Demo

First Contact – Take 2
Using XR to Overcome Intercultural Discomfort (racism)

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Abstract

Digital/human encounter is explored through a suite of experiences that comprises common/room, an art installation that uses various modes of Extended Reality (XR) to support social engagement and generate connections with a view to reversing processes of societal atomisation and intercultural discomfort (racism). common/room is exhibited as an informal dining room where each table hosts a distinct experience, designed to bring people together for discussion, active listening and considered response. Although XR is my tool, real encounter is my aim.

Each experience, be it using 360 3D video in a headset or projection, or AR, simulates informal face-to-face encounters in the setting of a domestic kitchen or dining room. Visitors to one such experience, First Contact – Take 2, are invited to sit at a dining table where, by wearing a head-mounted Augmented Reality display, they encounter a volumetric representation of an indigenous Māori woman seated opposite. She speaks out of her culture that has refined collective endeavour and relational psychology over millennia.

CCS Concepts

• *Human-centered computing methodologies* → Mixed / augmented reality; Collaborative interaction; Computer supported cooperative work; *Hardware* → Sensors;

1. Introduction

First Contact – Take 2, references the moment when Māori and Pākehā first encountered each other on the shores of Aotearoa centuries ago. It is inspired by a desire to make good relationships between newcomers and tangata whenua or people of the land, descended from the pre-colonial inhabitants of this place. Extended Reality technologies (XR) affords all participants a safe and playful way to imagine the potential for a newfound connection and a mutually beneficial future.

Jane Ruka, a Maori woman, is pre-recorded as a 3D reconstructed volumetric representation with voice and will be displayed on an optical see-through AR head-mounted display for the demo. She addresses us directly, asking us who we are and where we are from, calling on visitors to question their relationships with people and place and provoke a consideration of what might constitute solid foundations for a healthy, mutually beneficial and ongoing relationship between people from diverse cultural backgrounds. Under normal, non-Covid, circumstances their responses could be recorded and relayed to the original subjects who are kept safe in the comfort of their own time and space.

The research focuses on the moment of encounter, when the first baby steps towards the formation of interpersonal relationships and ongoing social interaction are initiated. In the context of a colonised world, first encounter dramas echoes down the years.

Māori arrived in Aotearoa New Zealand a millennium ago, having travelled across the ocean from other Pacific islands to the North. The vast Pacific Ocean, Moana Nui A Kiwa, is their home turf. They were seasoned and brilliant navigators, bringing with them their language and culture, the kumara, yam and taro. Then, in 1513, Europeans ventured into Oceania and, in 1642, Dutchman Abel Tasman, had a "bloody, but mercifully brief first encounter" in "New Zealand", that he named for Zeeland in Holland. [OMA2012]

Another visitor to Aotearoa New Zealand, whose arrival 250 years ago was marked recently with mixed reactions, is Captain James Cook who first arrived on our shores in 1769. On board his ship, The Endeavour, was Joseph Banks, an aristocrat and self-funded naturalist. His worldview was based on the Great Chain of Being that placed so-called blue-blooded individuals nearest to God, at the top of the hierarchy, just after the angels. The Irish and the Scots, my people, labelled barbarians, were beneath them, although they were considered higher up than so-called indigenous savages. Captain Cook is said to have

taken a more relational approach. [SAL17] However, contrary to advice from his superiors, his men shot and killed a number of locals and he too was eventually slain by Polynesians in Hawaii.

2. Aim

First Contact – Take 2, honours the call by Māori to have a "seat at the table" [JM16] and find new ways to approach and old problem. My intention is to give users an opportunity to sit in close proximity to indigenous people in order to give them a sense of ease when next they have a real-life encounter with people from a different culture.

3. System Overview and Implementation

Our system allows users to record and playback volumetric data using a variety of devices. Their capture and playback is detailed below.

3.1 Capture

We used DepthKit (depthkit.tv) for recording the volumetric capture. This software currently only supports single camera input which is one of the limitations of our system. However, this suited our needs as the encoding used is easy on computing resources and, due to the table-top setup and the fact that all users are seated opposite the volumetric who is always gazing directly towards the user.

Prior to using depth-kit, we have tried recording using in-house built tools using unity. While in recording mode, we used two azure kinect cameras that are in master-slave configuration. Instruction to start recording goes to the master and the master triggers the slave to start recording. This is done so that the videos are frame-synced. Once the video is captured it is saved to the disk and can be used for playback. A high-level system overview is shown below (Figure 1).
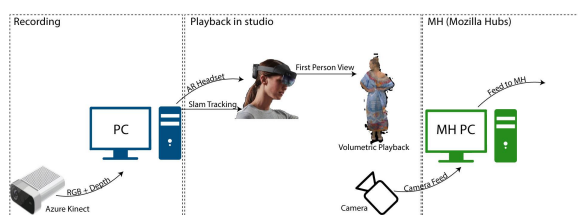

Figure 1: *Technical setup to provide material for M. Hubs*

3.2 Playback

We developed an Augmented Reality Head-mounted Display using off shelf devices for playing back the volumetric data. We used the "NED+Glass X2" as an AR display and used an Intel T265 camera for the 6DoF tracking.

The requirement was for a lightweight device that has SLAM tracking and has a good field of view and this setup met the criteria.

Due to Covid-19 pandemic, the experience has to be tailored as a digital experience for remote audiences. We can stream the experience as a video to Mozilla Hubs. See *First Contact – take 2* in Mozilla Hubs for Ars Electronica 2020 (Figure 2).
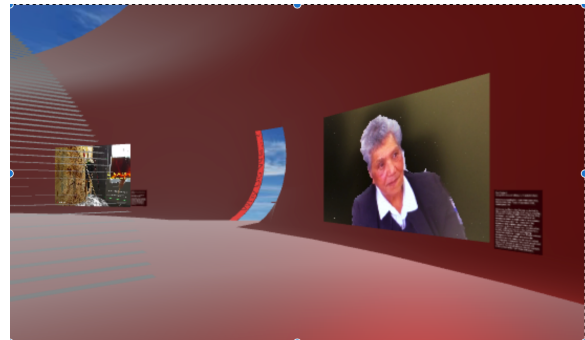

Figure 2: *First Contact Take-2 in Mozilla Hubs*

4. Conclusion

After solving issues in a previous iteration, including audio sync, registration, inability to edit and lack of direct gaze, we are satisfied with this current setup. Mairi has been searching for ways she can hand some XR technologies over to the Māori community, with whom she has been working for 15 years, as a way to fulfil requirements expounded in the Matike Mai Report [JM16]. The community recently approached her to record their rural meetings. By using 360 cameras on a moving support, she will be able to relinquish the controls so they will be able to position and activate the camera then edit the footage themselves.

Her mentor who runs proceedings agreed to discuss the practice and the technology, captured by the Insta Pro2 3D 360 camera. The footage will then be cropped and warped for projection, using an Acer Predator Z650, onto a 180 degree half cylinder screen. This will complete the suite of experimental approaches that include 360 VR, projected VR, AR and a table in Real Reality (RR) with no technology present.

References

[JM16]]   Jackson, Moana and Mutu, Margaret and The Independent Working Group on Constitutional Transformation. *He Whakaaro here Whakaumu Mō Aotearoa: The Report of Matike Mai Aotearoa – the Independent Working Group on Constitutional Transformation*. Auckland: University of Auckland., 2016.

[OMA12]   O'Malley, Vincent. *The Meeting Place*. Auckland, N.Z: Auckland University Press, 2012.

[SAL17]   Salmond, Anne. *Tears of Rangi : Experiments Across Worlds*. 1st ed.