-SLIDE 1

Hello, my name is \_\_\_\_\_\_, and we’re here to talk about the first case study in the “Understanding Human Brain Connectivity” Project, labeled as “Task Switching”.

This project is headed by professor Sangalli and we are co-tutored by Dr. Clementi and Arnone

-SLIDE 2

We were given data regarding 175 test participants, of which 50 diagnosed with schizophrenia and a control set of 125.

The test asked participants to switch between different objectives, asking them in rapid succession to recognize either shapes or colors of a given input whilst in an fMRI machine. This has been done with the goal of studying the cognitive loading in the two types of subject when asked to switch task and with a final objective of revealing the presence, or lack thereof possible compensation mechanisms inside the brain of a schizophrenic person.

While we expect schizophrenic people to perform worse than the test control, the literature has yielded inconsistent results.

-SLIDE 3

The datasets we were given can be divided in 3 categories,

1. Z-map, a huge data-frame with n<<p, 175 against 36000, where each row represents a subject and each column represents a dot of our 3d-mesh of the brain, the values of each cell is a transformation of the correlation value of the BOLD signal captured during the test, with respect to our area of interest
2. For each subject we were given an n>p data frame of event recordings, like what was the task they were asked to accomplish, was the answer correct, all sequentially listed
3. Finally, some health and impulsivity data from which we are preliminarily taking only general scores, but there’s a lot of wiggle room to play with for secondary analysis aimed at a better comprehension of the subjects.

-SLIDE 4

One of our initial problems has been the interpretation of the problem, like what the heck is connectivity or what did some labels mean, including one called CSI, which we now know stands for Cue Switching Interval, that is the amount of time in which the instructions were displayed before any given task.

And some of our foreseen problems are the dimensionality of the data, in particular of Z-maps and understanding the quality of some of the data, for example, one of the health factors screened was smoking, and a quick look at that part of the data reveals either inconsistencies if not flat out lies in the reported quantities.