

在 Windows OS 下安裝環境

1. 預先下載課程資料集與 code

<https://github.com/chihfanhsu/hand-on-dl/>

<https://www.cs.toronto.edu/~kriz/cifar.html> 下載 **CIFAR-10 python version**

2. 如有 NVIDIA GPU 請下列網址首頁設定並安裝 GPU 加速函式庫 CUDA，若無請直接跳過此步驟，並安裝步驟 9 之 openBLAS (建議安裝 Visual Studio 2013) Windows

<http://ankivil.com/installing-keras-theano-and-dependencies-on-windows-10/>

Linux

<https://www.youtube.com/watch?v=wjByPfSfKBo>

3. 安裝 Theano 及相依套件

使用管理者權限打開 Anaconda Prompt 並鍵入

```
conda install theano numpy scipy mingw libpython
```

4. 安裝 keras

使用管理者權限打開 Anaconda Prompt 並鍵入 `pip install keras`

5. 新增檔案並設定 Theano configuration (路徑 C:\Users\[USER NAME]\.theanorc.txt)

A. BLAS 設定方式

```
[global]
openmp=False
device=cpu

[blas]
ldflags=-LC:\openblas -lopenblas
blas.ldflags=-LC:\openblas -lopenblas
```

B. GPU 設定方式

```
[global]
floatX = float32
device = gpu

[nvcc]
fastmath = True
compiler_bindir=C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\bin
```

6. 設定 Keras configuration (路徑 C:\Users\[USER NAME]\.keras\keras.json)，如果找不到此路徑，可以先試試在 python 底下輸入 `import keras`，系統就會自己產生資料夾，但此時會出現錯誤訊息為找不到 tensorflow。

```
{
  "image_dim_ordering": "tf",
  "epsilon": 1e-07,
  "floatx": "float32",
  "backend": "theano"
}
```

7. 請先試跑看看 checkblas.py 如果成功會如同以下輸出

```
We executed 10 calls to gemm with a and b matrices of shapes (5000, 5000) and (5000, 5000).
Total execution time: 20.22s on CPU (with direct Theano binding to blas).
Try to run this script a few times. Experience shows that the first time is not as fast as followings calls. The difference is not big, but consistent.
(C:\Program Files\Anaconda2) C:\>
```

8. 請先試跑下列網址的 CNN 測試程式，如有下列 **Error message** 請安裝第 9 步驟的 OpenBLAS，如可以成功執行則不需要安裝(不用執行到結束，可以成功看到 Training verbose 即可)。

A. CNN 測試程式

https://github.com/fchollet/keras/blob/master/examples/mnist_cnn.py

B. Error message

AssertionError: AbstractConv2d Theano optimization failed: there is no implementation available supporting the requested options. Did you exclude both "conv_dnn" and "conv_gemm" from the optimizer? If on GPU, is cuDNN available and does the GPU support it? If on CPU, do you have a **BLAS** library installed Theano can link against?

C. Training verbose

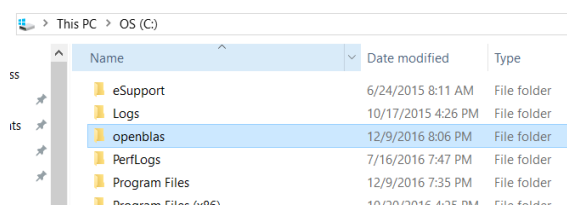
```
128/50000 [.....] - ETA: 60s
256/50000 [.....] - ETA: 61s
384/50000 [.....] - ETA: 60s
```

9. 在 Windows Anaconda2 上安裝 OpenBLAS (加速 CPU 運算速度)

A. 下載 OpenBLAS

<https://mmnet.iis.sinica.edu.tw/~chihfan/openblas.zip>

B. 將解壓縮後的資料夾放在 C:



C. 將 C:\openblas\include 內的檔案全部複製放進以下 Anaconda 的資料夾

C:\Program Files\Anaconda2\include

C:\Program Files\Anaconda2\MinGW\x86_64-w64-mingw32\include

D. 將 C:\openblas\lib 內的檔案全部複製放進

C:\Program Files\Anaconda2\MinGW\x86_64-w64-mingw32\lib

E. 將 C:\Users\[user name]\AppData\Local\Theano 資料夾內的檔案全都刪除

F. 重新開啓 Anaconda Prompt

G. 如果還是有問題請來信 chihfan@iis.sinica.edu.tw 並請您附上錯誤訊息