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Area MT and Motion Perception

BIOENG 1586

Spring 2017

Problem 1

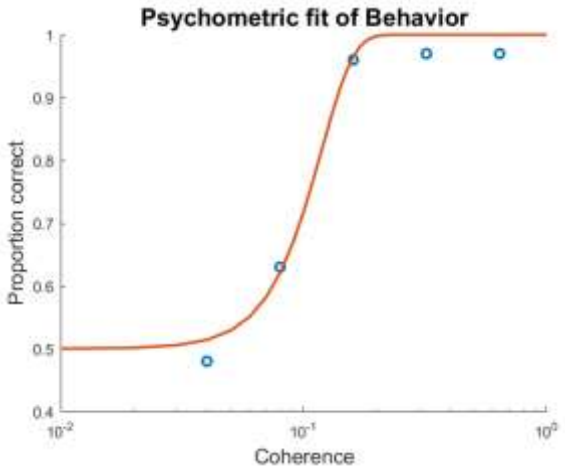


Figure 1. Psychometric (Weibull) fit of monkey's behavioral data on rightward trials only (α_{est} = 0.1185, β_{est} = 3.2664).

Problem 2

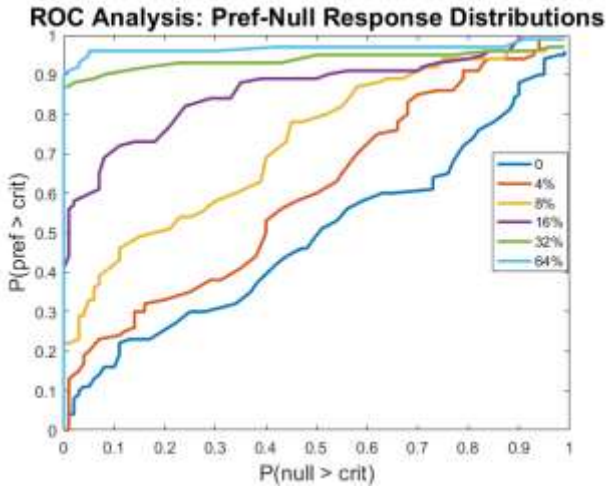


Figure 2a. ROC analysis of neural responses from the neuron of preferred direction (vertical axis) and null direction (horizontal axis) at each of six coherence levels (individual lines).

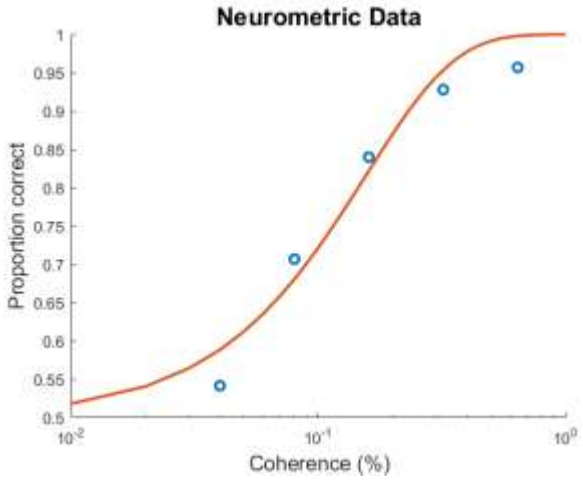
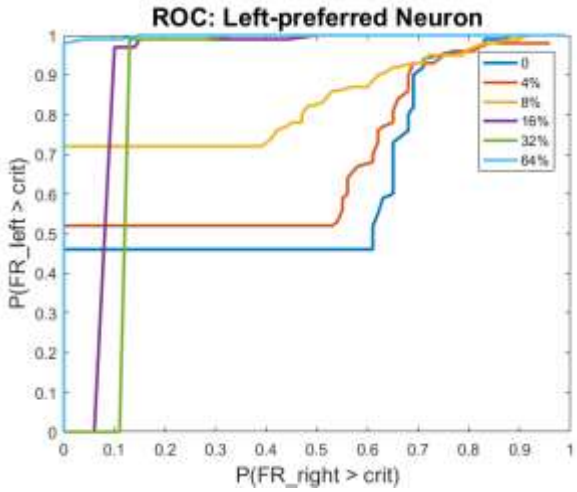
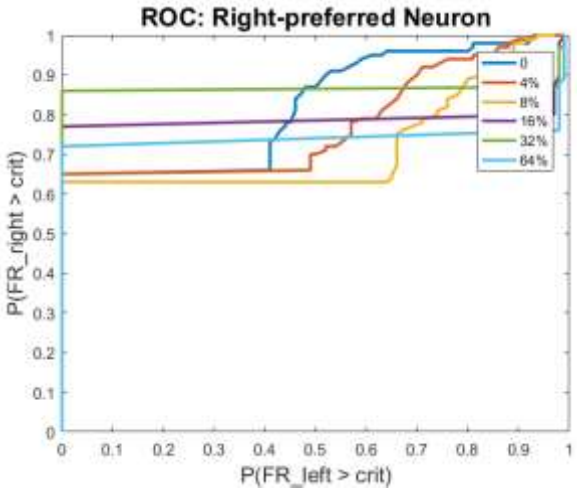


Figure 2b. Neurometric (Weibull) curve constructed from the pair of neurons (α_{est} = 0.1559, β_{est} = 1.2026). Individual points are normalized area under the curve calculations from each coherence ROC curve.

Problem 3





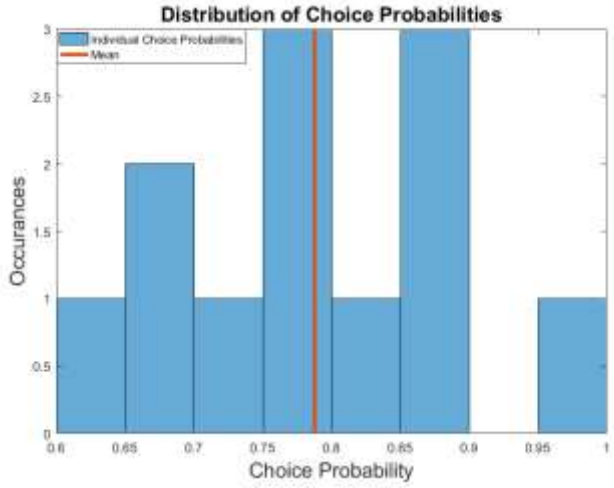


Figure 3. (Above) ROC curves for the firing rate of leftward and rightward tuned neurons in preferred and null decisions. (Left) Distribution of choice probabilities calculated as the area under the ROC curve for the two neurons across the six coherence conditions (12 total occurances). The mean of the distribution lies at 0.7877 (red line).

Problem 4

Yes, the monkey has an internal bias to his choices. The monkey is biased 10% in the leftward direction. The monkey's proportion of rightward choices on 0% coherence is 40%, whereas an "unbiased" monkey would select left and right equally likely for the 0% coherence trials.