



## WORK WITH US

The Virtual Engineering Centre (VEC) delivers innovative solutions to industry through the exploitation of academic research and the latest scientific and technology infrastructure. Enhancing capability through Virtual Innovation, the VEC is the UK's leading centre of Virtual Engineering technology integration for industrial and commercial applications.

Underpinned by the academic excellence of the University of Liverpool, the VEC delivers advanced modelling, simulation and visualisation solutions to enable business growth and competitiveness. A strategic partnership with the Science and Technology Facilities Centre's Hartree Centre additionally provides ease of access to the UK's most powerful supercomputing facilities available to industry.

For more information about how your organisation could benefit from working with the Virtual Engineering Centre:

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## Transforming pre-operation planning for the NHS

The Virtual Engineering Centre, in partnership with Alder Hey Children's Hospital, is pioneering a new surgical planning technique using Virtual Reality (VR) tools developed for the automotive sector. These innovative tools will assist in the preparation of complex operations, resulting in improved patient outcomes and increased efficiencies.

### THE CHALLENGE

At Alder Hey the surgeons operate on extremely small hearts from sick children. Using traditional CT and MRI scans it is not possible to fully interrogate the problem prior to surgery or interact intuitively with the data.

Using emerging VR technology, the children's hospital wished to develop a prototype system that will allow surgeons to better plan for complicated interventions and thereby de-risk those interventions and increase the likelihood of successful first-time outcomes.

### THE SOLUTION

Using MRI and CT scan data the VEC was able to produce a virtual heart. The heart could

be easily manipulated through either voice recognition or gesture control.

### THE BENEFITS

Mr Iain Hennessey, Head of Innovations at Alder Hey is excited to see the prototype develop into a product which could be used within the hospital's new Innovation Hub.

*"We are amazed by the possibilities that working with the VEC has enabled. Standing inside a virtual heart 8ft high, operating a virtual torch to examine for defects, has been one of the highlights of my innovation career so far. The ability to accurately assess the miniature detail of a sick child's heart, using advanced 3D visuals is a technology that we will continue to pursue in partnership with the VEC."*

The technique has potential to reduce the number of exploratory surgeries and operation times.

Distributed simulation also allows heart surgeons to share expertise with remotely-based colleagues.

In addition, virtual reality can accelerate the training of surgeons and medical

professionals. It also acts as a visual communication tool to assist the patient and their family through the patient journey.

*"We are amazed by the possibilities that working with the VEC has enabled. Standing inside a virtual heart 8ft high, operating a virtual torch to examine for defects, has been one of the highlights of my innovation career so far. Applying some of the cutting edge technology operated by the VEC to improve the care of children has been an incredible journey. The ability to accurately assess the miniature detail of a sick child's heart, using advanced 3D visuals is a technology that we will continue to pursue in partnership with the VEC."*

*Iain Hennessey, Alder Hey Children's Hospital*