## Installing Tensorflow GPU, CUDA and cuDNN

## First Install Visual Studio Community Edition

## <https://visualstudio.microsoft.com/>

## From <https://www.tensorflow.org/install/gpu> :

The following NVIDIA® software must be installed on your system:

* [NVIDIA® GPU drivers](https://www.nvidia.com/drivers) —CUDA 10.1 requires 418.x or higher.
* [CUDA® Toolkit](https://developer.nvidia.com/cuda-toolkit-archive) —TensorFlow supports CUDA 10.1 (TensorFlow >= 2.1.0)
* [CUPTI](http://docs.nvidia.com/cuda/cupti/) ships with the CUDA Toolkit.
* [cuDNN SDK](https://developer.nvidia.com/cudnn) (>= 7.6)
* (Optional) [TensorRT 6.0](https://docs.nvidia.com/deeplearning/sdk/tensorrt-install-guide/index.html) to improve latency and throughput for inference on some models.

Windows setup

See the [hardware requirements](https://www.tensorflow.org/install/gpu#hardware_requirements) and [software requirements](https://www.tensorflow.org/install/gpu#software_requirements) listed above. Read the [CUDA® install guide for Windows](https://docs.nvidia.com/cuda/cuda-installation-guide-microsoft-windows/).

Make sure the installed NVIDIA software packages match the versions listed above. In particular, TensorFlow will not load without the cuDNN64\_7.dll file. To use a different version, see the [Windows build from source](https://www.tensorflow.org/install/source_windows) guide.

Add the CUDA, CUPTI, and cuDNN installation directories to the %PATH% environmental variable. For example, if the CUDA Toolkit is installed to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1 and cuDNN to C:\tools\cuda, update your %PATH% to match:

SET PATH=C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1\bin;%PATH%

SET PATH=C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1\extras\CUPTI\libx64;%PATH%

SET PATH=C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.1\include;%PATH%

SET PATH=C:\tools\cuda\bin;%PATH%

Install cuDNN

### [4.3. Installing cuDNN On Windows](https://docs.nvidia.com/deeplearning/sdk/cudnn-install/index.html" \l "installwindows)

The following steps describe how to build a cuDNN dependent program. In the following sections the CUDA v9.0 is used as example:

* Your CUDA directory path is referred to as C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.2
* Your cuDNN directory path is referred to as <installpath>

1. Navigate to your <installpath> directory containing cuDNN.
2. Unzip the cuDNN package.

cudnn-10.2-windows7-x64-v7.6.5.32.zip

or

cudnn-10.2-windows10-x64-v7.6.5.32.zip

1. Copy the following files into the CUDA Toolkit directory.
   1. Copy <installpath>\cuda\bin\cudnn64\_7.6.5.32.dll to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.2\bin.
   2. Copy <installpath>\cuda\ include\cudnn.h to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.2\include.
   3. Copy <installpath>\cuda\lib\x64\cudnn.lib to C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.2\lib\x64.
2. Set the following environment variables to point to where cuDNN is located. To access the value of the $(CUDA\_PATH) environment variable, perform the following steps:
   1. Open a command prompt from the **Start** menu.
   2. Type Run and hit **Enter**.
   3. Issue the control sysdm.cpl command.
   4. Select the **Advanced** tab at the top of the window.
   5. Click **Environment Variables** at the bottom of the window.
   6. Ensure the following values are set:
   7. Variable Name: CUDA\_PATH
   8. Variable Value: C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.2
3. Include cudnn.lib in your Visual Studio project.
   1. Open the Visual Studio project and right-click on the project name.
   2. Click **Linker > Input > Additional Dependencies**.
   3. Add cudnn.lib and click **OK**.