There can be two reasons to choose cuda :

1. Want to learn new technology
2. Want to Apply parallel computing on the chosen domain.

Windows 7/8, vista

1. Want to learn CUDA ?

Should have basic knowledge of GPU, Graphics card, CUDA .

1. Setup environment for CUDA: Before going to prepare for cuda installations
2. Verify System has **CUDA enable Graphics card**.(note: not every system has graphic card, even if it has, it is not necessary that it is compatible with cuda. )
3. Verify which graphics card you have

Steps on windows :Right click on computer ->manage->Device Manager->Display adapter-> G\_CARD\_NAME

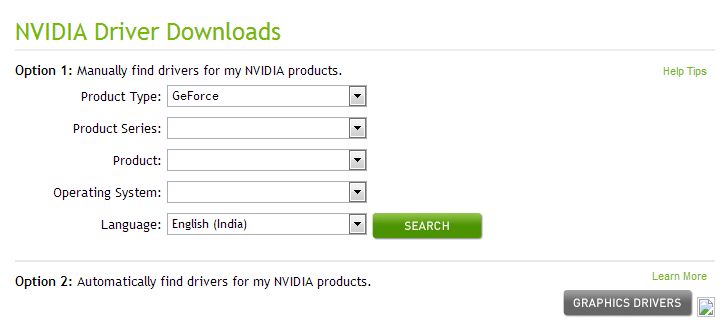
Steps on Ubuntu: Type lspci command in terminal. You will get a lot information

Search for VGA compatible controller line. This will give you the Graphics card model.

1. Go to:

<http://www.nvidia.in/Download/index.aspx?lang=en-in>

you will see,



**Option 1**

1. Give you system details and find G\_CARD\_NAME as the product in the dropdown menu.
2. If found, click on search. It will start download appropriate display driver for your graphics card.

**or**

**Option 2**

4 Automatically detects the graphics card that your system has. (prefer option 1 )

CUDA downloads:

<https://developer.nvidia.com/cuda-downloads>

This link will bring you to the CUDA download page, Choose the download as per your system specification. Download Getting started Guide from the same link.

Getting started guide will give all necessary thorough steps for cuda installation.

Overview of installation steps:

1. Visual Studio 2008
2. Display drivers of G\_CARD
3. CUDA V 5

After installation you have to verify its success.

1. Check a GPU toolkit icon appeared on your screen (if not search it) and open the application.
2. This application has many CUDA programs. RUN any Image Processing or graphical program (RUN link will be there).
3. If it runs successfully, then your CUDA installation has done successfully or else you have to uninstall and repeat whole procedure again.

After Successful installation configure CUDA with Visual Studio:

Read **ConfiguringVSforCUDA.pdf** this pdf has mentioned configuration steps as per specific operating system.

Once VS is configured for CUDA, try any simple program and run through VS.

To enable the syntax highlighting Follow the steps [here](http://codereflect.com/2008/09/04/how-to-enable-syntax-highlighting-for-cuda-files-in-visual-studio-2005/).

1. Copy usertype.dat from Program Files\NVIDIA Corporation\NVIDIA CUDA SDK\doc\syntax\_highlighting\visual\_studio\_8 to Program Files\Microsoft Visual Studio 8\Common7\IDE.
2. Start Visual Studio and go to Tools -> Options -> Text Editor -> File Extension
3. In the extension box type "cu" and select "Microsoft Visual C++" in the drop down.
4. Restart.

Important note: when you write any CUDA program, you should be always aware of setting the your project properties as per your system capability (whether 32 or 64bit). Prefer to make it default.

Overview of Reference books:

1. CUDA BY EXAMPLE : An introduction to GP GPU Programming by Jason Sanders

CUDA by example helps to learn the Basics of CUDA, Its motive, application and usage. The programming part starts from Chapter 3. This chapter explores how the parallel programming is handled with CUDA.

The very first learning stage starts with “Hello world!” program.

Second is Vector addition program, this is where actually parallel computing is being introduced. It is explained step by step. In next chapters, thread management, types of memory and events are described and explained.

1. Programming Massively Parallel Processors: A Hands on Approach

In this Book first two chapters tells a lot about GPU basics, those who already knew what is GPU, can directly jump on to Chapter 3 introduction to CUDA this chapter explained thoroughly a matrix multiplication program with every aspect.

1. CUDA Programming: A Developer's Guide to Parallel Computing with GPUs (Applications of GPU Computing Series)

Once one is aware about how CUDA program works, it becomes little bit easy to dig little deeper in CUDA programming. This book describes some complex programming skills.