

‘VIRTUAL MRI TRAINING LEADS THE WAY’

Linac Simulator & Training Facility created with HoloVis 4K ApolloWALL for Cardiff University

Working with Cardiff University’s Schools of Computer Science and Healthcare Studies, HoloVis was chosen as the specialist visualisation solution providers to design the latest photo-realistic radiotherapy treatment machine simulator (linear accelerator) as part of the Virtual Environment Radiotherapy Training (VERT) training program.

The pioneering educational suite provides a cost effective and safe alternative to training in clinical environments where radiotherapy students can gain extensive ‘hands-on’ experience of using specialist clinical equipment without risking harm to themselves, patients or the equipment. In addition to enhancing student clinical and patient contact time, the VERT suite also makes it possible to simulate the effects of doses of radiation on different organs and tissue with pinpoint accuracy in relation to where the treatment is exactly administered on the virtual patient’s body.

HoloVis won the tender to provide their latest virtual reality rear-projection wall solution (ApolloWall) due to their extensive expertise in 4K resolution projection systems, a key requirement for this next-generation facility, and their ability to not only deliver a turn-key solution but to support the facility and the University in partnership going forward.

The ApolloWALL was designed to deliver photo-realistic interactive content using the 4K projectors and computer technology that HoloVis specialise in. Professor Dr. Nick Avis at Cardiff University explained “This was critical to the design of the system to ensure that the students ‘felt’ that they are working with a real linear accelerator system and patient and that the interaction was as natural as possible. In previous VR simulators much lower resolution projectors have been used and their poor setup and limited technology has meant that students using the system would suffer from ‘image flicker’ and hence motion sickness and could not use the technology effectively all the time.”

Overcoming these technical challenges was a key requirement in the system specification and 4K resolution with excellent 3D stereo-depth, with minimal left-eye/right-eye cross-talk (ghosting), was therefore essential.

To ensure that the 3D imagery complied with the requirements set out by the University, HoloVis integrated the latest switchable Infitec passive stereo colour-based

filter system into each of the dual-stacked projectors ensuring exceptional 3D depth reproduction with next-to-no perceivable ghosting of the passive-stereo images. The area in front of the wall where the students are immersed in the simulation needed to be accurately and seamlessly tracked to allow the users to naturally walk and look-around the virtual environment, treatment room and virtual patient. To ensure that this was as seamless and unobtrusive as possible, HoloVis integrated a camera-based motion tracking system into the room to track the users head and hand position in real-time for natural navigation and interaction. The use of a camera-based setup ensured that the interaction was seamless; the users have reflective markers on their stereo-glasses to avoid the need for any obtrusive electronics or trailing cables.

