DISPARITY AND OCCLUSION CUES FACILITATE MULTI-ELEMENT VISUAL TRACKING ((L. Viswanathan¹, E. Mingolla²)) Dept. of Cognitive and Neural Systems, Boston University, MA.

**Purpose:** Human observers can track up to 5 moving targets in a 2D display with 10 identical elements (Pylyshyn and Storm, 1988, *Spat. Vis.*, 3, 179-197; Yantis, 1992, *Cog. Psych.*, 24, 295-340). Previous experiments manipulated element trajectories to prevent intersections of element boundaries, evidently in the belief that transient overlaps among homogeneous elements in a 2D display make the task too hard. We examine whether depth cues such as occlusion (T-junctions) and disparity affect performance in a tracking task when element boundaries are allowed to intersect.

**Methods:** Elements moved smoothly in depth, as well as in horizontal and vertical position throughout a 7 second tracking period. A probe then flashed, and subjects reported whether the flash occurred on a target or on a non-target. Overlapping circular objects form T-junctions when shaded to appear like spheres or figure-eight regions when rendered as disks. Four conditions were considered: (a) no T-junctions, no disparity; (b) no T-junctions, only disparity; (c) only T-junctions, no disparity and (d) both T-junctions and disparity. **Results and Conclusions:** Performance was better for displays with depth information (T-junctions or disparity), suggesting that depth cues are useful for multi-element tracking. All performance levels were above chance, suggesting that intersections do not make the tracking task impossible.

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