

R. D. -X. de Lange, R. Martin Bien Bakker and T. J. Juliana Bos, "Evaluating Perceptual Deviations in Video See-Through Head-Mounted Displays while Utilizing Physical Touchscreens," 2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct), Bellevue, WA, USA, 2024, pp. 497-500, doi: 10.1109/ISMAR-Adjunct64951.2024.00144.

Abstract:

Extended reality technology has become a useful tool in many applications, but still suffers from visual deviations that can hamper the utility of the technology. This paper evaluates the types of persisting visual deviations experienced when observing the natural world through video see-through head-mounted displays. Video see-through sight was compared with normal eyesight in a human-in-the-loop experiment, focusing on (camera) lens distortions and display deviations. Participants interacted with a real touchscreen, locating the position of flashed markers shortly after disappearance comparing both conditions to check for deviations in position and time. Results show significant larger mean distance errors between the interaction locations and the original marker positions for video see-through compared to normal eyesight. Moreover, errors increase towards the screen periphery. No significant distance error improvement over time was found, however, response times did significantly decrease for both types of sight.