

## Assignment 2

In this assignment, you will create a program to record psychophysical data. Specifically, we will test hypotheses that the perceived color of the “dress” stimulus varies as a function of some physical image characteristic such as brightness, blur or size. Pick one of these, don’t do all three. Do state the specific hypothesis in the header, just to be clear. You can assume that the dress image is called (`thedress.jpg`) and located in the same directory as the code.

Specification of the tasks that the script needs to be able to do (1 point per spec):

- 1) **Load the dress image into a matrix, then create 11 alternate versions of the stimulus, in the dimension of interest.** For instance, if you are interested in whether the perceived color of the dress varies as a function of brightness, you should create 11 versions of the dress in addition to the original that differ in terms of their overall brightness level (spanning a reasonable range, including versions that are darker). The reason we are interested in 11 versions is that we would like the psychometric curve (that we will use to create from this) to have a midpoint.
- 2) **Present the stimulus in a configuration where the original dress is side by side with an instance of a modified one**, e.g. the original is left and a slightly brighter version is on the right. A small (but visible), red fixation cross should be in the very center of the display. The original version should have an equal chance of appearing on the left or on the right side.
- 3) **Implement the method of constant stimuli.** Specifically, present the 11 displays that you created in 2), in random order, 10 times per condition, for a total of 110 trials. In each trial, the participant should indicate which version of the dress appears to be more “blue” (left or right) to them. Make a reasonable decision about how long you want to show the dress for, and how long much time you want to give the participant to respond (can be indefinitely long, until participant makes a response). Make sure to also capture the reaction time each trial.
- 4) **Calculate the mean proportion of “blue” choices as a function of condition.** This presumes that you parse the responses of the participant. For instance, say the original image of the dress is presented side by side with a slightly brighter version. If the original image is presented on the left, and the participant responds that the blue-er version is on the left, then this counts as a 0 (the modified version was not seen as blue). If the original image is presented on the left, and the participant responds that the blue-er version is on the right, this counts as a 1 for this brightness condition. Make sure to randomize the position of the original image in 2), otherwise you have a confound and potential for bias. To calculate the mean per condition, you can simply use the *mean* function.
- 5) **Plot a psychometric curve and save the workspace.** Make a figure where the mean proportion of responding “blue” is plotted on the y-axis as a function of the physical characteristic (the 11 conditions) on the x-axis. Also, make sure that the script saves the workspace capturing the responses of the participant. We might need it later.