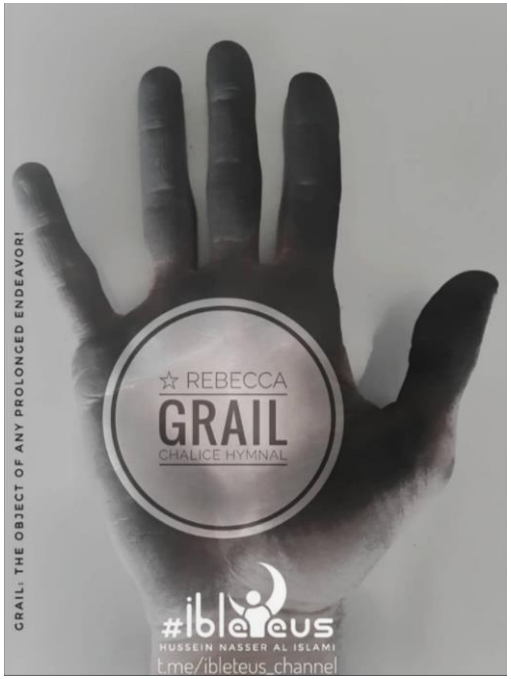
Maintaining the Brain Functional Connectivity (BFC) in the gambling task using the HCP fMRI data-set.



Colorful Snowshoes Pod – July 2021

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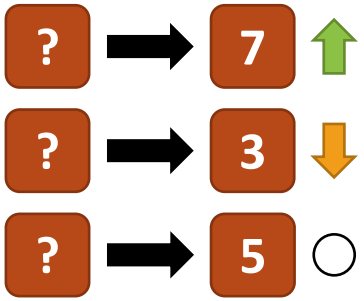
➢ Introduction:

To analyze data-set being preprocessed by HCP© for NMA-2021 that they recorded using fMRI is to analyze in this project to maintain connectivity and correlation of the areas which are involved in the task. What we did was make it inquiry what rate of connectivity and correlation are involved during the gambling task designed to evaluate reaction of participants to stimulus.

The test info:

- 339 subjects, aged 22-35
- 360 Parcellated cortical regions, 180/hemisphere

➢ Methodology:

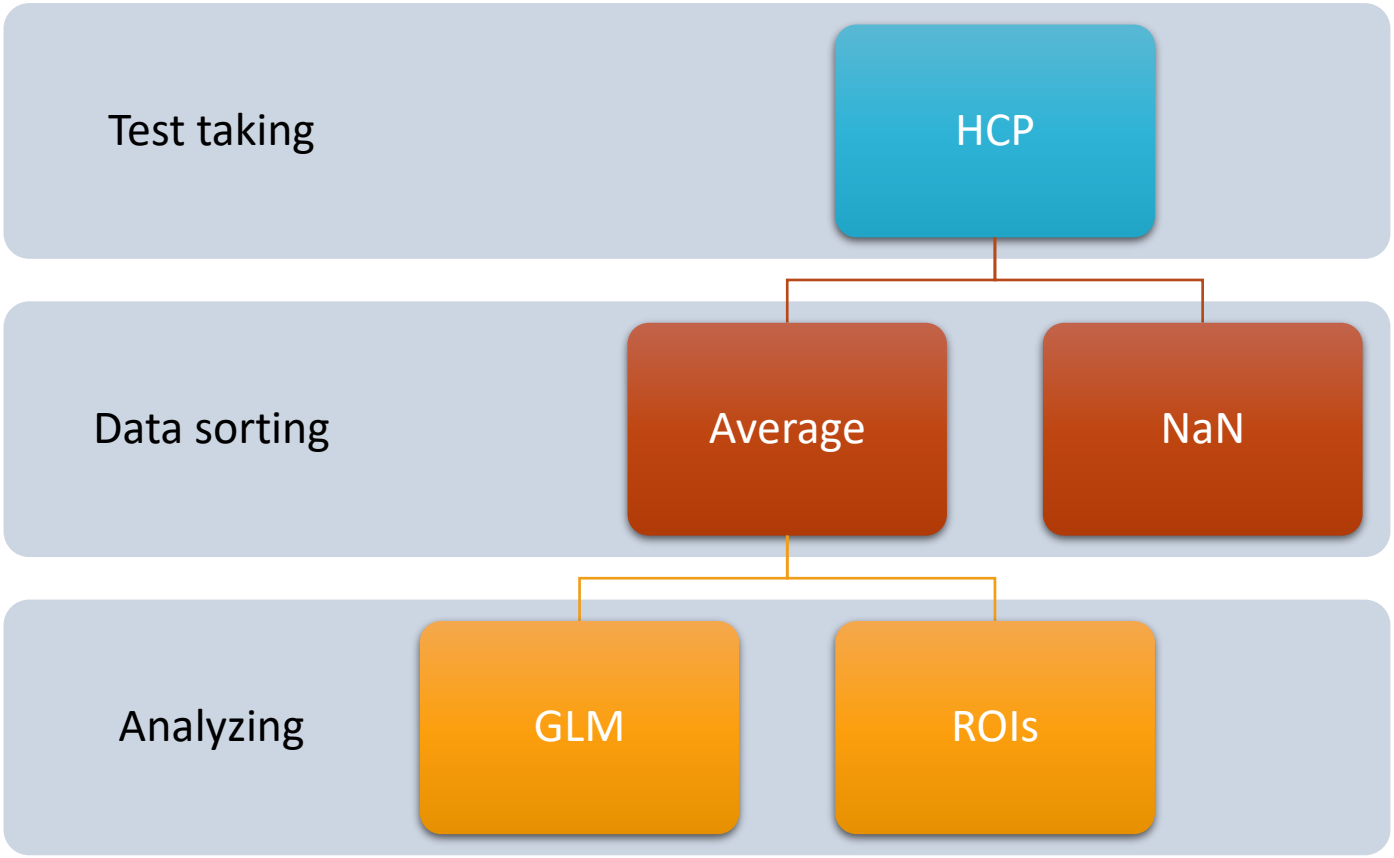


Condition #1 ~ 1$ reward

Condition #2 ~ 0.5 c punishment

Condition #3 ~ neutral

➢ Step by step into the gambling:

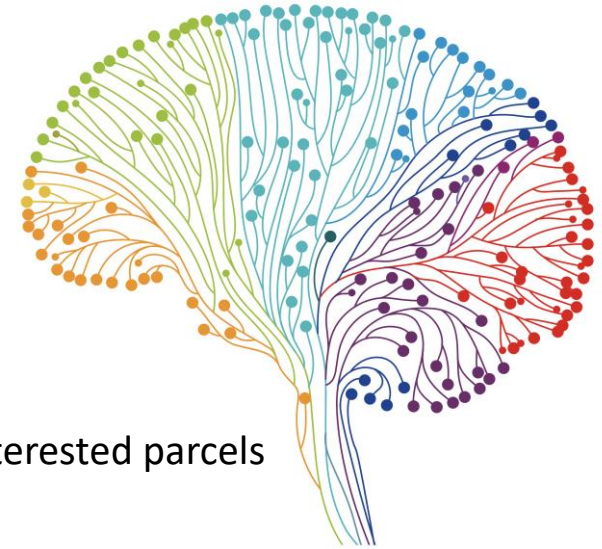


Data Wrangling

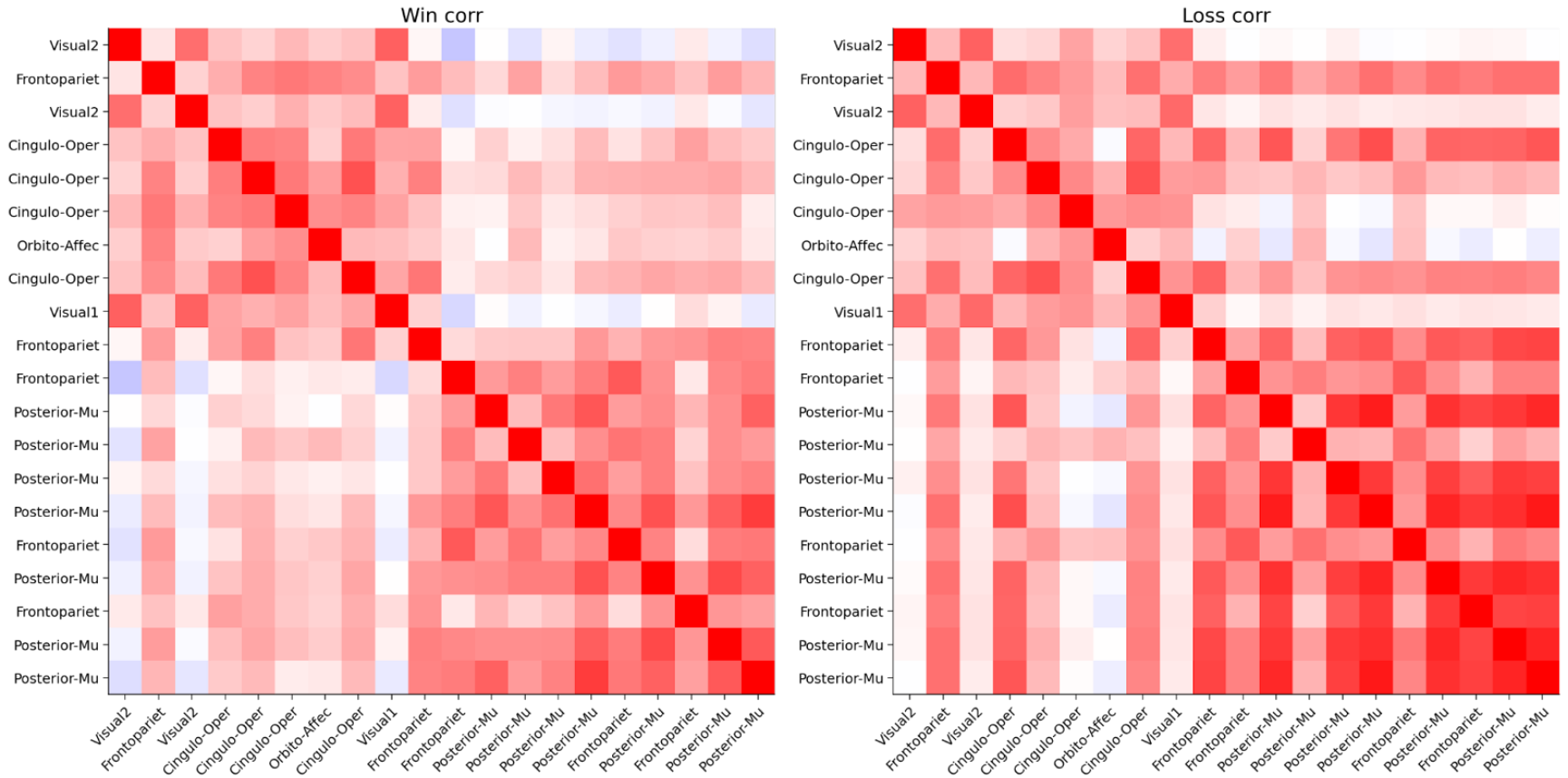
Our data: explanatory variables / condition time / regions.

Our approach:

- Creating a data frame for the brain activity - for each subject and run
- Averaging the activity over the condition time - For each parcel
- Choosing the highest informative parcels (rate of activity in fMRI).
- Using GLM models - to insure that our findings are accurate
- Building the correlation matrix for win/loss conditions - Among all interested parcels
- Visualizing the brain connectivity based on the correlations.



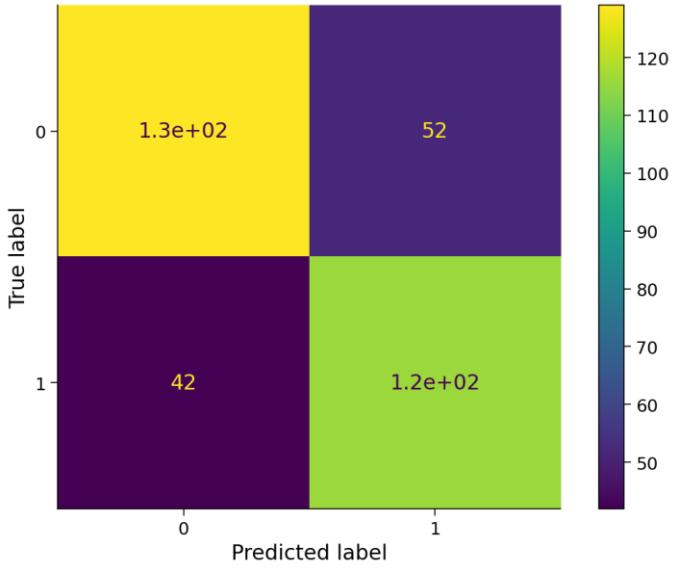
Correlation Matrix

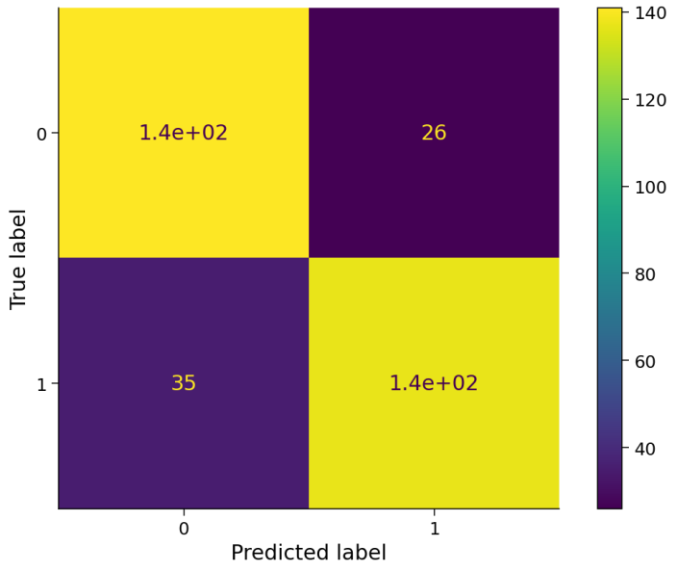


➢ True / Predication

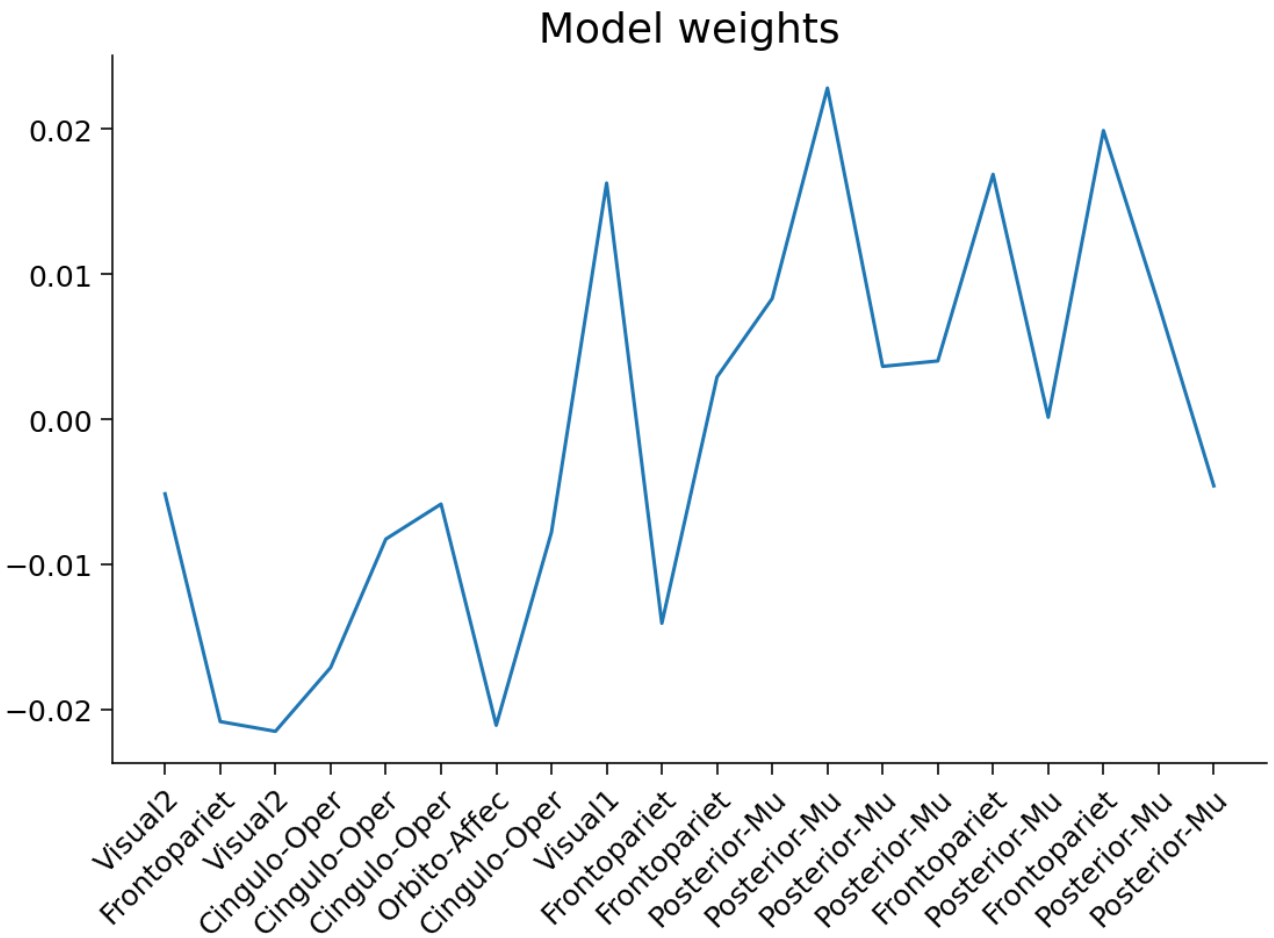
- The 20 parcels give the accuracy of result in amount of 0.76, which is analyzed with Ridge Classifier with 20 cross-validation
- While using the whole 360 parcels with a Logistic Regression model and 20 cross-validation, gave us 0.82 accuracy.
- which is higher than our chosen 20 parcels by 6% only.

0 parcels modeling Vs 360 parcels modeling

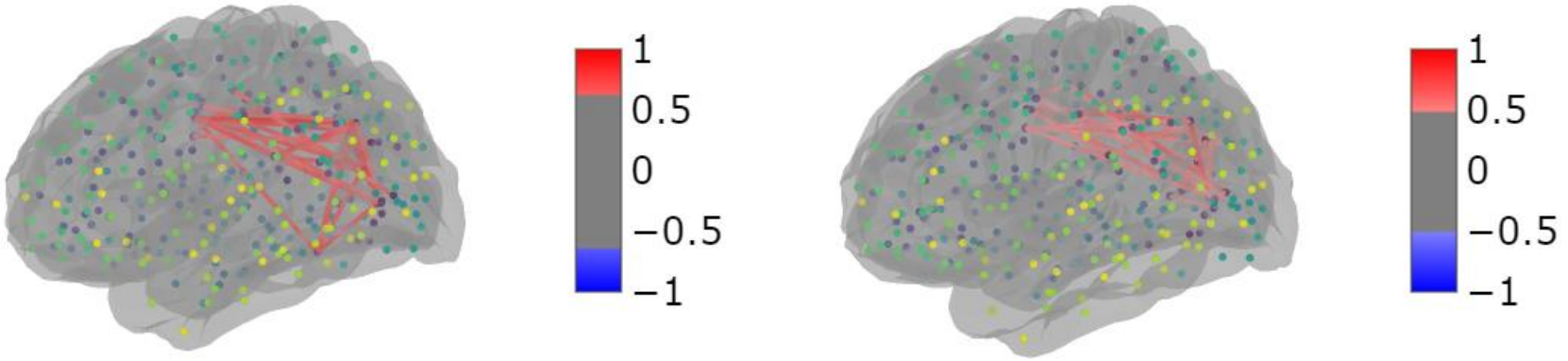




➢ Model weights for the 20 parcels



➢ In the brain



Brain connectivity for Loss & Win

Goodbye now

The universe let us be a human being.
what we do is try to be a good human.

#save_water_resources
#save_Hawizeh_Marshes
#save_ Khuzestan