Final Projects

Your final class projects will be to extend, modify, or reengineer the models of decision making and/or learning described over the course of the semester. These projects can take multiple forms, including, but not limited to:

- Showing how a cognitive model and a neural model are linked across levels of analysis.
- Extending a cognitive or neural model beyond the scope described in class (e.g., an accumulator with more than two choices, an attractor model that learns over time).
- Testing a model in a novel context or task not described in class or the readings (e.g., Q-learning in volatile environments).
- Presenting a completely novel model at one level of analysis (e.g., a new accumulator model, a novel learning problem).

Project formats

The final project should be turned in as a Jupyter notebook. Use markdown text to elaborate on the conceptual content. Use code cells to present your results.

The final document should have the following content sections:

- Background
- Problem
- Model
- Results
- Conclusions & Interpretations

There is no length requirement for the notebook, but provide sufficient detail to describe the project to a lay person.

Project presentations

The final two weeks of classes (before finals week) will be reserved for presentation of the final projects in class. Each project team (or individual) will get 15 min to present their work by walking through the notebook and answering questions.

Deadlines

- Oct. 19th, 2021: Presentation of project idea in class. 5 min.
- Nov. 2nd, 2021: Outline of project idea submitted to instructors via Canvas. This is a brief write-up of the proposed project (500 words max, figures & equations are recommended).
- Nov. 23rd, 30th & Dec. 2nd, 2021: Final project presentations in class.
- Dec. 7th, 2021: Final Jupyter notebook of the project submitted to instructors.

Student:		
Title:		
		Points
Background & Problem (25pts)	**(Clearly define big picture and hypothesis)**	**25**
	Introduction establishes the broad relevance of the problem. Why should someone care?	
	Language that is specific to the presenter's subfield is defined appropriately for a general audience of scientists.	
	The logic and key details of the experimental design are clear. If the data were otherwise acquired (e.g., opportunistic sampling, big data), then the relevant details of original data acquisition are clearly presented.	
	The motivation for the hypothesis is clear.	
	The hypothesis is clearly defined.	
Model (25pts)	**(State the form of your model)**	**25**
	What is the functional form of your model? How does it work?	
	Are all variables and equations clearly defined?	
Results (20pts)	**(What was found? How can we see it?)**	**20**
	Graphical integrity. Are plots clear and communicating results accurately & effectively?	
	Is the model evaluated in a way to meet the hypothesis defined in the beginning?	
	Are the tests of the model rigorous (with regards to the main hypothesis posed)?	
	Are the results clearly summarized verbally?	
Conclusions & Interpretations (20 pts)		**20**
	Show that the interpretation demonstrates a basic understanding of the techniques used.	
	Show that the interpretation of the resutls respects the limitations of the model.	
	Is the interpretation thorough (e.g., must explain directionality and size of the effects, if appropriate, instead of simply stating significance)?	
	Do the conclusions link to the introductory context and hypothesis?	
	Do follow-up questions/analyses logically follow from the current results?	
General Comments (10)		**10**
	The notebook itself draws on relevant formatting features for clear presentation (markdown, sectioning).	
	The functional form of the models used to evaluate the hypothesis is explicitly written.	
	Variable names have clear meanings. The analysis is generally clearly implemented and code is intuitive to follow.	
	The language used to scaffold the presentation is concise but descriptive enough to convey the main points of the presentation.	
	Each step well-justified and remains faithful to the variability present in the data (i.e., no removal of data without a well-reasoned justification).	
	Data is shown to be stored in raw form and processed form.	
Grade		**100**