- Friday, October 8, 2004
  Visual cortex mechanisms for processing moving contours defined by texture or contrast

  In the natural world we routinely perceive objects which are distinguished from their backgrounds by global differences in local attributes such as luminance, contrast, texture, etc. Visual cortex mechanisms selective to motion of oriented contours defined by luminance differences are relatively well known, but only recently have we begun to understand a parallel set of mechanisms sensitive to differences of contrast or texture. Neurophysiological studies in early visual cortex reveal that many single neurons are selective to both local textural and global contour attributes of visual stimuli, while optical imaging demonstrates coarse-scale anatomical compartments for contour properties which are largely invariant to texture attributes. Computational analyses of natural image statistics, based on models derived from neurophysiology, indicate scale-invariance of textural information in natural images, and its co-occurrence with luminance-defined information.

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