

Week 5 (Mon 4/27)
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Pestilli et al. tried to understand the changes to cortical activity that are induced by spatial attention. They designed an experiment in which attention could either be *focal* or *distributed* to one or four targets respectively. They recorded behavioral performance on a 2-interval contrast discrimination task as well as cortical responses via BOLD imaging. They then looked at what models might be sufficient to explain the variance in behavioral performance through the changes in variance of the cortical responses. They found that the magnitude of the change in behavior was too large to be explained by a change in cortical responses, and indeed their cortical responses were too small to explain their behavioral results. They show that instead a two stage model in which attention acts to modify a “max()” operator function does explain their results, as well as a curious finding that high-contrast distractors were severely detrimental to performance. They conclude that attention may act in task or feature dependent manners throughout cortex, helping to explain the variability in computational models used in the literature to explain changes in performance due to attention.

One question that comes to mind is whether this computation is consistent both for spatial attention and for feature-based attention. A claim could be made that, because this paper doesn't test for differences in feature-based attention, that we are actually seeing feature-based attention that is being localized differently across conditions. It would be interesting to dissociate spatial and feature-based attention directly by crossing them in an experiment.