# Functional structure of the Human Brain

Data analysis project

In this project, you will analyze the fMRI data from the Human Connectome Project that is available here.

The data consists of recordings of the brain activity (fMRI scan) of a thousand young adults in "resting state" (i.e., that they were not doing any specific task when the data was recorded). Each scan contains the activity of 116 brain regions over 2400 time points recorded every 0.5 to 2 seconds.

Using different approaches (such as Principal Component Analysis, network analysis, hierarchical clustering analysis), you will analyze the functional structure of the human brain by extracting which regions tend to be more correlated with each other.

You will perform a statistical comparison analysis across subjects. Most subjects have two scans, so you can also study and compare the similarities between two recordings of the brain activity of the same individual, with the similarities across individuals.

If time permits, you can also work on a statistical inference approach using Ising models (or Maximum entropy models).

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