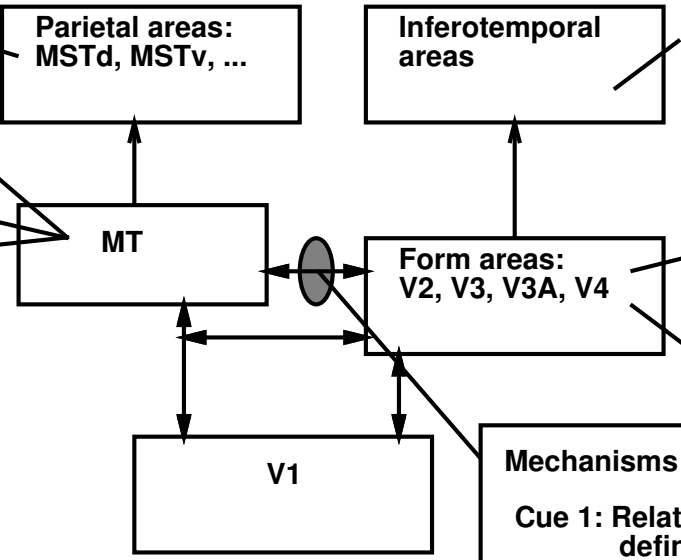
MONKEY PHYSIOLOGY
of Integrating form and motion

Occlusion modulation in MSTv
(Tanaka et al 1991)

MT Lesion results in deficit in kinetic contours
(Marcar and Cowey 1992)

No selectivity for kinetic boundaries in MT
(Marcar and Cowey 1991)

Velocity tuning significantly modulated by surround
(Allman et al 1985, Born and Tootell 1992)



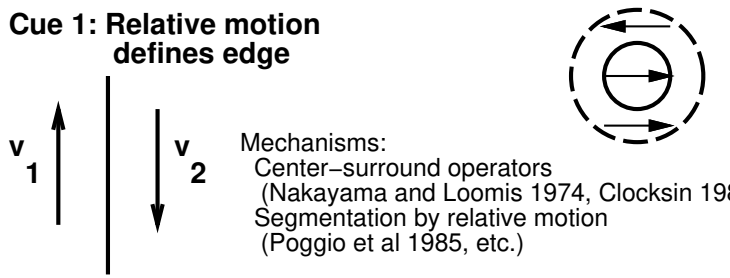
Some IT cells maintains shape−selectivity
independent of cue that defines shape
(Sary et al 1993)

Similar orientation tuning for kinetic and
luminance defined contours in V2, V3A, and V4
(Marcar et al 1992, 1993, Logothetis and Charles 1990)

Selectivity for direction of figure, illusory contours
in V2 (von der Heydt and Peterhans 1989, 1992)

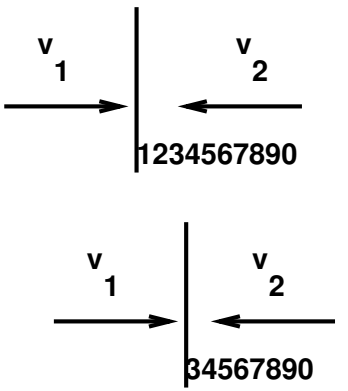
Mechanisms of processing motion−defined form

Cue 1: Relative motion defines edge

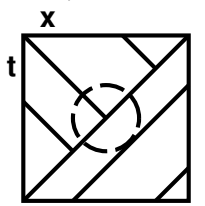


Mechanisms:
Center−surround operators
(Nakayama and Loomis 1974, Clocksin 1980)
Segmentation by relative motion
(Poggio et al 1985, etc.)

Cue 2: Kinetic occlusion

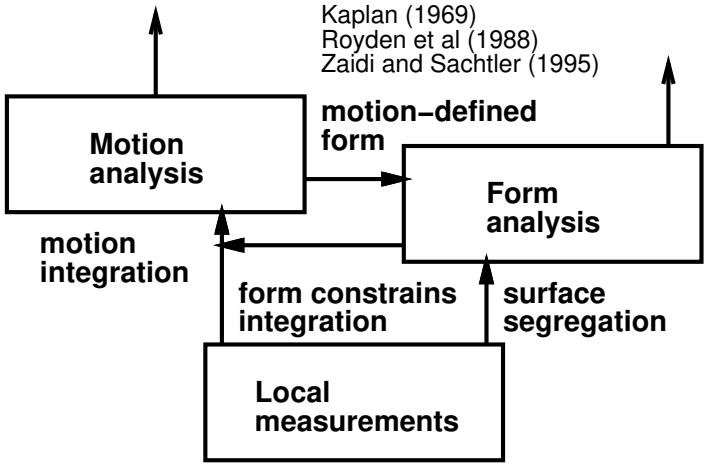


Mechanisms:
Spatiotemporal junction detection
(Niyogi 1995)



HUMAN PSYCHOPHYSICS
of Integrating form and motion

Kaplan (1969)
Royden et al (1988)
Zaidi and Sachtler (1995)



HUMAN NEUROPSYCHOLOGY/IMAGING
of Motion−defined form

ERP study by Lamme et al (1993) indicates motion boundary representation in V1

PET study by Orban et al (1995) indicates area responding more to kinetic boundaries than to luminance boundaries or motion.

Lesion double−disassociation: Vaina et al (1994)

Parietal lesions: Regan et al (1992)