**Guide for Installing AI & Deep Learning Programs (Linux Ubuntu 16.04 – 17)**

**List of Programs we will be installing in this guide.**

1. **Nvidia Drivers (Latest Version from Nvidia Website)**
2. **Nvidia Cuda 9.1**
3. **Nvidia Digits**
4. **Nvidia cuDNN**
5. **Torch**
6. **Caffe**
7. **PyTorch**
8. **TorchVision**
9. **Tensor Flow**
10. **Keras**

**Pre-Installation:**

**Before using this guide make sure you have the following things installed on your system. This guide is applicable for all the Systems running Nvidia Graphics Card/GPU.**

**Make sure you have a fresh copy of Linux Ubuntu 16.04 or greater installed on your system before attempting to use this guide.**

**This guide was developed on a system running Core i7 8700K and GTX 1080Ti but can be used for any Nvidia GPU. I will provide all the steps as easy as possible along with explanations and screen shots.**

**All the commands use in this guide are all single line commands on terminals**

**Nvidia Drivers Installation:**

First, open up a terminal and run this command

**sudo su**

and login as root.

Now after your login its time to update the system. To update your system run this command.

**apt-get update && apt-get upgrade**

After you update the system. Its time to uninstall any older drivers or packages of Nvidia. As you know that Ubuntu by default comes with its own drivers for Nvidia which are on an older version as compare to the current latest drivers. And Cuda 9.1 supports R390 or 390.XX version of drivers.

To uninstall the old drivers please use these command below

**apt-get purge nvidia\***

**apt-get autoremove**

This command will remove your old Nvidia drivers and will allow you to install new drivers. Please note it is not necessary for you to have Nvidia drivers installed of if after running the commands you cannot find any packages for Nvidia its completely fine you can continue ahead.

Now we have the old drivers or installation removed we can go ahead and install the new drivers.

Download the new drivers from Nvidia Official Website. All the supported GPUs are mentioned on the Nvidia drivers page.

<http://www.nvidia.com/download/driverResults.aspx/132530/en-us>

After you download the drivers now its time for installation. The drivers you will download will be a **run** file so before installing we must do a few modifications to that file and install other dependencies for the drivers first.

Run this command.

**apt-get install build-essential gcc-multilib dkms**

The above command will install all the necessary file which we will need for the driver installation.

**Create Blacklist for Nouveau Driver**

Create a file at /etc/modprobe.d/blacklist-nouveau.conf with the following contents:

**blacklist nouveau**

**options nouveau modeset=0**

To create a file open a terminal and type in

**gedit /etc/modprobe.d/blacklist-nouveau.conf**

and copy and paste the above 2 lines and click save.

Now execute **sudo update-initramfs -u** and reboot the computer.

### After you reboot you might notice a few changes on display and resolution. Don’t worry because we will be installing the drivers now.

### Stop lightdm/gdm/kdm

After the computer is rebooted. We need to stop the desktop manager before executing the runfile to install the driver. **lightdm** is the default desktop manager in Ubuntu. If GNOME or KDE desktop environment is used, installed desktop manager will then be **gdm** or **kdm**.

For Ubuntu 16.04, executing

**sudo service lightdm stop** (or use gdm or kdm instead of lightdm)

After you execute the above command the GUI (Graphical User Interface) Will be stopped. Now use this button combination to switch to CLI (Command Line) to install the drivers.

**Ctrl + Alt + F2**

After executing the above command login with your Ubuntu Username and Password which you setup while installing Ubuntu

**Executing the Runfile/Installing Drivers:**

After above batch of preparation, we can eventually start executing the runfile.

Now using the **cd** command navigate to the folder where you downloaded the Drivers. In my case it was in Downloads folder.

**cd ~/Downloads/**

Now type **ls** and it will display you the file which you have downloaded.

The downloaded file will not haver any permissions to run so we need to grant it the executable permission before we can install the drivers. Type in the command below.

**chmod +x (Name of your downloaded file)**

**e.g**

**chmod +x NVIDIA-Linux-x86\_64-390.48.run**

After you have executed the above command we just need to run the installer.

**sudo ./NVIDIA-Linux-x86\_64-390.48.run --dkms -s**

Wait for the driver installation to finish and then reboot your computer by just typing **reboot**  in the terminal.

After the reboot you will see the display back to normal and all the drivers will be installed.

**Check the Installation**

After a successful installation, **nvidia-smi** command will report all your CUDA-capable devices in the system.

### Common Errors and Solutions

1. ERROR: Unable to load the **'nvidia-drm'** kernel module.

* One probable reason is that the system is boot from UEFI but Secure Boot option is turned on in the BIOS setting. Turn it off and the problem will be solved.
* For any other errors please do contact us and let us know.