scienceinthe.cloud

This notebook was great! It is very reproduceable and easy to understand, thanks to the instructions. A brief explanation of what the images mean could make this more useful to lay people or people with different backgrounds (neuroscience vs computer science vs math and so on) trying to use this tool. Running it was straightforward and required very little expertise.

Graph Explorer Write Up

Calculating the mean connectomes was simple enough, as it simply required iterating through each graph and computing a simple average. When thinking about which covariates to use we considered several different ones for their significance given what we know about neuroscience. For example, we believe that cycles present in the connectomes can reveal meaningful circuitry, as circuits like cerbro-cerebellar loops are important to many different cognitive processes, from motor control to language production. We also searched for the largest clique, as we were curious as to how large-scale connectivity looks like across brain regions. Additionally, we used average degree connectivity to take a generalized look at the connectivity of the connectomes

While exploring this we learned about the networkx object and how graphs are stored as a data structure such that they can be easily retrieved and analyzed when necessary. We also learned about different ways graphs can be studied and how information can be derived from the data, using covariates like degree centrality, cycles, and spanning graphs. Once implemented, the spanning graphs lowered the classifier’s accuracy. Largest clique number had almost no impact on the classifier’s ability. We could not get the cycle finding algorithm to work, but we still believe that this could be a useful feature in the classifier. Average node connectivity would likely help the classifier just by the amount of information it provides (similar to adding every pixel as a feature 😊) but when we tried to implement it, it either broke or was taking incredibly long to run.