Motion without movement

The basic idea



1-d cross-sections of filters. (a) Even phase (G_2). (b) Odd phase (H_2). (c) Filters modulated in phase. Note the apparent rightward motion of the filter ripples.

Image of Einstein



(a) and (b): G_2 and H_2 filters were applied to an image of Einstein. (c) Image phase modulated as above. When viewed as a temporal sequence, this generates the perception of rightward motion, yet image remains stationary.

Steerable filters conveniently allow this illusiory motion effect to occur in any direction, just by changing the orientation of the quadrature pair of filters.

Reference

W. T. Freeman, E. H. Adelson, and D. J. Heeger, *Motion without movement*, ACM Computer Graphics, vol. 25, no. 4, (SIGGRAPH '91), pp. 27 - 30, July, 1991.

B. Cabral and L. Leedom, *Imaging vector fields using line integral convolution*, ACM Computer Graphics, vol. 27, no. 4, (SIGGRAPH '93), pp. 263 - 272, July, 1993.

D. Stalling and H-C. Hege, *Fast and recolution independent line integral convolution*, ACM Computer Graphics, vol. 29, no. 4, (SIGGRAPH '95), pp. 249 - 256, August, 1995.