

The Effects of Cognitive Load on Full-Body Gaze Control During 3D Visual Search

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Abstract

Increased cognitive load is linked to decreased fixation counts and longer dwell times during visual search. However, past work studied eye movements in 2D tasks, whereas in 3D environments the head and body help the eyes gather information. Thus, we examined how cognitive load affects the eyes, head, and body in 3D visual search. Cognitive load may create difficulty planning the eye, head, and body movements needed to search a 3D space. We used an eye-tracker to record gaze and inertial sensors to measure the motion of the head and body during a dual task paradigm: Participants searched a set of 27 images distributed in a 270° space for stimuli of a specified criteria. Cognitive load was manipulated by having participants count backwards by set intervals (1, 3, 5, 7, and no counting). Results showed a decrease in total fixations and an increase in stimulus dwell times when under load.