Abstract

The Star Trek Holodeck experience was pitched as the ultimate in VR environments, perhaps embodying the dream of true telepresence, in which users receive the full sensory experience of being in another location. However, most so-called "telepresence" systems today offer little more than high-resolution displays, as if all one needs to achieve the illusion is Skype on a big screen. Despite the hype, such systems generally fail to deliver a convincing level of co-presence between users and come nowhere close to providing the sensory fidelity or supporting the expressive cues and manipulation capabilities we take for granted with objects in the physical world.

My lab's objectives in this domain are to simulate a high-fidelity representation of remote or synthetic environments, conveying the sights, sounds, and sense of touch in a highly convincing manner, allowing users, for example, to collaborate with each other as if physically sharing the same space. Achieving this goal presents challenges along the entire signal path, including sensory acquisition, signal processing, data transmission, display technologies, and an understanding of the role of multimodality in perception. This talk surveys some of our research in these areas and demonstrates several applications arising from this work, including support of environmental awareness for the blind community, remote medical training, multimodal synthesis of ground surfaces, and low-latency cross-continental distributed jazz jams. Several videos will be presented, illustrating early successes, as well as some of the interesting behavioral results we have observed in a number of application domains.

Attached you will find further information.