Deep Learning Introduction:

Lab session

Petr Dokládal

BioMedical Engineering master

Synopsis

- In the lab sessions you will develop 4 exercises, from very simple to a more advanced one developping a CNN classifying skin moles into seven cancer categories.
- You will use the keras [1] library on top of tensorflow [2].
- You will a GPU-accelerated plateform running in cloud provided along with gmail account. Your code and data will be stored at your GDrive.

  Note : *You will be able to run your code from anywhere provided you have an internet connection and a navigator.*
- You need a Gmail account. Connect to Gmail in a navigator. Then you can access the Colab platform at https://colab.research.google.com/ → (Tab Google Drive)
- Your notebooks should reside in the 'Colab Notebooks' directory in your GDrive.

1. a high-level library for neural network programming `https://keras.io/`
2. An open-source machine learning framework `https://www.tensorflow.org/`

Lab assignments

- The exercise assignments are provided as incomplete jupyter notebooks .ipynb containing all necessary helper functions and a pdf containing an example solution you should obtain. You only need to concentrate on coding the deep learning part.
- For the skin cancer the notebook will fetch all the data from a shared GDrive link. (The data are heavy but as long as you copy it inside the goodle cloud it is fast.)
- Open the assignments and save a copy in your Colab. The solution is an example solution of what you should obtain.

Lab session 5 :

1. Exercise 1 : [assignment], [solution]
2. Exercise 2 : [assignment], [solution]
3. Exercise 3 : [assignment], [solution]

Lab session 6 :

4. Exercise 4 : [assignment], [solution] [3]

3. Make sure you activate a GPU accelerator for this exercise in your Colab jupyter.

Lab Report

- The following code at the end of your jupyter allows exporting it in pdf.

```
from google.colab import drive
base_working_dir = '/content/drive/My Drive/Colab Notebooks'
drive.mount('/content/drive')

!sudo apt-get install texlive-xetex texlive-fonts-recommended texlive-generic-recommended

!jupyter nbconvert --to pdf "drive/My Drive/Colab Notebooks/exercise_1_assignment.ipynb"
```

- Once you generated your pdf, rename it – put your names in the filename.

A pdf report from each exercise is due at the latest on January 5, 2020 on Moodle (hard deadline).