Abstract:

In order to prioritize the perception of behaviorally relevant stimuli, observers can increase their sensitivity to particular visual feature values (such as colors, orientations, or motion directions). This top-down modulation of visual sensitivity is called feature-based attention. I will present two psychophysical experiments that investigated how feature-based attention influences sensitivity across the visual field. First, I will describe a behavioral correlate of a phenomenon first reported in physiology: feature-based attention spreads across hemifields to locations unrelated to the primary task at hand. In the second study I examined more specifically how feature-based attention interacts with covert spatial attention. The two systems enhance visual signals in an independent and roughly additive fashion. However, when there is competing information in the display, the two cueing effects interact, such that the benefit for attended features is greater at attended than unattended locations, and the effects of spatial attention are stronger for attended than unattended features.These findings narrow the gap between our knowledge of neurophysiology and perception, and establish how basic visual mechanisms adapt to the observer’s goals. Understanding the processes of attentional selection like these helps explain the incredible visual capacities we rely on in complex environments, as well as our perceptual limitations.