

We developed and tested a powerful method for identifying and characterizing the effect of attention on performance in visual tasks as due to signal enhancement, distractor exclusion, or internal noise suppression. Based on a noisy Perceptual Template Model (PTM) of a human observer, the method adds increasing amounts of external noise (white Gaussian random noise) to the visual stimulus and observes the effect on performance of a perceptual task for attended and unattended stimuli. The three mechanisms of attention yield three \blacklozenge signature \blacklozenge patterns of performance. The general framework for characterizing the mechanisms of attention is used here to investigate the attentional mechanisms in a tilted slightly to the right or left - always appeared on both the left and the right of fixation, and varied independently. Observers were cued on each trial to attend to the left, the right, or evenly to both stimuli, and decide the direction of tilt of both test stimuli. For eight levels of added external noise and three attention conditions (attended, unattended, and equal), subject \blacklozenge s contrast threshold levels were determined. At low levels of stimuli were systematically higher than for equal attention stimuli, which were in turn higher than for attended stimuli. Specifically, when the rms contrast of the external noise, attention conditions did not affect threshold contrast values at all. These strong results are characteristic of a signal enhancement, or equivalently, an internal addition noise reduction mechanism of attention.