Computational anatomy: from MRI to clinical morphological metrics

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Timetable

Monday 10 June:

- Introduction to Python and deep learning

Tuesday 11 June:

- Case study using deep learning
  - Automatic segmentation of clinical images
  - Diagnosis and prognosis of cardiac disease

Wednesday 12 June and Thursday 13 June:

- Build a statistical shape models
- Interpretation of PCA space and it’s use for diagnosis

Material

Code and data for the summer school deep learning workshop.

https://github.com/ericspod/VPHSummerSchool2019

Anaconda

Open source, package and environment management system for **Python**

It ships with:

- Spyder IDE
- Jupyter Notebooks

Preinstalled packages

- Numpy
- Scipy
- Scikit-learn
- Matplotlib

Installing Miniconda

Before the workshop install Miniconda:

- Download Miniconda 3 from:
  - https://docs.conda.io/en/latest/miniconda.html
- For MacOs and Windows:
  - Installation should be as straightforward as clicking on the downloaded file and following the install instructions.
  - Windows: https://www.cs.rpi.edu/academics/courses/fall16/cs1/python_environment/windows_install.html
  - Mac: https://www.cs.rpi.edu/academics/courses/fall16/cs1/python_environment/mac_install.html
- For Linux:
  - Run install script using bash in terminal
  - https://www.cs.rpi.edu/academics/courses/fall16/cs1/python_environment/linux_install.html

Installing Miniconda

- For all platforms, run installer, check the box to change your PATH variable and accept all other settings
- Open a terminal and type the following command:
  - “**conda install jupyter –y**”
- Type on terminal:
  - “**jupyter notebook**”
  - This should open a notebook similar to https://jupyter.org/

Packages to install

Pytorch (deep learning):
conda install pytorch torchvision cudatoolkit=9.0 -c pytorch

Scikit-learn (machine learning):
conda install scikit-learn

Scipy (Image processing)
conda install -c anaconda scipy