Contours from apparent motion: A computational theory
William Prophet, Donald D. Hoffman, Carol M. Cicerone

Human vision readily constructs subjective contours from displays of kinetic occlusion (Kaplan 1969) and color from motion (Wallach 1935; Cicerone and Hoffman 1991). To construct these contours it is argued that human vision must solve the point-aperture problem, a problem more general and more difficult than the well-known aperture problem. In the aperture problem one is given a contour and its orthogonal velocity field, and must compute the full velocity field; in the point-aperture problem one is given neither the curve nor any components of its velocity field, and must construct both the curve and its full velocity field. We formalize the point-aperture problem and present, in special cases, two simple algorithms for its solution.