Modeling Integration of Motion-Direction Change-Detection in Human Vision

Submission ID 3000330

Submission Type Poster

Topic Neuroscience

Status Submitted

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SUBMISSION DETAILS

Presentation Type Poster Presentation

Presentation Abstract Summary The integration of motion cues in time and space depends on a hierarchy of motion processing networks in visual cortex. Estimates of motion energy from V1 are pooled in area MT, where neurons respond to motion in a direction-selective manner. Further downstream, selective inputs from MT neurons are integrated by MST neurons that are sensitive to different global optic flow patterns (such as radial or circular motion). We applied various cue integration models to a novel discrimination task in which subjects were required to detect direction change in a stimulus consisting of multiple random dot patches. We ask: Does the integration of motion change signals benefit from coherent motion? And if it does, then what is the mechanism that accounts for the integration of motion direction change? We found that while the presence of global motion was not relevant to our task demands, the model that could best account for human performance did not assume independence between local motion components.

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Keywords

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biological vision

psychophysics
Bayesian modeling
cue integration