

Effects of Stereo Viewing Conditions on Distance Perception in Virtual Environments

Peter Willemsen *Amy A. Gooch^a*
William B. Thompson *Sarah H. Creem-Regehr*

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^aCurrently at Northwestern University

School of Computing
University of Utah
Salt Lake City, UT 84112 USA

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Abstract

Several studies from different research groups investigating perception of absolute, ego-centric distances in virtual environments have reported a compression of the intended size of the virtual space. One potential explanation for the compression is that inaccuracies and cue conflicts involving stereo viewing conditions in head-mounted displays result in an inaccurate absolute scaling of the virtual world. We manipulate stereo viewing conditions in a head-mounted display and show the effects of using both measured and fixed interpupillary distances, as well as bi-ocular and monocular viewing of graphics, on absolute distance judgments. Our results indicate that the limitations on the presentation of stereo imagery that are inherent in head-mounted displays are likely not the source of distance compression reported in previous virtual environment studies.