Summary 2:

Immersive Collaborative Analysis of Network Connectivity: CAVE-style or Head-Mounted Display?

VR has reached a huge breakthrough in terms of availability with the introduction of HMD. Before this, expensive room-filling facilities such as the CAVE have been the popular trend. To determine if HMD could potential replace CAVE, investigation into the difference between the two styles for collaborative visualization of abstract data was conducted. The main difference in the two platforms is that CAVE allows free walking, the ability to see the other user, but with wand based interaction while Oculus is seated, unable to see the other party, but uses hand-motion tracking. Pairs of users collaborated to complete two tasks: counting triangles and finding shortest path between two nodes. Users were rated based on their performance, collaboration, and experience. Results showed that the VR platform did not significantly affect the accuracy, interaction, and type and degree of collaboration between users. The completion time was shorter for HMD and this maybe because users had to move in the room for CAVE. The reduction in completion time was independent of the strategies used for the task. There was a surprising lack of difference in terms of oral communication between the two platforms.

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abstract={High-quality immersive display technologies are becoming mainstream with the release of head-mounted displays (HMDs) such as the Oculus Rift. These devices potentially represent an affordable alternative to the more traditional, centralised CAVE-style immersive environments. One driver for the development of CAVE-style immersive environments has been collaborative sense-making. Despite this, there has been little research on the effectiveness of collaborative visualisation in CAVE-style facilities, especially with respect to abstract data visualisation tasks. Indeed, very few studies have focused on the use of these displays to explore and analyse abstract data such as networks and there have been no formal user studies investigating collaborative visualisation of abstract data in immersive environments. In this paper we present the results of the first such study. It explores the relative merits of HMD and CAVE-style immersive environments for collaborative analysis of network connectivity, a common and important task involving abstract data. We find significant differences between the two conditions in task completion time and the physical movements of the participants within the

space: participants using the HMD were faster while the CAVE2 condition introduced an asymmetry in movement between collaborators. Otherwise, affordances for collaborative data analysis offered by the low-cost HMD condition were not found to be different for accuracy and communication with the CAVE2. These results are notable, given that the latest HMDs will soon be accessible (in terms of cost and potentially ubiquity) to a massive audience.},
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