PSYC 5720 — Computational Neuroscience

Data Exploration Assignment: Final Presentation

February 17, 2023

The overall goal of the data exploration assignment is for you to use a public data set to address a specific hypothesis about how the brain performs computations. Given the time constraints of the class, you are only expected to make progress toward this goal, by pursuing a specific aim that you defined in your proposal.

Your submission will consist of two parts: code in your rivanna project directory, and a 30-minute presentation to the rest of the class to describe your results. The code will account for 30% of the assignment credit, and the presentation for 70%.

Presentation

Each team will present a report on their project in a colloqium format. That is, you should assume that your audience knows very little about your topic, and therefore needs to have the significance of the study and the methods explained at a basic level.

You will need to prepare slides and orally present them. Every member of the group must speak for part of the presentation. The presentation needs to have the following structure:

Introduction

The introductory section of the presentation motivates the rest of the talk. You need to describe the overarching goal/question you are addressing in a way that emphasizes its significance to understanding neural computations and what is known already in the field. You should include enough background information to bring a hypothetical undergraduate who has taken neuroscience up to speed with any specific methodologies or concepts they will need to understand the significance of the research. Explain the question you want to answer and its intellectual merit: how will your analysis help to advance understanding in the field. End by clearly (re)stating your objective.

Methods

Introduce your data set and describe how it was collected and organized. Describe the specific analysis you performed and how it relates to your objectives/aims for the project.

Results

Succinctly describe the results of your analysis. You need to have at least one data figure that your team generated. Axes must be clearly labeled and legible, but you will also need to walk your audience through the figure, explaining what it is showing and how the results relate to the question/hypothesis.

Conclusions

Interpret your results in light of your hypothesis. Describe any limitations or unexpected outcomes, and summarize what the next step would be in addressing the hypothesis or general research question.

Acknowledgments and Discussion

Acknowledge the experimenters who collected the data you used, and any assistance you received from classmates not in your group, and then conclude by taking questions from the class. I expect everyone in the class to ask at least one question during one of the presentations.

Code

Your group's project directory will need to contain a notebook that generates the figure(s) you presented. This notebook must be at the top level of the directory and be clearly named. I will evaluate your submission by executing the notebook, so make sure you can run the notebook from start to finish and get the expected results. Your notebook needs to work for you to receive full credit. I will mostly be evaluating this part of the assignment based on results, but 10% of your score will reflect whether your code is readable and appropriately documented.