RSA Assignment
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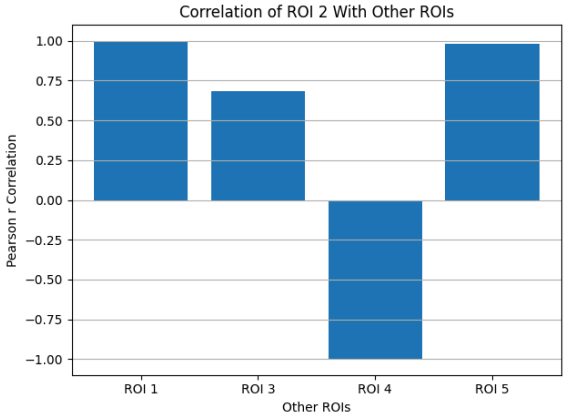
“What do the three values in each ROI vector represent?”

Each ROI contains a set of voxels, and within each voxel is a 3 element response vector, one for each stimulus. So from this vector I extracted a comparison between stim1 and stim2, stim1 and stim3, and stim2 and stim3, comparing the response of each ROI per stimulus to the other stimuli. So, in my code for example, cd12 = how similar/dissimilar the ROI’s response pattern is to stimulus 1 vs stimulus 2, and cd13 equals the same but for stim1 and stim 3, etc.

“Compute the pairwise Pearson correlation between the dissimilarity matrices for each ROI. What is this correlation a measure of?”

The pairwise Pearson correlation (r) is measuring how similar/different each ROI response to stimulus pairings are to each other. So for a high r between ROI 1 and 2 for example, this means that these two regions responded similarly to the stimuli.

Interpretation of Plot:



The plot suggests that ROI2 is highly positively correlated with ROI1 (~1.0) and ROI5 (~ 0.99), moderately positively correlated with ROI3 (~0.65), and strongly negatively correlated with ROI4 (~-1.0).

This pattern suggests that ROI2, ROI1, and ROI5 may belong to a shared functional network which processes the three stimuli similarly. ROI4, however, shows a strong negative correlation which is interesting and may suggest that it involves the inhibition of another related network, or an opposite representational reaction to stimuli..

From what I understand about RSA, these relationships between regions tend to be interpreted as *representations* of stimuli. So being blind to the content of these representations, we can still interpret that the content of ROI4 is highly related to the stimulus images, but is somehow functionally different or distinct - not necessarily inhibiting. In RSA there are n number of qualia to a visual experience, and this may just be highlighting two distinct ones which have different computational structure in how they are stored/processed.

If I had to speculate, I would say that perhaps ROI1, 2, 3, and 5 are related to visual information processing and categorization so things like color, form, texture, outline, etc. and that ROI 4 (since it seems to compile a representation of the stimuli very differently) may be related with another task such as pre-empting motor response. If for example, the task was to view images and press a button when you see x in an image, for all of these stimuli where x was present, there are different representational activities occurring, one which has to do with visual information processing (ROI1, 3, 5, 2) and another with predicting or initiating movement (ROI4). I think that from this limited analysis it is very hard to come up with any specific regions, but with an informed analysis of regions, could be very useful in crafting cognitive schematics for visual qualia.