2018-03-12 Motion

PSY 525.001 • Vision Science • 2018 Spring

Rick Gilmore

2018-03-11 17:57:53

Today's topics

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Motion

Motion detection

Sources & Types of motion

Physiology of motion

Sources & Types of Motion

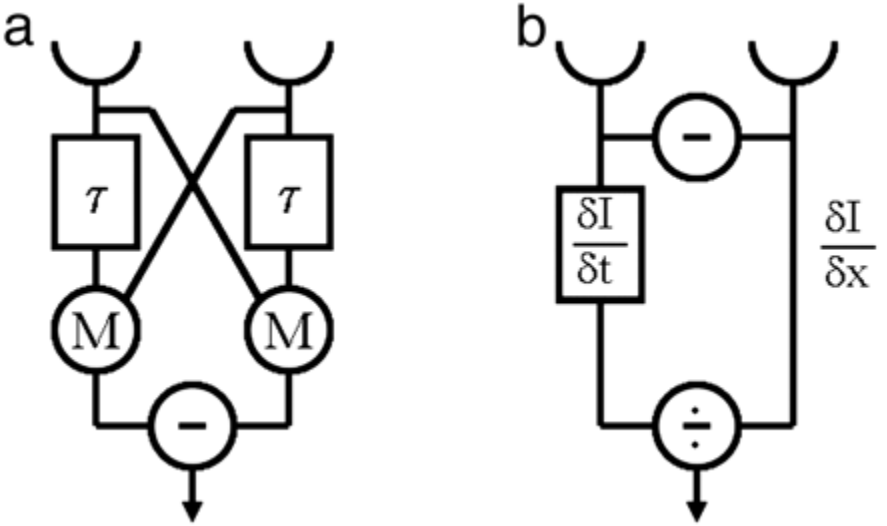
Source: Object vs. Self

Direction, speed, type

2D form from motion

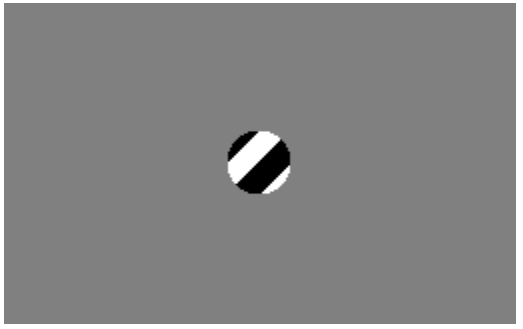
Speed = Distance/Time

Motion -> Change in Luminance/Time

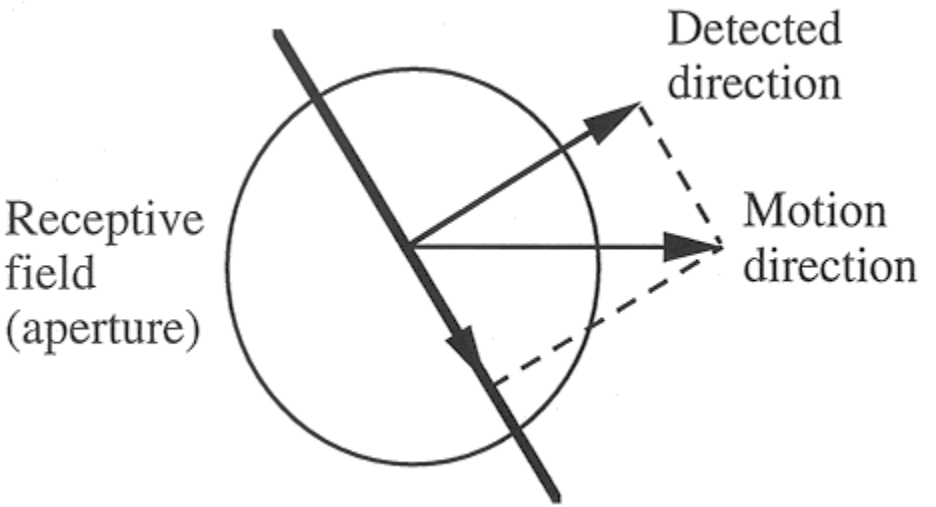


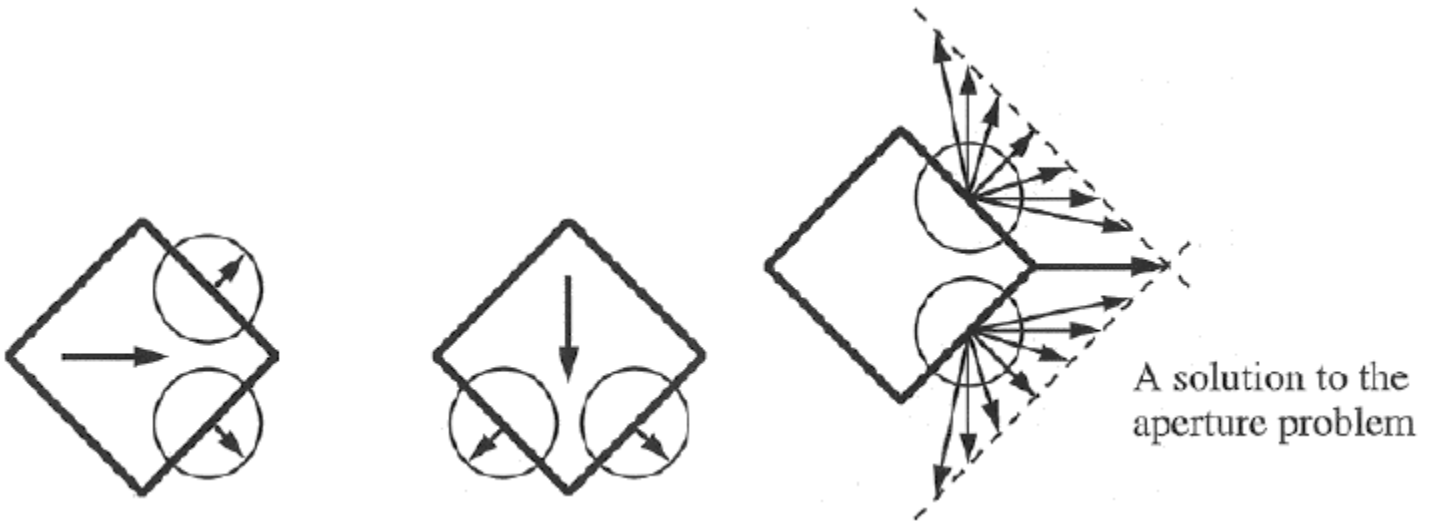
(Werner) Reichardt detector

Motion detection, integration



Aperture problem

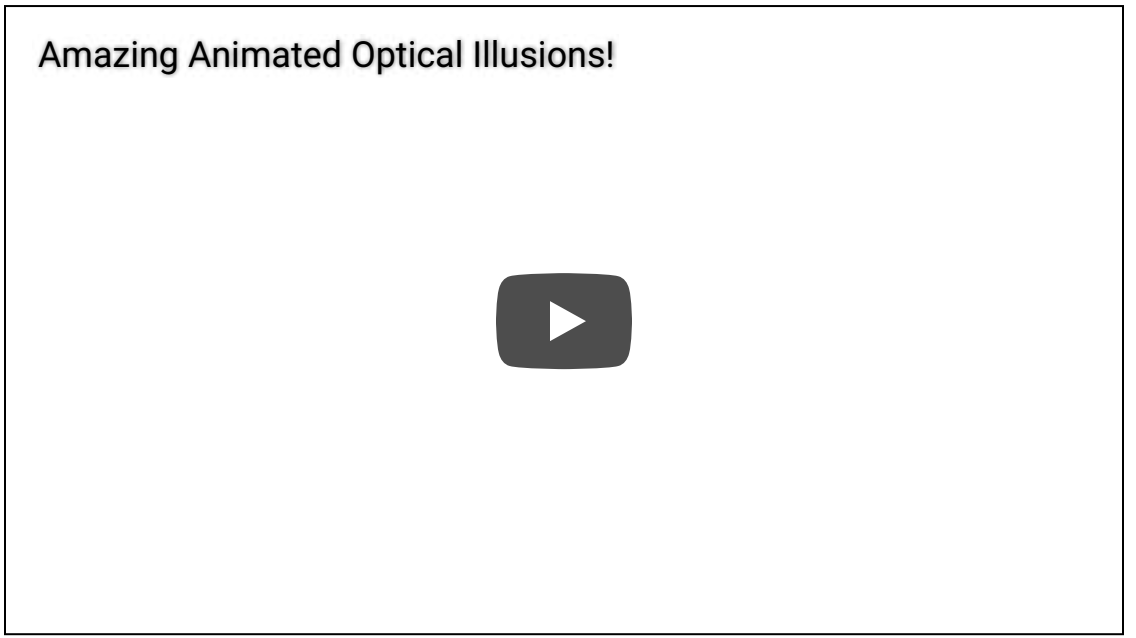




http://fourier.eng.hmc.edu/e180/lectures/motion/node11.html

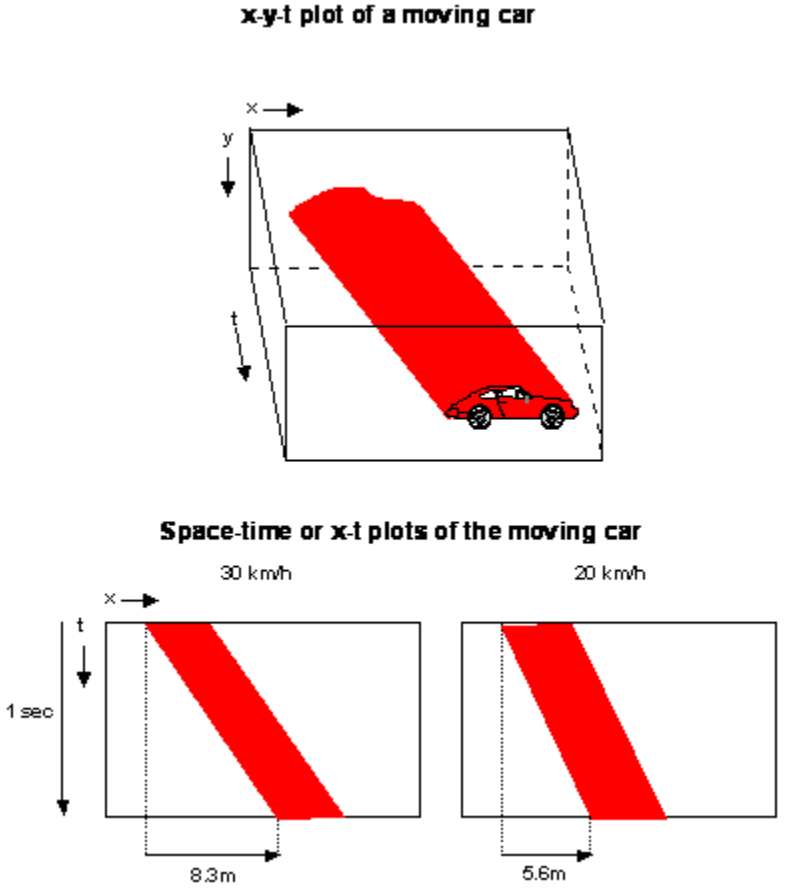
By Copied from the very nice animation at Image:Phi_Phenomenon.gif, but with the watermark with the image author's name removed in accordance with [1] - English Wikipedia The original file was upload by English-Wiki user Cromis, CC BY-SA 3.0, Link

Apparent motion



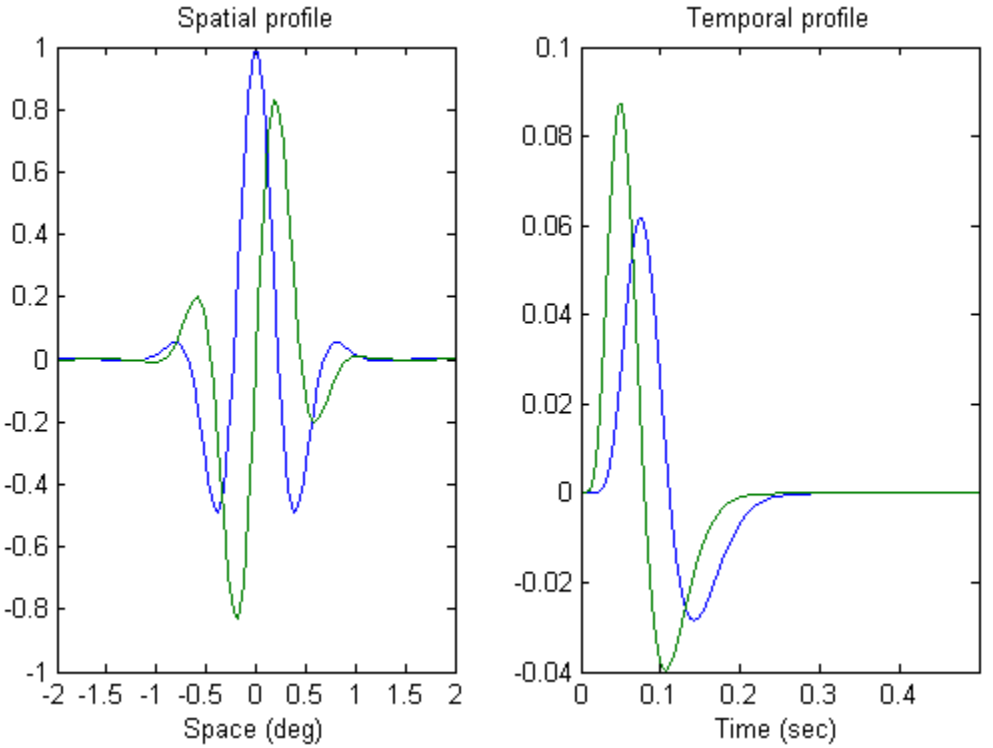
Motion from static samples smeared in space

How to make Animated Illusion



http://www.georgemather.com/Model.html

Motion Energy Filters (Adelson & Bergen, 1985)

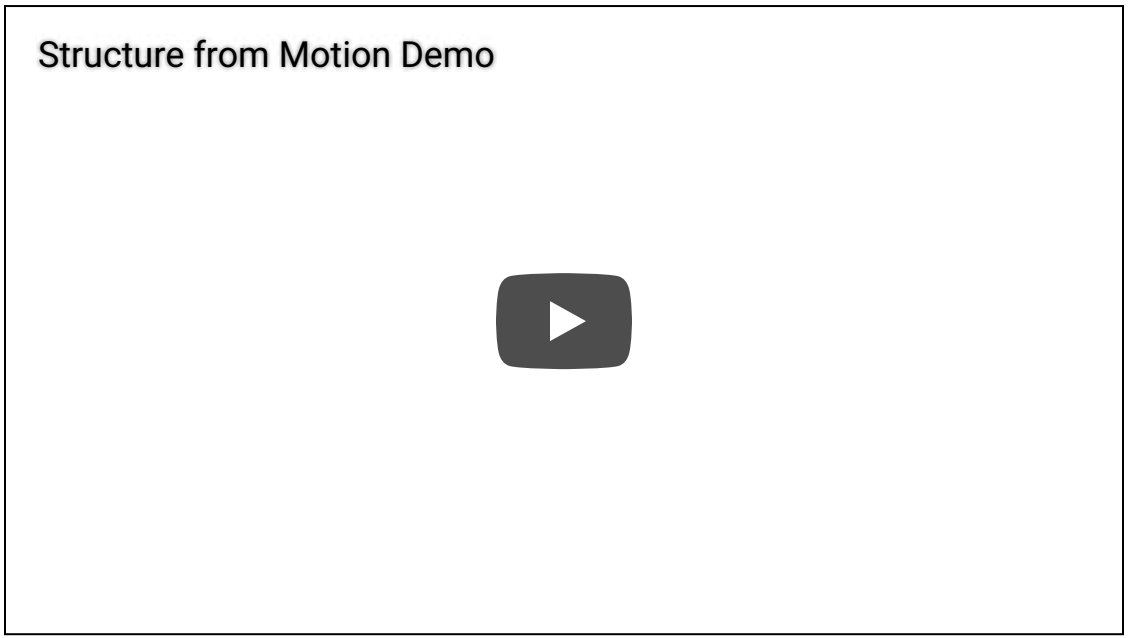


http://www.georgemather.com/Model.html

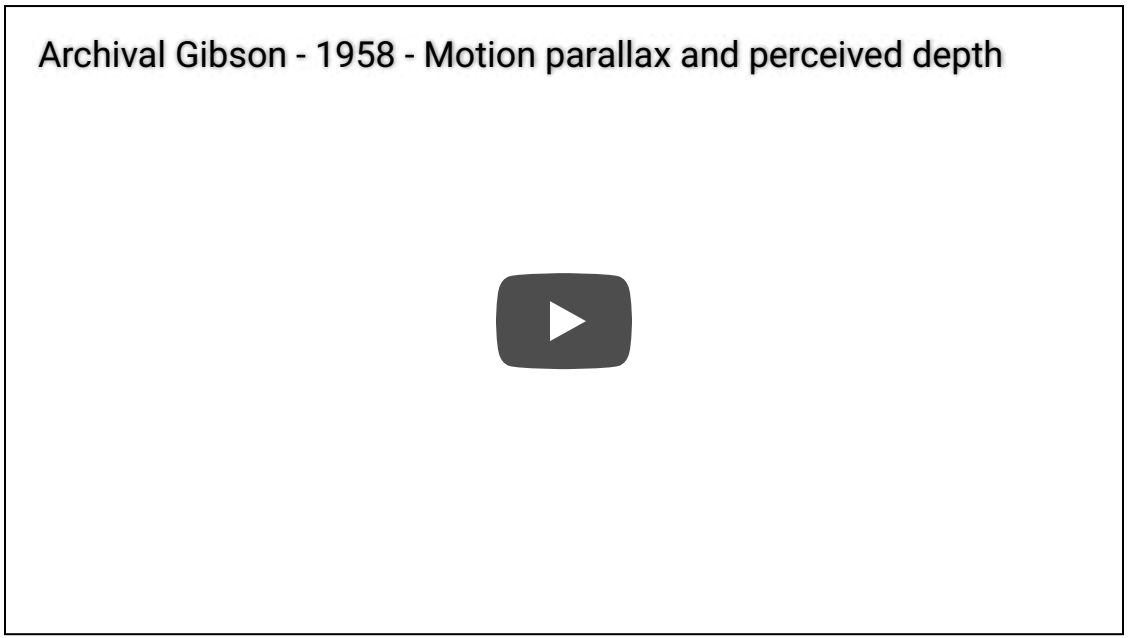
Speed/direction are slopes in space-time

Anomalous motion illusions

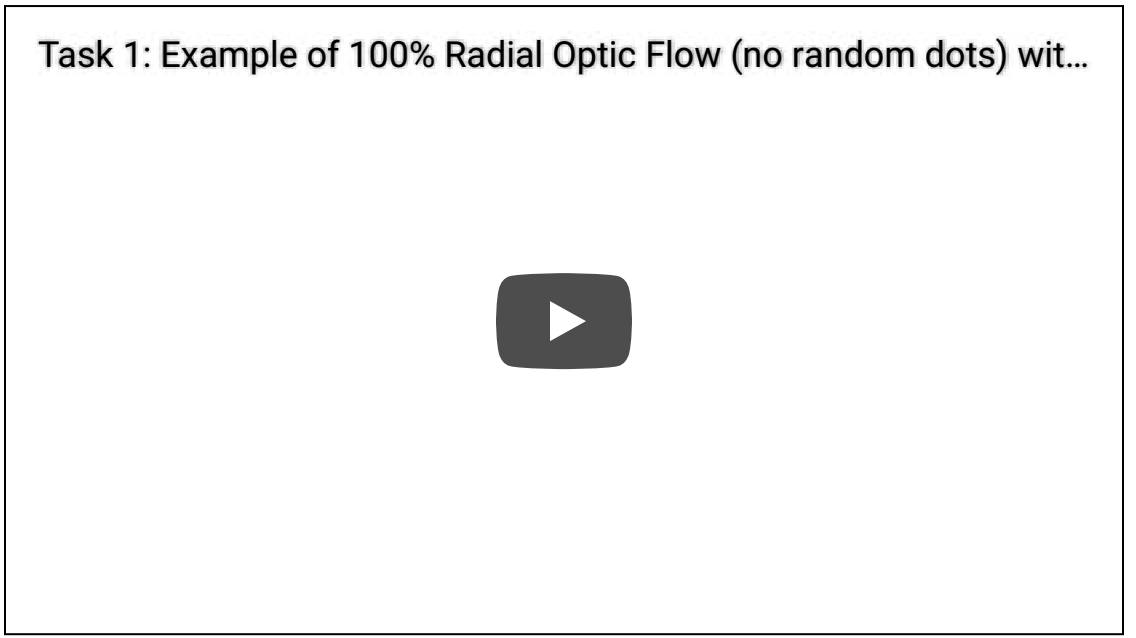
Flipbooks



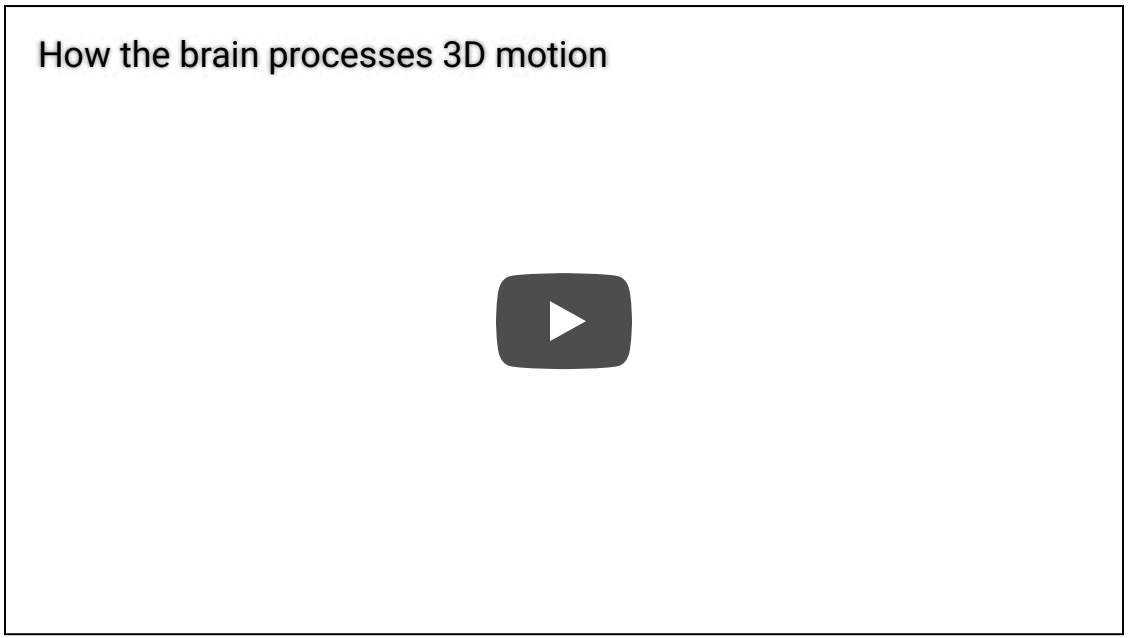
Structure from motion



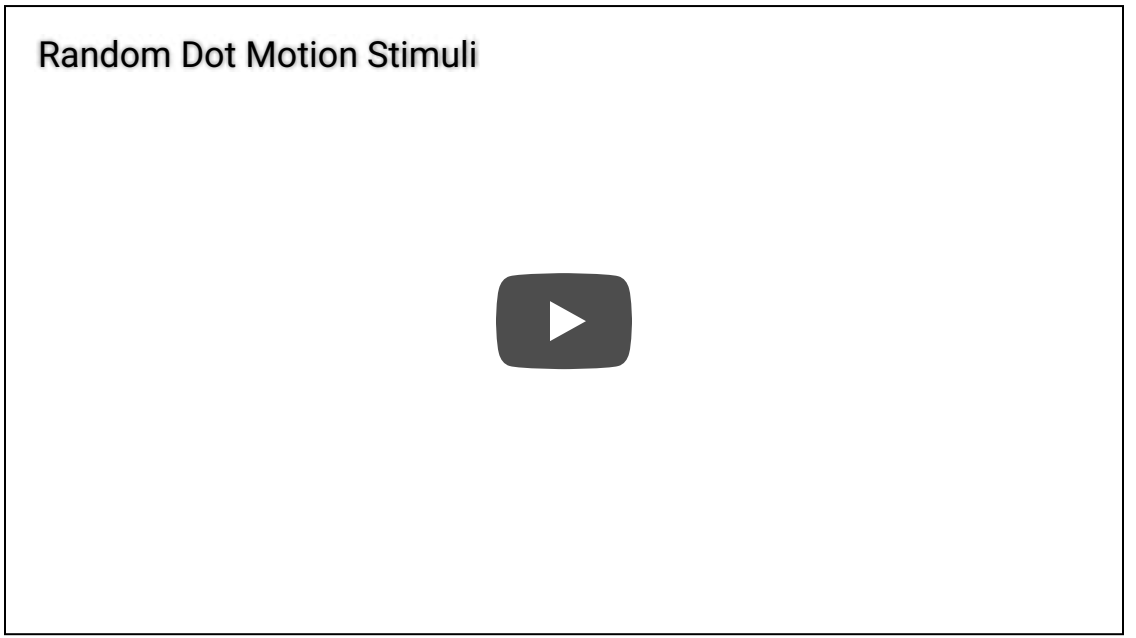
Motion parallax specifies relative depth



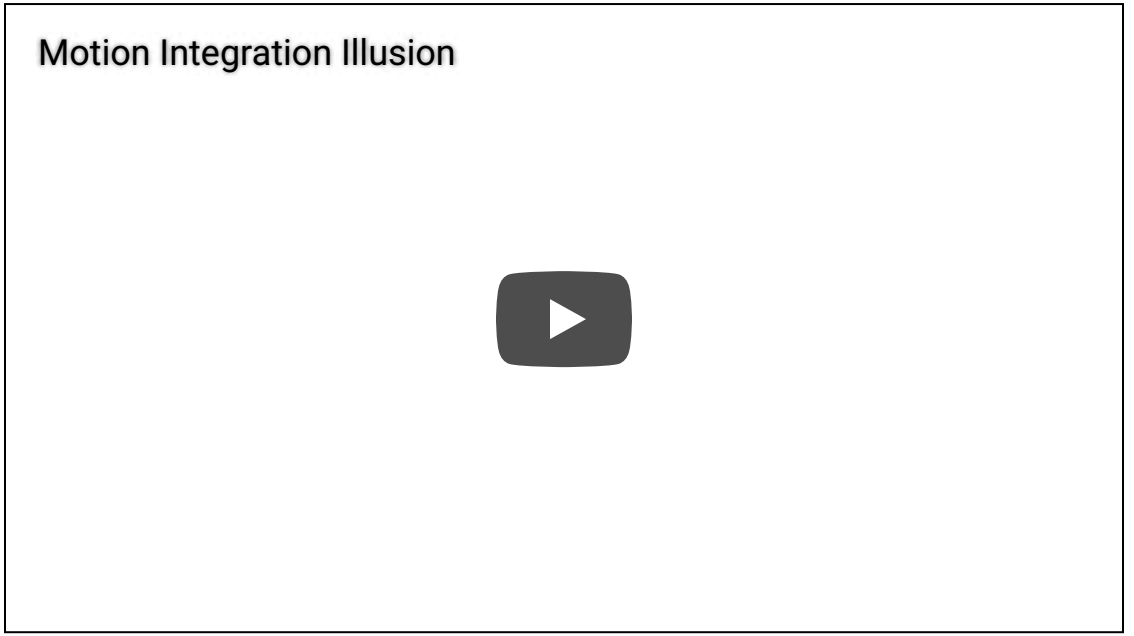
Optic flow specifies observer motion



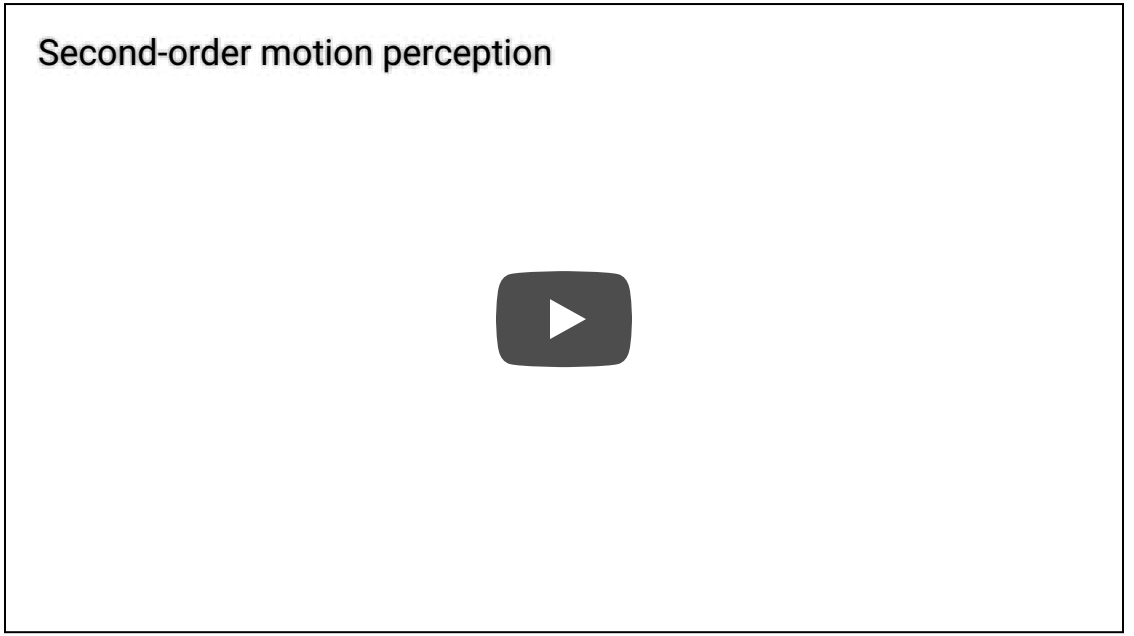
Binocular motion signals and 3D perception



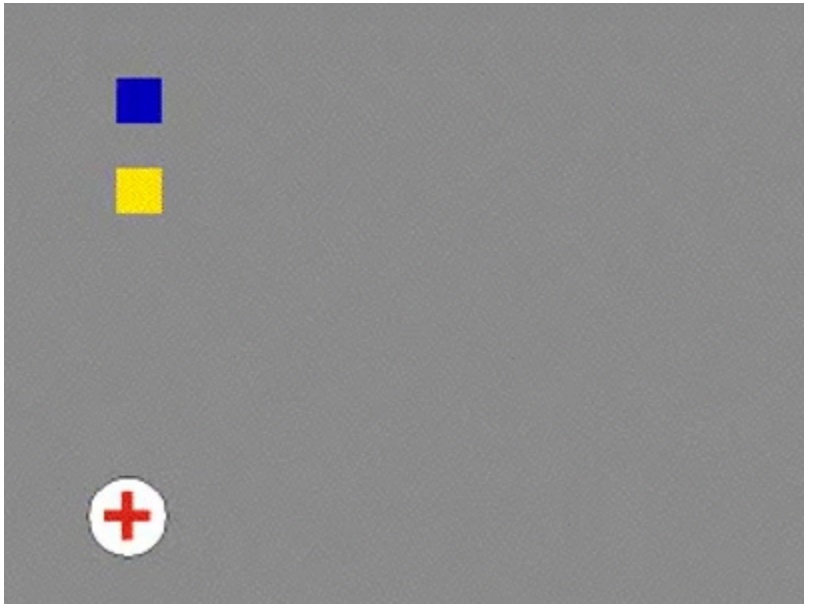
Random dot kinematogram (RDK) motion parameters



Motion integration

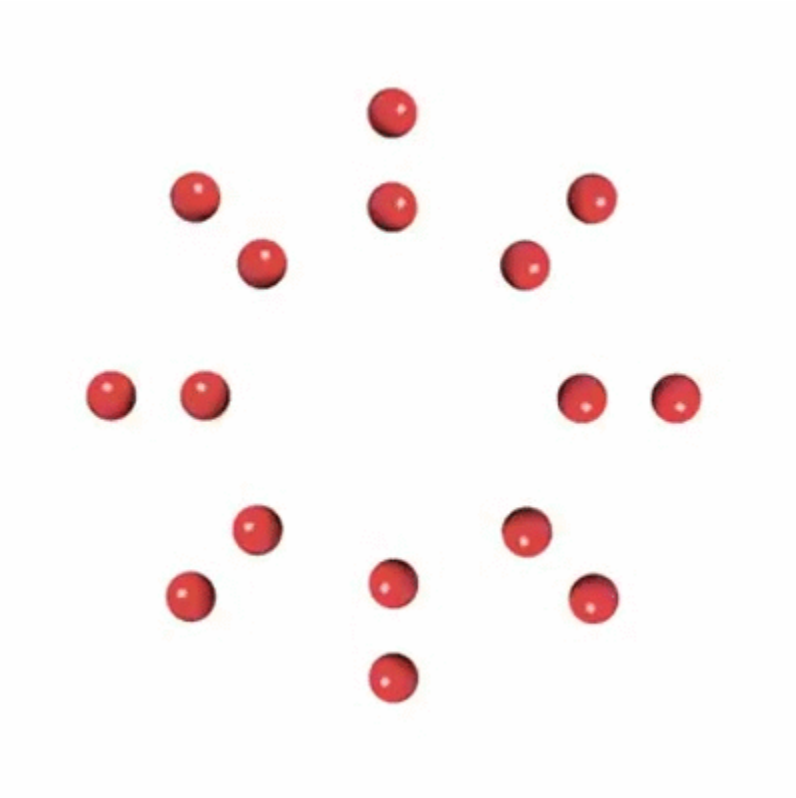


Second-order (changes in contrast, texture, etc.) but not overall luminance

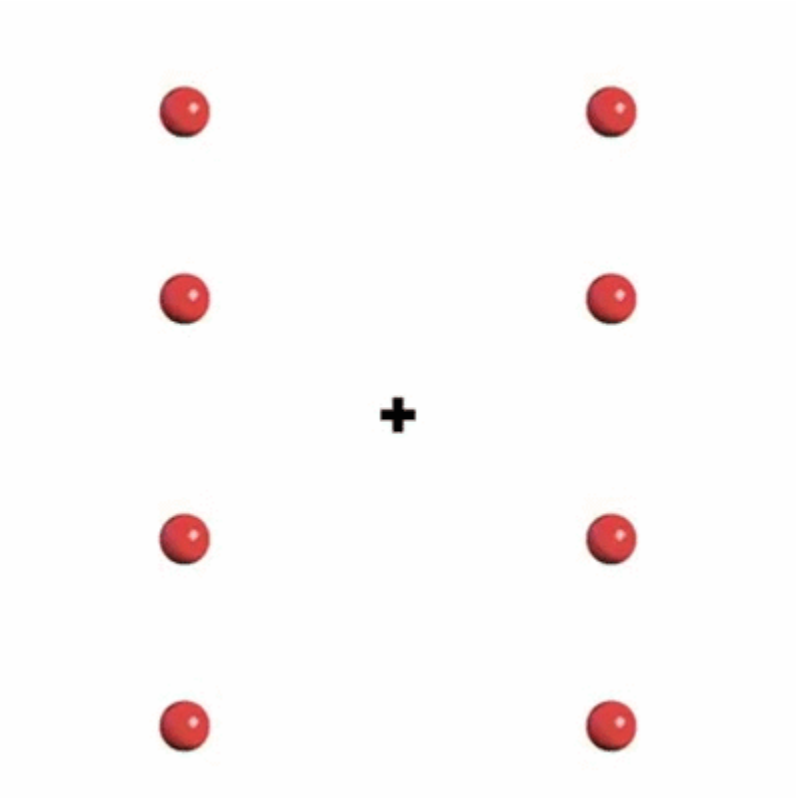


Relative contrast matters

Context effects Anstis, 2015



Grouping effects Anstis, 2015



Grouping effects Anstis, 2015

PsychoPy, http://www.psychopy.org/

Matlab Psychophysics Toolbox,
http://psychtoolbox.org/

Break

Johansson, G. (1973). Visual perception of biological motion and a model for its analysis. *Perception & Psychophysics*, *14*(2), 201–211. Springer-Verlag. Retrieved December 20, 2017, from https://link.springer.com/article/10.3758/BF03212378

Johansson: Motion Perception part 1

Johansson: Motion Perception part 2

Newsome, W. T., & Paré, E. B. (1988). A selective impairment of motion perception following lesions of the middle temporal visual area (MT). *The Journal of Neuroscience*, *8*(6), 2201–2211. Retrieved March 30, 2015, from https://www.ncbi.nlm.nih.gov/pubmed/3385495

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