Getting real with **VR**

An expert in the deployment and use of virtual reality, Prof Bob Stone tells **Neil Tyler** that he sees a maturing technology at the tipping point

Professor Robert Stone has been involved in the world of virtual, augmented and mixed reality for some 30 years, experiencing the ups and downs of a still maturing industry. He holds a Chair in Interactive Multimedia Systems within the College of Engineering and Physical Sciences at the University of Birmingham, where he is also director of the Human Interface Technologies (HIT) Team developing virtual and mixed reality simulators.

"I'm more optimistic about the industry today than I have been for a long time and I've witnessed a number of investment cycles. It has certainly been a roller coaster ride but I think that we have finally reached a point when the industry is both more mature and the technology more affordable," he suggests.

"Looking to the future there will certainly be a process of Darwinian selection among those products under development. Only a fraction of those on display at this year's CES, for example, will get to market. I'm still amazed at the level of investment going into SMEs in this space though, especially as the opportunities for long-term success remain limited."

An expert in ergonomics Prof Stone started his commercial career with British Aerospace (BAe) in the 1980s.

"I was working at the company's Filton facility, where I specialised in 'human factors', and was involved in defence projects as well as in the development of offshore oil and gas remotely operated submersibles.

"My work with BAe attracted the attention of the European Space Agency (ESA), which was looking to develop remotely operated devices to service low orbit satellites. Working with ESA, I was then invited to NASA and, on a trip to the Ames Research Centre in 1987, I was introduced to virtual reality (VR) for the first time.

"With a headset and glove, I was placed at the bottom of a virtual escalator. It used very simple wire framed graphics, but the impression it made was profound. I could see real potential for the technology in the future."

National Advanced Robotics Centre

Prof Stone was one of just a few Europeans to experience the NASA VIEW VR system and, on his return to the UK, helped to set up the first industrial VR team at the UK's National Advanced Robotics Centre (NARC)

"Working at BAe, there really wasn't that much interest in applying VR, with the notable exception of work it was conducting into advanced cockpits. The move to the NARC in the early 1990s proved rewarding, both professionally and personally."

Established 25 years ago, the centre attracted funding but what really helped, according to Prof Stone, was a feature on the BBC that looked at the work of the centre.

"That programme demonstrated the possibilities of VR and attracted considerable interest from companies, it was to prove massively influential. Rolls Royce, Vickers, the NHS and Sainsbury all wanted to find out more about the potential of virtual reality.

"As a result, we started to receive funding from industry to support complex demonstrations of the technology in what was then, the world's first industrial collaborative project addressing the commercial applications of VR."

While working for the centre, the team was approached by the Russian cosmonaut space programme to help develop VR technologies.

"It was before ITAR and the restrictions that we now see when it comes to trading in technology," Prof Stone explains. "We created the first desktop virtual model of the MIR space station and introduced VR into their programme."

In May 1996, Prof Stone was elected to become an Academician of the Russian International Higher Education Academy of Sciences in Moscow and in 2000, was accredited by General Klimuk, Director of Russia's Gagarin Cosmonaut Training Centre as being responsible for 'introducing VR into the cosmonaut space programme'.

Academia calls

Towards the end of the 1990s, funding problems saw the robotics centre spun out as a small business and, despite being involved in numerous projects that used VR for helicopter and gunnery training, Prof Stone made the move into academia.

"It was the right time for me. I'd been working in the commercial space for more than 20 years, but it was certainly a 'culture shock'."

Since his appointment, Prof Stone has taken what he would describe as a very pragmatic approach to human factors research and regularly spends time conducting observational studies in the field with subject matter experts to ensure the relevancy and impact of any research he and his students undertake.

"I learned the value of this approach when I studied for my MSc. I'd been captivated by science fiction as a boy; it piqued my interest. I was lucky as the course I took was really hands on. That meant visiting naval vessels, working on tube trains; it appealed to those boyish interests.

Professor Bob Stone

Professor Robert Stone holds a Chair in Interactive Multimedia Systems within the College of Engineering and Physical Sciences at the University of Birmingham, where he is also director of the Human Interface Technologies Team. He currently holds the position of Visiting Professor in Simulation Psychology within the University of Plymouth.

Prof Stone has worked in the field of virtual and mixed reality for more than 30 years and was instrumental in establishing the first industrial VR team at the UK's National Advanced Robotics Centre, where he brought together (initially) 12 companies to fund the world's first industrial collaborative project addressing the commercial applications of VR.

"What we do here at Birmingham is very interactive; my work involves understanding the real world and developing VR/MR environments that match that. I need my students to engage with people in the real world and I have always used that approach when it comes to teaching.

"We have a good mix of students here at Birmingham, although we do need to attract more women students. There are certainly not as many as I would like, but the balance is improving."

Prof Stone is also adamant that there has to be a commercial outlet for the research that is undertaken.

"There have to be potential stakeholders who are interested in the work because too many projects end up with no application and are just left on the shelf," he argues.

This practical approach to research and teaching means that students get to apply their technology in the real world, whether that's with Royal Navy vessels conducting close-range weapons and missile trials, oil and gas support platforms in the North Sea or remotely operating vehicles for trials in the waters around Scotland.

"Teaching needs to be practical and we need students who are able to apply their studies in the real world. There is certainly a lack of consistency across the university sector and we need to retain and extend dedicated VR courses," Prof Stone believes.

"But beyond that we need more practical examples of where VR can work. It's crucial that we develop credible, believable metrics and quality case studies. Only then will we convince investors, who were badly burned in the 1990s, when the equipment and the experience of VR failed to live up to expectations.

"The VR environment remains one in which hype and false promises are still prevalent," he concludes.