ projects. CUDA Toolkit allows you to enable GPU acceleration for some useful Python libraries like Tensorflow, Numba, CuPy.

Checking if you already have CUDA Toolkit installed.

Open CLI and run `nvcc -V` command. If you get a similar output you already have CUDA Toolkit version installed. You might need to install additional software like cuDNN for Tensorflow.
Python_download

Checking your NVIDIA Driver version

Open CLI and run `nvidia-smi` command. If the command returns an error, you don't have an NVIDIA Driver installed. The highlighted number is your exact NVIDIA Driver version.

Note: CUDA version number in the table represents the latest CUDA Toolkit version your current NVIDIA Driver supports. It does not represent your currently installed CUDA Toolkit version, or even if you have it installed. Python_download

Installing NVIDIA Driver

Even if you have an NVIDIA Driver installed, you might need to upgrade your current version, to access the newest CUDA version.

1. Open following link in your browser:
<https://www.nvidia.co.uk/Download/index.aspx?lang=en-uk>
2. Fill out the dropdown list on the website.
3. In case you don't know exact name of your GPU:
 - In the Windows search bar enter "Device Manager".
 - Click the arrow next to Display adapters.
 - Find the GPU starting with NVIDIA, this is your GPU.

Download the driver.

Follow the installation instructions.

Reboot your computer.

Open CLI and run `nvidia-smi` command. If the driver version changed, you successfully updated your NVIDIA Driver version.

Installing CUDA Toolkit

1. Open following link in your browser:
<https://developer.nvidia.com/cuda-downloads>
 2. Follow the instructions
 3. Select exe (network or local) and click the download button
 4. Follow the installer instructions
- Installer will try to install GeForce Experience software. To disable it, use the custom install option.

Reboot your PC.

Open CLI and run `nvcc -V` command. If you get an output containing the version of the CUDA Toolkit you selected, you successfully installed CUDA Toolkit on your computer.

Note: If you execute `nvcc -V` command from the Anaconda Prompt CLI from the environment with pytorch library, it might display CUDA Toolkit version installed with pytorch instead of the one installed in your system.

Installing cuDNN library

This is an additional library you need to install to enable GPU computation in tensorflow.

1. Open following link in your browser:
<https://developer.nvidia.com/rdp/cudnn-archive>
2. Select the desired cuDNN version.
3. Follow the instructions
4. Select exe(network) and click the download button
5. Follow the installer instructions

Installing a different version of CUDA Toolkit

NOTE:

Please complete the whole reading before proceeding, uninstalling Nvidia Driver can negatively affect your PC. Please be sure to do additional research on how to correctly uninstall graphics drivers.

In some cases you will need to install older versions of both CUDA Toolkit and cuDNN.

Example: Repository for StyleGAN 2 requires you to have tensorflow 1.15. This version of tensorflow does not support newer versions of CUDA Toolkit.

1. Before proceeding, be sure that the configuration you want to install is supported. To do this consult CUDA Toolkit and cuDNN compatibility matrices:
https://docs.nvidia.com/deploy/cuda-compatibility/index.html#binary-compatibility__table-toolkit-driver
<https://docs.nvidia.com/deeplearning/cudnn/archives/cudnn-801-preview/cudnn-support-matrix/index.html>
<https://docs.nvidia.com/deeplearning/cudnn/reference/support-matrix.html>
 2. Completely uninstall CUDA Toolkit. They can be found in
Windows Settings > Apps > Apps & features
 3. If your current NVIDIA Driver version supports the desired CUDA Toolkit version, proceed to step 5.
 4. **This step is very risky!**
If your current NVIDIA Driver version does not support the desired CUDA version, you would have to uninstall your current Nvidia Driver and install the appropriate version. This can be done in:
Windows Settings > Apps > Apps & features
 5. Install the desired CUDA Toolkit from here <https://developer.nvidia.com/cuda-toolkit-archive>.
 6. Install the desired cuDNN version.
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