Computing Methods for Experimental Physics and Data Analysis

Data Analysis in Medical Physics

Lecture 8: Hands-on Session on feature exploration and analysis

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Today's objective is…

To write your code to:

- To explore the distributions and to carry out a statistical analysis of available samples of features on https://pandora.infn.it/public/cmepda/DATASETS/FEATURES/ or on https://drive.google.com/drive/folders/1YqK7ZkM-P2IrqfD7Pj-SCmjz-GWd_1-Y

    - The ABIDE brain image features extracted with FreeSurfer (Brain_MRI_FS_ABIDE/README.txt)

https://github.com/retico/cmepda_medphys/tree/master/L8_code

Follow the track in

    Lecture8_excercise1.mlx (… and possibly extend it!)

The solution to exercise1 will be provided in matlab and in python

- Lecture8_excercise1_solution.mlx
- Lecture8_ data exploration_Pandas.ipynb

The ABIDE data sample

Autism Brain Imaging Data Exchange (ABIDE)

Two data collections have been released: ABIDE-I and ABIDE-II

rs-fMRI, structural MRI, and phenotypic information are stored and shared publicly

2226 subjects			
1060 ASDs		1166 TDCs	
907 M	153 F	879 M	287 F
Age at Scan 5 – 64 years			
40 different acquisition sites			

http://fcon_1000.projects.nitrc.org/indi/abide

Di Martino, A. et al., **The autism brain imaging data exchange: towards a large-scale evaluation of the intrinsic brain architecture in autism.**
Mol Psychiatry. 2014 Jun;19(6):659-67.

Di Martino, A. et al., **Enhancing studies of the connectome in autism using the autism brain imaging data exchange II.**
Sci Data. 2017 March 14; 4:170010.

The dataset FS_features_ABIDE_males.xlsx available for the exercise contains 419 brain morphological features (volumes, thickness, area, etc.) of brain parcels and global measures, derived for 915 male subjects of the ABIDE dataset. More details are provided in the README.txt file.
A sample with a small number of features is also available: FS_features_ABIDE_males_someGlobals.csv