Proceedings of the 8th World Congress on Electrical Engineering and Computer Systems and Sciences (EECSS'22)
Prague, Czech Republic - July 28- 30, 2022
DOI: 10.11159/mhci22.001

Multimedia Augmented and Virtual Reality Human-Computer Interfaces

Roy Eagleson
Western University, Canada

Abstract

Human communications is actually mediated by a surprisingly limited bandwidth set of output capacities, despite having the capacity for high bandwidth input sensation and perceptual channels. Despite this, the richness of communications spans all of Multimedia and carries all the richness of expression, from the Arts to the Sciences. One novel multimedia channel is through the use of shared virtual worlds. Yet AR/VR is like a double-edged sword: Displays can be compelling and powerful – yet when certain design principles are violated, they can be confusing and unusable. We explore some of the reasons for this, from the perspective of Human-Computer Interaction, which necessitates a design process that is informed by basic scientific results from the noverlapping domains of Perception, Action, and Cognition. This keynote lecture will explore the special "capacities and constraints" of these three basic subsytems. The talk will then examine some of the implications and fundamental concerns for general AR. The talk will focus on the implications for particular applications in various Multimedia applications, and some which are specialized for Surgical Planning, Guidance, and Targeting, with case studies drawn from published papers on the use of AR for Neurosurgery.