

ECVP 2000 abstract

Shadows are fuzzy and straight; paint is sharp and crooked

E H Adelson, D Somers (Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, NE20-444H, Cambridge, MA 02139, USA; fax: +1 617 253 8335; e-mail: adelson@psyche.mit.edu)

Brightness illusions typically involve cues for lightness constancy. Evidently, the process of discounting illumination can cause identical grey patches to appear different. The visual system can utilise various cues to distinguish illumination variation (shadows) from reflectance variation (paint). For example, fuzzy edges are likely to be shadow, and fuzzy transitions can support strong illusions. Similarly, White's illusion depends on T-junctions, and the Ts arguably provide evidence for an illumination edge.

We now report a new cue. Contour straightness can strongly affect illusion strength; we propose that crookedness vs straightness is a cue for paint vs shadow. We do not claim that shadows in nature are usually straight; rather, we claim that the visual system 'believes' that they are.

We have modified White's illusion to retain the Ts but not the straight contours; the illusion is decreased. We have put straight and crooked contours in direct competition by crossing them to form plaids; the straight components dominate the illusions, indicating stronger discounting. We have studied the role of straightness in the snake and anti-snake illusions. Finally we have combined cues to produce remarkably strong brightness illusions.

© 2000 Pion Ltd

Adelson, E. H. and Somers, D.C. (2000) Shadows are fuzzy and straight; paint is sharp and crooked. European Conference on visual Perception 142