Abstract

Visual search is extended from the domain of polygonal figures presented on a uniform field to photo-realistic scenes containing target objects in dense, naturalistic backgrounds. The target in a trial is a computer-rendered rock protruding in depth from a "wall" of rocks of roughly similar size but different shapes. Subjects respond "present" when one rock appeared closer than the rest, owing to occlusions or cast shadows, and "absent" when all rocks appeared to be at the same depth. Results showed that cast shadows can significantly decrease reaction times compared to scenes with no cast shadows, in which the target was revealed only by occlusions of rocks behind it. A control experiment showed that cast shadows can be utilized even for displays involving rocks of several achromatic surface colors (dark through light), in which the shadow cast by the target rock was not the darkest region in the scene. Finally, in contrast with reports of experiments by others involving polygonal figures, we found no evidence for an effect of illumination direction (above vs. below) on search times.