Week 3: Writing Assignment

Answer one of the following questions based on this week's material (one-page typewritten response, double-spaced, due Friday 04/23/10).

- Summarize behavioral and neurophysiological evidence that supports the hypothesis that attention modulates sensory processing by selectively altering effective stimulus contrast.
- The effects on V4 neural response of attending to a target instead of a distractor outside the receptive field (RF), compared to attending to a target when both target and distractor are inside the neuron's RF, are different. Describe this difference.
- What is surround inhibition? Is the suppressive effect of a surround stimulus strongest or weakest when it is of the neuron's preferred orientation? How is this similar or different from the contrast-dependent interactions when both stimuli appear within the classical receptive field?
- What is the evidence that frontal eye field (FEF) may mediate attentional effects on V4 tuning curves by effectively modulating contrast sensitivity?
- Summarize the evidence that feature-based attention, in addition to space-modulated attention, modulates V4 neural responses.

Extra credit (one paragraph, due Friday 04/23/10, up to 20% bonus).

- Describe two theoretical reasons why the effect of contrast and attentional modulation should be multiplicative scaling instead of sharpening of the tuning curve.
Representation of Value in the Brain

- “Matching behavior and the representation of value in the parietal cortex” (Sugrue, Corrado, Newsome, *Science*, 2004)
- “Distributed neural representation of expected value” (Knutson et al, *J. Neurosci*, 2005)