

Rainbows Revisited: Modeling Effective Colormap Design for Graphical Inference

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-Supplementary Materials-

The supplementary materials package includes two things:

1) Experimental data ('data' folder):

- **data_exp{1|2}.csv:** The raw (per trial) responses provided by subjects in experiment 1/2. Every row represents one trial containing the following columns:
 - subjectid: a unique ID for each subject
 - responseid: a unique ID for each trial
 - block: block number (ranges between 1-4)
 - stimulus: stimulus number (ranges between 1-88 in the first, or 1-96 in the second experiment)
 - trial: trial number (within block)
 - colormap: the colormap used in the trial
 - hasDecoy: whether the lineup included decoy visualizations (always 1 in the first experiment, but can be 1 for true positive or 0 for true negative in the second experiment)
 - distance: KL divergence between the target and decoy model
 - requestedDistance: KL divergence requested by the sampling procedure (this should be very close to the 'distance' field with minor variation)
 - correct: whether the subject had answered correctly
 - selection: the quadrant selected by the participant (1=top-left, 2=top-right, 3=bottom-left, 4=bottom-right, or 99="no difference" between the visualizations in the second experiment).
 - responseTime: time it took subject to respond to stimulus (m. seconds)
 - generationTime: time it took the interface to randomly generate the lineup (m. seconds)
 - Design: the design family for the colormap of this trial (can be single-hue, multi-hue, divergent, or rainbow).
 - Name Length: *color name variation* for the colormap used in this trial
 - LAB Length: the length of a colormap's curve, measured in the CIELAB.
- **demographics_exp{1|2}.csv:** demographic data. Each row contains information about one subject. The columns are:
 - subjectid: a unique subject ID (cross-referenceable with *data.csv)
 - gender, age, education: self-reported demographic data
 - comment: an optional comment field
 - signuptime, finishtime: a timestamp of the moment a subject had signed up for or completed the study.

- **strategies_exp{1|2}.csv:** Contains the strategies participants self-reported to be using. Each row represents the strategy described by one subject. This data was un-analyzed in the current study, but we provide it nonetheless.
- **analysis_exp{1|2}.R:** R code for modeling and running the statistical analyses in experiment 1/2.

2) Experimental Interface:

The experimental interface seen by subjects is included in this folder. The interface should run within any WebGL-compliant web browser. To launch, open **START_HERE.html**.