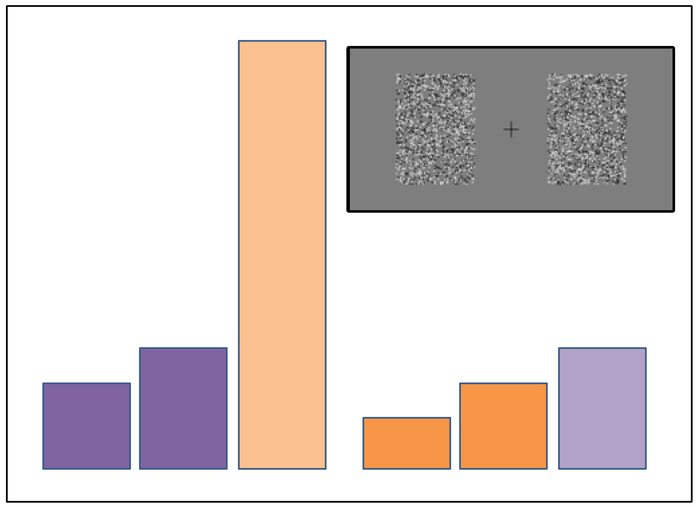
Neural Substrates of Attention and Awareness

Asymmetrical Behavioral Effects of Feature-Based Attention Are Predictable from Neural Architecture

GRU .stanford.edu

Daniel Birman, Justin Gardner
Department of Psychology, Stanford University
dbirman@stanford.edu

Behavior

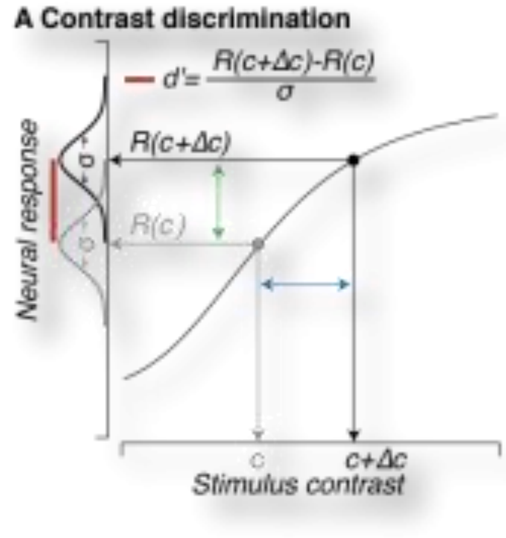


Contrast Performance Motion Performance

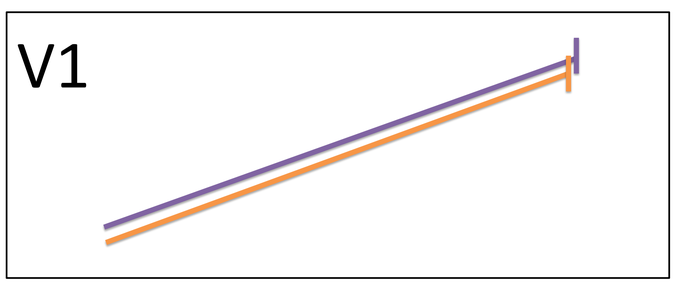
Participants were asked to estimate which of two dot displays had higher contrast or motion coherence. Threshold performance is shown (higher values indicate worse performance).

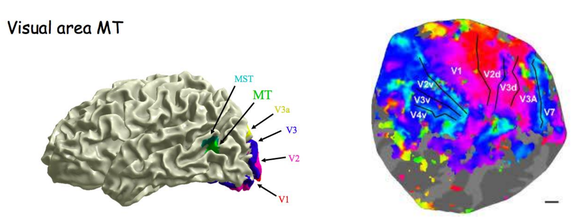
Paying Attention to **Contrast** Asked to Respond about **Contrast**	Paying Attention to **Motion** Asked to Respond about **Contrast**
Paying Attention to **Motion** Asked to Respond about **Motion**	Paying Attention to **Contrast** Asked to Respond about **Motion**

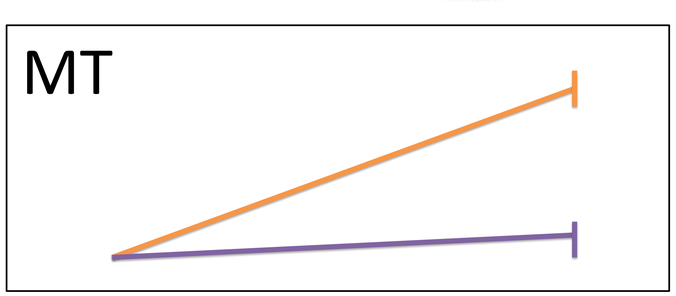
Model of Behavior



Neural Data







We observed an asymmetry in how attention to contrast and motion interact in the visual system. Data recorded from fMRI sessions suggests that attention to contrast inhibits the representation of motion in area MT, but that the reverse is not true.

In future work we will investigate whether this hierarchical relationship is a general feature of the visual system.

Hierarchical Explanation