WIZARDS AND UNICORNS, THE WONDERFUL NEW WORLD OF XR

Courtesy of RSC

In the world of education, motion capture is increasingly breaking out of animation, VFX and game design departments and being put to work in an ever-growing raft of other disciplines. At the University of Portsmouth, the Centre for Creative and Immersive Extended Reality (CCIXR) is getting several steps ahead of the trend by incorporating a dizzying array of technologies into a single facility for exploring the future of XR.

CCIXR BRINGS TOGETHER A HIGH-TECH PLAYGROUND FOR IMAGINING THE FUTURE OF VR AND AR

Trevor Keeble, Executive Dean of Creative and Cultural Industries, University of Portsmouth

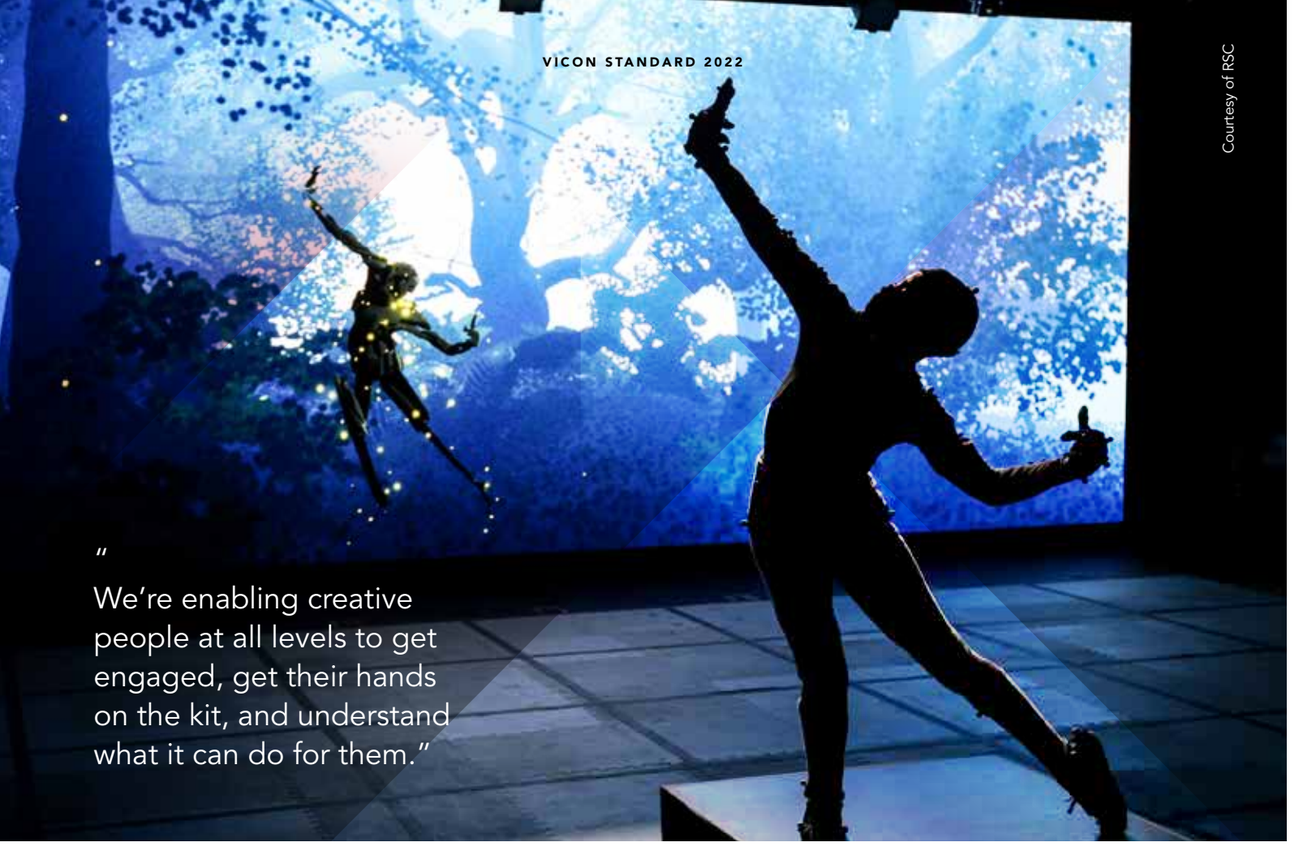
Trevor Keeble, Executive Dean of Creative and Cultural Industries at the university, says that when he joined his department several years ago, it was already clear that the school of creative technologies had a deep specialism in motion capture and other departments were taking notice. He began having conversations about how his team could focus that growing connectivity into a bigger project.

"The really key thing for me about CCIXR, and I think it's key to the nature of the faculty as a whole, is that we're at our best when we're working in partnership with industry," says Keeble. "Although we emerged from the creative and media industries and that's where our technical expertise has come from, we actually have real skills in taking it cross-sector."

That thinking ultimately led to the creation of a new facility, opening in early 2022, that houses a war chest of technologies associated with virtual and augmented reality or, as they're increasingly being referred to, extended reality.

The center will act as both a teaching facility for students and an XR R&D resource for industry, establishing the Solent region as a hub for immersive media.

The backbone of the center will be the technology that ties all the other disciplines to each other and to the physical world — its Vicon motion capture system.



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"We're enabling creative people at all levels to get engaged, get their hands on the kit, and understand what it can do for them."

Alex Counsell, Faculty Technical Adviser for Creative and Cultural Industries, University of Portsmouth

Pippa Bostock, Business Director for CCIXR

THE TECHNOLOGY

"It's an extension of what I've been doing in the mocap studio for years," says Alex Counsell, Faculty Technical Adviser for Creative and Cultural Industries and the man responsible for designing the center.

"It all started with the widening use of our Vicon system, especially real-time technology. We were doing more and more virtual production within the mocap studio, and we were using VR to enable that. And all of a sudden, all of this cross-pollination with different technologies was happening. We've always been aware of the wider pipeline of technology outside motion capture to feed content in and drive content with motion capture.

"So that was really the thought process behind it, building this end-to-end pipeline. We can capture people and performances, we can scan, we can do it live or pre-recorded in various formats, we can then explore how people interact with that through headsets, through screens, through LED walls. We can examine how you interact with that as a user, then how you realistically deliver that technology to a performance and a usable space."

To that end, CCIXR has acquired a set of Vicon's Vantage cameras for its main volume, with additional sets of Veros for smaller pop-up stages, and two Origin systems for location-based VR.

Alongside the tracking systems will be an impressive set of related technologies, including systems for volumetric capture, photogrammetry and spatial computing, a VR lab, development bays, simulation facilities, a mixed reality tech lab, and an immersive communication space.

"It really is the Swiss Army knife of kit that we've got," says Counsell. "Mocap is a key tool, but it has so many crossovers. It's like the thing you couldn't do without in your toolbox. If you want to move something within an XR space, you need to track it."

While motion capture might be the key tool, it's the way it will interact with the other technology that will make CCIXR special.

"You don't find studios that have all of that kit together," says Counsell. "You go to a scanning company to scan your actors, you go to a volumetric company for that, you go to mocap studio to do this. So to have that huge selection of tools in order to explore what they can do in combination is a really exciting prospect."

BRINGING CCIXR TO NEW USERS

While CCIXR won't officially open until next year, the Creative and Cultural Industries department has already begun applying the center's tools to a range of different challenges. The most high profile was the Royal Shakespeare Company's production of Dream, a live event inspired by A Midsummer Night's Dream that blended performance capture with a computer-generated environment.

Other projects have included immersive street art; scanning, LIDAR and 360 degree videos of sculpture by *My Dog Sighs* for the production of a VR version of an exhibition; and even an immersive simulation with a motion platform that the Royal Navy is using for training sailors to pilot one of its ships.

One of the themes that runs through the entire project is cross-pollination, whether that's from bringing together technologies in new ways or from introducing different people and organizations to the world of XR.

"The fact that we're working cross-sector is really important because we can take the learnings from the theater world and apply them into, for example, the medical world, and vice-versa," says Pippa Bostock, Business Director for CCIXR.

"Everyone from the Royal Navy through to a local startup SME in the health sector can come to us and say, 'Can you explain to me more what this technology is, or how I could use this?' We're enabling creative people at all levels to get engaged, get their hands on the kit, and understand what it can do for them.

"We all forget, because we work and live in this wonderful world of XR technology, that there's a huge percentage of the business market that has no concept of what this technology is, what it can do for them, and how it can help them. The key to CCIXR is that we want businesses and organizations to give us actual challenges. And then we can show how these technologies can be applied to have real-world impact."

AN OPEN-ENDED APPROACH

Counsell emphasizes another core aspect of the center's philosophy: play. "Having that chance to play and experiment is really important," he says, "because that's when these happy accidents happen. You didn't realize by doing one thing with a bit of technology that, all of a sudden, something magical happens. And it spawns a whole new direction of exploration."

CCIXR's leaders hope that the center will be able to bridge the perceived gap between creative and technical disciplines. "Our work is creative and technical," says Keeble. "From an educational perspective, it's very important for us to make that point, because the debates currently in the education sector are all about this kind of polarization of STEM and creative courses. Our experience, and the proposition at the center, is that actually, creative industries will bring value to anything in any industry. The creative and the technical are fundamentally linked.

"Historically, there's a bit of a tendency for the modes of technology to dominate creative processes, but I think we try at all times to be really respectful of other people's practices. When you're walking into the RSC, you're really not allowed to dominate their practice because they're the RSC!"

It's a point that comes up more and more often among Vicon customers — motion capture technology has become user-friendly enough that using it is now less about deep technical knowledge than it is about creative and innovative outputs.

Or, as Bostock puts it, "The best technology disappears. It just gets lost in the magic. I'm very lucky, I get to work with wizards."