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David Anton, Gregorij Kurillo, Ruzena Bajcsy

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User Experience and Interaction Performance in 2D/3D Telecollaboration

David Anton[a,*], Gregorij Kurillo[a], Ruzena Bajcsy[a]

[a]*Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, United States*

Abstract

Affordable 3D cameras, mixed reality headsets, and 3D displays have recently pushed the Augmented Reality (AR) and Virtual Reality (VR) technologies into the consumer market. While these technologies have been adopted in video-game and entertainment industry, the adoption for professional use, such as in industrial and business environment, health-care, and education is still lagging behind. In light of recent advances in mobile communications, AR/VR could pave the way for novel interaction and collaboration of geographically distributed users. Despite the technology being available, majority of communication is still accomplished using traditional video conferencing technology which lacks interactivity, depth perception, and ability to convey non-verbal cues in communication. 3D systems for communication have been proposed to overcome these limitations; however, very few studies looked into the performance and interaction with such technologies. In this paper, we report on a study that examined telecollaboration scenario with three different modalities: 2D video-conferencing, 3D stereoscopic interface, and 3D stereoscopic interface with augmented visual feedback. Twenty participants worked in pairs, assuming the roles of instructor and worker, to remotely interact and perform a set of assembly tasks.

Keywords: Telecollaboration, Remote Interaction, 3D Interaction, Augmented Reality, Virtual Reality, Telepresence

*Corresponding author

Email addresses: davidantonsaez@eecs.berkeley.edu (David Anton), gregorij@eecs.berkeley.edu (Gregorij Kurillo), bajcsy@eecs.berkeley.edu (Ruzena Bajcsy)