Virtual Iraq: Initial Results from a VR Exposure Therapy Application for Combat-Related Post Traumatic Stress Disorder

Rizzo,A., Pair,J., Graap,K., Rothbaum,B.O., Difede,J., Reger,G., Parsons,T., Mclay,R.N., Perlman,K.

Abstract

The 'Virtual Iraq' VR environment is designed to be an immersive tool foruse as an Exposure Therapy treatment tool for combat related PTSD. The application consists of a series of virtual scenarios designed to represent relevant contexts for VR exposure therapy, including city and desert road environments. In addition to the visual stimuli presented in the VR HMD, directional 3D audio, vibrotactile and olfactory stimuli of relevance can be delivered. Stimulus presentation is controlled by the clinician via a separate 'wizard of oz'; interface, with the clinician in full audio contact with the patient. The presentation at the conference will detail the results of our research and clinical treatment protocols as they stand at that time. Presently, an open clinical trial to evaluate our system's efficacy for PTSD treatment with military personnel is being conducted at the Naval Medical Center San Diego and at Ft. Lewis, Washington, and a randomized controlled trial comparing VR alone and VRcycloserine is in progress at Emory University. Ten other test sites are now on line between now and the conference addressing a variety of research questions involving assessment of PTSD, physiological markers of the disorder, impact of multiple trauma events, and an fMRI study. Thus far, eight male and female treatment completers (out of 11) at two of the treatment sites have shown clinically significant improvements at post-treatment, with these patients now no longer meeting PTSD criteria. Due to the challenges for treatment of this disorder, we are encouraged by these early results.

The Visual Computing of Projector-Camera Systems

Bimber,O.

Abstract

Their increasing capabilities and declining cost make video projectors widespread and established presentation tools. Being able to generate images that are larger than the actual display device virtually anywhere is an interesting feature for many applications that cannot be provided by desktop screens. Several research groups discover this potential by applying projectors in unconventional ways to develop new and innovative information displays that go beyond simple screen presentations. Todays projectors are able to modulate the displayed images spatially and temporally. Synchronized camera feedback is analyzed to support a real-time image correction that enables projections on complex everyday surfaces that are not bound to projector-optimized canvases or dedicated screen configurations. In this talk I will give an overview over our projector-camera-based image correction techniques for geometric warping, radiometric compensation, reduction of global illumination (such as inter-reflections) or view-dependent effects (such as specular reflections), increasing focal depth, and embedding imperceptible codes with a single or with multiple projection units. Thereby, GPU-based real-time rendering and computer vision on graphics hardware are tightly coupled. Such techniques have proved to be useful tools for many real-world applications. Examples include ad-hoc stereoscopic VR/AR visualizations within everyday environments, quality improvements for (semi-)immersive VR projection displays, on-site architectural simulations, augmentations of museum artifacts, video installations in cultural heritage sites, projections onto stage settings during live performances, presentations using mobile (pocket) projectors, outdoor advertisement displays, digital illumination and projections in modern television studios, computer games, and more.