Oceans We Make: Immersive VR Storytelling

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Figure 1: Oceans We Make immersive VR storytelling.

ABSTRACT

Oceans We Make (OWM) is a 3-minute long immersive and inter-active virtual reality (VR) experience that encourages participants to question their use of plastic. The experience blends beautiful cinematic graphics, engaging game mechanics and an emotional narrative as a novel form of VR storytelling to drive positive environmental impact.

CCS CONCEPTS

• **Computing methodologies** → **Virtual reality**;

KEYWORDS

Immersive storytelling, cinematic VR, serious games

1 INTRODUCTION

The anti-plastic movement has escalated over concerns about ocean pollution and harm to marine life. Cities and major food and beverage operators have started announcing bans on single-use plastic bottles, straws and bags. However, it is difficult to convey the scale of ocean waste affecting our oceans from a first-person perspective. The experience depicted in Oceans We Make is inspired by actual stories of scuba divers and adventurers who have come across astounding and unbelievable amounts of ocean trash. This trash seemingly came from nowhere, and yet passed through the hands of all of us at some time, only to end up in a place where it will forever pile up unless positive action is taken. This project aims to draw social awareness on ocean waste and potentially effect a change in attitudes and behavior about the usage of plastics. The experience was created by Warrior9 VR, a leading Singapore VR animation studio in partnership with MeshMinds, an impact investor in creative technology for good.

2 MOTIVATION

The urgency of environmental issues is often neglected because waste and pollution are invisible among us [Solomon et al. 2018]. Narration in VR and Augmented Reality (AR) provides an opportunity for participants to observe and interact with a virtual representation of a coral reef undergoing the destructive effects of ocean pollution to raise awareness about the issues [Marsh et al. 2017; Mc-Sheery et al. 2016]. Furthermore, cinematic VR allows storytellers to create an emotional connection with the participants [JauntVR 2018], and elicit both positive and negative emotions as they are unable to detach themselves from being part of the experience [Cho et al. 2016]. Research has also shown that increased involvement of

body movement during gameplay results in increased enjoyment [Bianchi-Berthouze 2013]. Warrior9 VR developed a novel form of cinematic experience that combines VR emotion-evoking narration to create an urgency about ocean pollution, while coupled with game mechanics and body movement to engage participants.

3 INTERACTIVITY AND EXPERIENCE

3.1 Narrative

Members of the audience are invited as participants who are taken to a beautiful diving site on a vessel as shown in Figure 1. The participant is then plunged into the sea for a dive. An immersive virtual world of sea corals and plants, and animation of schools of fish are presented. Lighting and shadings of the water were fine tuned to make the virtual environment realistic. The participant's left controller has a virtual torch that can be used to illuminate the marine life. The animation path of the participant was carefully curated so that corals and fish appear within arm's reach, prompting participants to interact with them.

3.2 Game Play Mechanics and Interaction

While the participant is immersed in the diving experience, a simple UI instruction and audio presents him/her with an objective of using one or both the hands to collect the plastic bottles and other pieces of trash that start to appear along the diving path. The system tracks the participant's hand collision with the waste objects, and upon each successful collection, rewards them with an increasing score. Initially the number of waste objects are sporadic, allowing the participant to be familiarized with the game mechanic. Over time the objects are increased exponentially, prompting the participant to struggle to keep up with the collection. Towards the end, it is literally impossible to keep up as the ocean is filled with waste objects as illustrated in Figure 2. The participant is then brought up to the ocean surface to realize the scale of pollution that overshadows the beautiful ocean that he/she experienced at the beginning of the journey. The demonstration is highly interactive and fun, while encouraging big body movements. The participant's performance draws the audience's attention as shown in Figure 3.

4 USER FEEDBACK

Oceans We Make has received an overwhelming response in many exhibitions, including, MeshMinds 1.0: ArtxTechForGood at Art-Science Museum Singapore, Making Waves Fundraiser at San Francisco, S.E.A. Aquarium at RWS, Singapore and Techsauce Global Summit in Thailand. Over 1000 people have experienced the impact of the work.

"Featuring the latest VR technology, this immersive multi-sensory experience delivers a powerful message about environmental conservation through gamification," said Honor Harger, Executive Director, ArtScience Museum, Singapore.

As an ongoing research, user feedback was collected in the most recent exhibition. Two hundred users tried the experience and 69 users filled in a post-experience questionnaire. Users rated their experience on a series of questions on a numerical scale of 1 to 10, 1 being Not at all and 10 being All the time. They also provided an optional open-ended feedback. To the questions, *How much did you enjoy the VR experience?* and *How concerned did the VR Experience*

make you feel about ocean pollution?, the mean ratings are 8.94 with a standard deviation of 1.40 and 8.68 with a standard deviation of 1.21 respectively. Open-ended feedback suggested that the ocean pollution issue is more visible and they are compelled to take action. User feedback quotes are shared below.

"I think it makes the ocean's pollution issue more relatable. It visualizes the urgency of the issue. It also show pollution affects sea creatures."

"I feel guilt that I use plastic and then throw away to the ocean."

"I want to help reducing the pollution by spread the news and starting from careful about the disposal to the ocean."

"It was really sad to see fish died and poison by the pollution. And while we are saving ourselves but we forgot all about the innocent animal, I will care about this more."
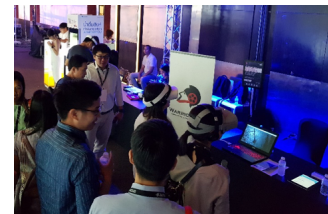

Figure 2: Waste objects filling the ocean.

Figure 3: Participants engaging in OWM experience.

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