◆ **A model of goal-directed integration of motion and stereopsis in visual cortex**

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Optic flow fields contain important cues for the determination of the depth structure independently from stereopsis. But on the other hand depth structure conveyed by stereopsis can also facilitate the processing of optic flow fields and the determination of the direction of heading. Motion selective cells in the middle temporal (MT) area of the macaque monkey can use disparity information to separate motion signals from different depths.

To investigate the consequences of the disparity dependence in MT for a flow field analysis, a simple functional model of the integration of motion and stereopsis in area MT is introduced. In this model MT cells are assumed to average visual motion only within restricted disparity bands. The model acts as the input stage to a biologically plausible heading-detection algorithm which models optic flow analysis in area MST. The use of disparity information for self-motion detection is thus implicit. Depth does not directly contribute to the computations involved in determining the direction of heading: it is only used to support the two-dimensional motion information and to reduce flow field noise.

In line with recent psychophysical findings this approach results in an increased robustness against noise for movements in a cluttered environment. Consistent with the human data there is no advantage in smooth environments such as the ground plane.

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