INVRSE

2010 - Current
Project Leader: David Nelson

Background

Immersive hardware for technologies such as virtual reality and augmented reality tend to be expensive to purchase, costly to maintain and cumbersome to use. To address this situation, ICT has been a pioneer in low cost VR hardware R&D since 2010.

Initial experiments included working with tablets to achieve a larger Field of View (FOV), but researchers quickly discovered that the tablet could offer a novel hybrid platform of 2D touch and 3D visualizations in one platform, providing casual immersive experiences with the lowest barrier of entry.

When DARPA launched its XDATA big data visualization program, ICT was awarded R&D funds to continue pushing forward in this area, utilizing the first iteration of the now patented INVRSE platform, to enable an analyst to enter the data using body-based, spatial interactions.

Consisting of a hybrid 2D touch-screen, with a 3D-based media platform, its hardware can be reproduced inexpensively and easily using a 3D printer. The hardware components of INVRSE include a simple lens assembly which slides onto the top portion of a tablet screen. This allows the user to experience content in either virtual (VR) or augmented reality (AR) while also using traditional media formats like text, photos, or video.

Objectives

ICT's INVRSE delivers a hybrid and holistic media ecosystem, combining traditional formats like text, photos and videos with emerging mediums like VR and AR. INVRSE allows users to intuitively and casually jump in and out of various formats without having to switch apps, platforms, or devices. Content for INVRSE runs on widely used mobile-based technology and hardware. Media can be streamed from either a WiFi or a cellular network, or it can be pulled down locally to devices from the cloud to be accessed in areas of limited to no connectivity.

INVRSE also has the capacity to go from being an individual experience to a fully social one. Creators can network devices together and designate a leader to guide a team of users through an immersive experience. This is particularly impactful in the sectors which have training and education at their cores.

Results

INVRSE has been used to provide research and development solutions for the US Navy exploring the future of communication and collaboration and for DARPA investigating body based interactions for big data visualization and analysis.

Next Steps

The future capabilities of an INVRSE solution can include an easy-to-use content creator tool complete with templates and guidelines to help add, edit, and share hybrid - immersive media.

The MxR Lab seeks partners to help transition the INVRSE platform to the world at large.

Published academic research papers are available from https://ict.usc.edu/research/publications
(Search engine keyword: USC ICT Publications)

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Established in 1999, the USC Institute for Creative Technologies (ICT) is a Department of Defense (DoD) University Affiliated Research Center (UARC), sponsored by the US Army. Harnessing Hollywood-derived creativity with academic innovation and military-domain expertise, ICT conducts award-winning R&D in Artificial Intelligence (AI), Computer Graphics, Geospatial Sciences, Human Performance, Learning Sciences, Modeling, Simulation & Gaming, Mixed Reality (MxR), Medical VR, Narrative, and Virtual Humans.