Twenty Years of the Mixed Reality Laboratory

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ABSTRACT

The mixed reality lab has now been a staple of the CHI community for twenty years. From its founding in 1999 through to today, we have placed our relationship with art and artists at the forefront of our research methods. In this retrospective exhibition, we present some of our most recent and exciting work, alongside some of our archived works, and ask viewers to consider twenty years of CHI research and innovation - not just from our lab, but from the whole CHI community. Back in 1999 when we started, *Virtual Reality* was the exciting new technology. A lot has changed since then.

Figure 1: Thresholds

Figure 2: VR Playground

INTRODUCTION

The Mixed Reality Lab at Nottingham University, or just the 'MRL' is this year celebrating twenty years of innovation and participation in the CHI community. Founded in 1999, from its earliest days the MRL has collaborated with artists, pioneering a methodology called 'performance-led research in the wild' [1]. This methodology emerged from HCI's engagement with artists and cultural applications. Being performance-led means engaging with artists to create and realise artworks as a way of exploring novel uses of emerging interface technologies. Being in-the-wild means revealing how public audiences experience it under the realistically stressful conditions of public performance as a professionally commissioned work. Papers that follow this approach typically provide a reflexive account of both the artist's design rationale and the audience's experiences, reflecting across both to draw out wider lessons for HCI.

In this installation, we celebrate twenty years of collaborating with artists to create fascinating and exciting works. We present some of our more recent collaborations: *Thresholds*, *VR Playground*, *The Moment*, and *The Enchanted Forest* as well as some of our historical collaborations: *The Broncomatic* and *The Prediction Machine*. We have also created a kiosk which allows visitors to browse through many of our previous works, from our first 1999 collaboration with Blast Theory in *Desert Rain*, through the BAFTA nominated *Uncle Roy All Around You* and more than 20 other works. As we look back on the last twenty years of innovation, we also look forward to the next. We hope to be showing where we've gotten to at CHI2039!

THRESHOLDS

A collaboration with artist Mat Collishaw, *Thresholds* is a multi-user physical virtual reality experience, where visitors get to explore one of the first exhibitions of photography: William Henry Fox Talbot's 91 'photogenic drawings' on display at King Edwards' School in Birmingham, 1839. Visitors experience a lovingly recreated instance of the great hall, which has since been demolished, built with the guidance of architectural and social historians. Thresholds doesn't take place in an empty 'real space'. Rather, a physical representation of the room was created with the VR experience overlaid on that physical reality to an exceptional level of fidelity. Thresholds has been on tour around the UK, premiering at Somerset House, before visiting Birmingham Museum and Art Gallery, Lacock Abbey, and The National Science and Media Museum, Bradford. It has most recently been on display at Yapi Kredi KÃijltÃijr Sanat Yayincilik A.S. Istanbul. To date more than ten thousand visitors have experienced it, and it has been a resounding critical success, with a number of TV, and national print media articles. It was also shortlisted for the 2018 South Bank Sky Arts Award for Visual Art.
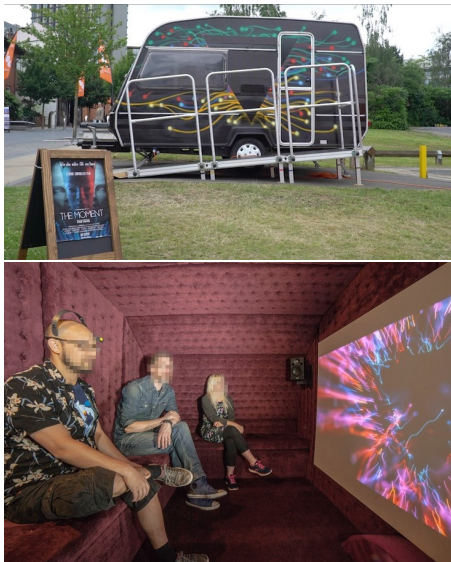
Figure 3: The Moment

Figure 4: The Enchanted Forest

VR PLAYGROUND

A collaboration with Artist Brendan Walker, In *VR Playgorund*, A series of up to eight swings - with each rider wearing a VR headset, take their riders on a journey through one of a series of beautiful abstract environments. In each world, the motion of the swing is re-mapped in a different way.

   High roller sees the rider zooming through a cityscape, as if trapped in a giant hamster-ball; Jellyfish sees them jetting upwards from the abyss through a coral reef and into the open water, encountering various creatures; shuttlecock sees you springing from building-roof to building-roof among the zeppelins; while walker has you stomping though another city as if you were a giant robot. Brought to life with Brendan's unique art style, and a fabulous responsive soundtrack by Matthew Olden. VR Playground has been exhibited at many locations, including contemporary art galleries, shopping centres, national museums, public parks and squares. VR Playground can be presented as visual artwork, performance, a technological marvel, or simply as an amusement ride. A unique visual-kinaestheic experience, part thrill-ride, part art-exhibit, part showmanship, VR playground is now on an international tour having been deployed all over the UK, as well as Munich, Seoul, Philadelphia, and has thrilled some 15,000 riders to date.

THE MOMENT

The Moment (see IMDB[1]) is an interactive brain-controlled film by Artist Richard Ramchurn that employs a consumer EEG headset to provide live attention data that drives the edit, sound mix, and scene combinations of a 24-minute-long movie. The Moment blends three narrative threads in one story world. The film is scripted as 17 distinct scenes that are always presented in the same order, running to a fixed length. Each of these threads has two alternate sound designs: a primary design that includes foley (sound effects) and main musical themes and a secondary design that is predominantly atmospheric soundscapes. From the viewer's perspective, a screening's narrative for each scene is constructed from the combination of two of these narrative threads, one with a primary sound design and the other with a secondary. The variation available means that there are billions of possible versions of the film to see, each uniquely generated by the controllers brain data; where understanding of the single overarching narrative improves from repeat experiences. The Moment is presented in a small caravan converted into a plush cinema, seating a maximum of seven audience members, designed especially for the film, to encourage intimate screenings in a controlled environment. As an evolution of our previous film *Scanners*: winner of Best Arts Paper at CHI2016, this current film was initially previewed at CHI2018, premiered at Sheffield Doc/Fest in 2018, and has been on tour across the UK and Europe, including Ars Electronica and Reykjavik International Film Festival.

[1]https://www.imdb.com/title/tt7853742/

Figure 6: The Prediction Machine (picture credit Julian Hughes)

THE ENCHANTED FOREST

The Enchanted Forest with Artist Roma Patel is a participatory installation for children 0-10 years and their grownups. It prioritises children's engagement by weaving together childrens' ideas with fairy folktales, myths and interactive technologies, to create a space for playful imaginings, interactions, performance and storytelling. The Enchanted Forest is as an example of merging traditional theatre craft with digital DIY technology and sensors to enhance childrens' imaginative play through active participation. It draws from total and immersive theatre to create a 'performative installation' where performers, storytellers and 'enchanted' scenography performs alongside children. The installation has five interactive areas - Musical lily pads, frogs lair, story tree, the heart of forest and a fairy lagoon.

THE BRONCOMATIC

A work from our archives - circa 2010, and one of our earlier collaborations with artist Brendan Walker, we have always wanted to be able to bring the *Broncomatic* to CHI. A bucking bronco provides a quite intensive physical experience for a single rider (usually sufficient to throw them off) that is controlled in real-time (by a human operator). Bronco rides clearly push back on the rider, throwing them around and demanding considerable physical exertion as well as concentration. This one is different though - it's controlled by your breathing. The broncomatic uses a breathing monitoring system to detect each time and how much a rider breathes, then directly translates this to its movements. The work was about exploring reactive thrill rides - could a ride become personalised to its rider, as well as more generally exploring the nature of breathing as a semi-controllable input mechanic. As an added bonus, it really is an enormous amount of fun to ride.

THE PREDICTION MACHINE

The Prediction Machine is an interactive artwork, by Rachel Jacobs, based on end of the pier fortune telling machines. The machine marks "moments of climate change" in our everyday lives and prints out 'climate fortunes' for 30 years in the future, that visitors to the machine can take away with them. These predictions use live weather data captured at a local weather station, matched with projected climate data from future climate models provided by scientists at the UK MET office, and observations by local people. The machine links up to an interactive website that combines narrative and visual representations of the data with more traditional science communication.

REFERENCES

[1] Steve Benford, Chris Greenhalgh, Andy Crabtree, Martin Flintham, Brendan Walker, Joe Marshall, Boriana Koleva, Stefan Rennick Egglestone, Gabriella Giannachi, Matt Adams, Nick Tandavanitj, and Ju Row Farr. 2013. Performance-Led Research in the Wild. *ACM Trans. Comput.-Hum. Interact.* 20, 3, Article 14 (July 2013), 22 pages. https://doi.org/10.1145/2491500.2491502