

Exercises Lecture 4

1. What is the general equation for the response distribution (assuming some deterministic decoder) in terms of the posterior distribution?
2. Work out a case where the posterior distribution and the response distribution are both continuous but very different from each other. (For example, choose non-Gaussian distributions and/or a more complex generative model.)
3. Do the same when the stimulus variable is discrete, for example binary.
4. Bonus: make as general as possible the conditions under which the variance of posterior and response distribution (both continuous) are the same.
5. Even when a single stimulus has to be inferred from a single cue, a bias can arise due to a prior. Assuming a Gaussian noise model and a Gaussian prior (with specified mean and variance), compute the bias as a function of the stimulus.

In preparation for Small Project 1, read <http://mambo.ucsc.edu/psl/data/mass93a.html> and start thinking about a plan for how to model these data.