Unilever Virtual Pre Move
March 15, 2017

Introduction to XR Media Technologies

Virtual and Augmented Reality (VR/AR) are two of the most common Extended Reality (XR) technologies that create 3D media. This content, along with projection mapping and robotics) will increasingly become a part of everyday life. By wearing a "head mounted display" (HMD), one will observe digital media for entertainment, education, productivity, and much more.

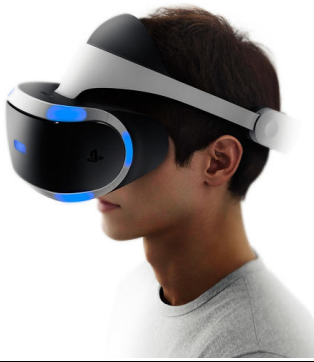
Augmented Reality is the fusion of digital media into your real environment. See demo of Microsoft HoloLens, battling alien robots. AR Demo here

Virtual Reality is when your vision is purely virtually. See demo of HTC Vive, playing in fantasy worlds. VR Demo here

The youth and the early adaptors will shape the VR and AR industry, effecting more than 50% of the market (Customer Segments of Technology Adoption), which is expected to be a 150 billion dollar industry by 2020. Twenty-five percent of the US population will have adopted AR/VR by 2022.

Augmented Reality	Virtual Reality
(Digital media infused in real environment)	(Vision is purely virtually)

Microsoft HoloLens



Sony PSVR

Unilever Virtual Pre Move Overview

Assignment: To provide a life-like simulation of a "Pre Move" which is designed for an assignee to experience their new host location prior to physically moving.

Background: *An "assignee" is one of our employees who is sent abroad to work. His/her assignment usually lasts 3-5 years. Prior to the physical move to the new host location, as part of our destination services, our assignees are offered a Pre Move visit which is facilitated by our vendor Destination Service Provider's (DSP) . During this visit the assignee will be guided/driven around by DSP local field consultant to have a look at housing options, schooling, local facilities (i.e. sports), public transport, city highlights, parks, etc. They may go into houses or schools, shopping centers, parks, drive by tourist attractions, restaurants, etc. The intention is to give the assignee a feel for what life would be like in the host location. Each visit is tailored a bit to the assignee's needs (i.e. singles vs. families) however the visits have an overall similar feel.*

Objective: To design a virtual experience so life-like and informative that flying to the host detonation is unnecessary in earning the assignees commitment to the transition.

Strategy:

1. We will create a fully immersive, fun and "gamified" experience where users can virtually dive into their potential new home and engage in a "day in the life" through an a-la-carte offering of places, people and amenities.

2. Our simulation will engage neural structures that communicate spatial information to hi-jack" the brain into believe it's synthesized surroundings are real.

3. Monitor and record spoken passive and biometric data to improve the experience from our artificial intelligent hosts, to adjusting environments based on preference.

4. Develop for the experience to be interchangeable with new scenes from different cities for easy customization of the experience based on need. IE, we build one structure that can orient one to Rotterdam, or Singapore simply by switching our a few files.

The User Story

Unilever will offer the assignees the opportunity to explore their new host country through a fully immersive experience that tailors toward their lifestyles and personal needs. This experience engine will be designed to influence the assignee to have a realistic and positive opinion of their host city.

Once inside the VR headset, our user will find themselves in a beautiful and enchanting Unilever lobby. They will be warmly greeted and welcomed by a virtual host[1]. After a short conversation (where we log preferences) we will "dreamscape[2]" to a 360-video of their airport, then to a still photogrammetry[3] of their host city airport and then to a room-scale photo-real 3D model[4] of one of the city's top attractions. It will be a gorgeous day! (It's always sunny in VR) and it is take only a few seconds to travel from the airport, to downtown and then into their new house's living room.

Now that they've received a glimpse of their new home and been debriefed, it is time to make their first decision. Our user will help narrate the storyline as they live out their "day-in-the-life" through prompts by the virtual guide. "There is so much to do! How shall we begin? Would like to go upstairs, freshen up and explore the house, or head downtown for a smoothie[5] where you will meet (depending on the user[6]) your new friends?"

The the parameters of the screen will be their GPS coordinates on the map providing them with insights and information they would be interested to know, such as "metro home, Line A, 32 minutes, $2.20) and choose[7] to board the metro with the tap of a finger

The user can access their map at anytime to chose their next POI. Or, from their "home-base" the user can discover new location's offerings by exploring the environment. Imagine you are in a simulation of a house, and see bookshelf that has book clearly out of place and slightly glowing[8] When you pick up the glowing book your guide voices "Oh yes, we have an amazing school system here, ranked for this and famous for that. Why don't we go check out the school! all you have to do is raise your hand to the sky, as if the teacher is calling on you and you've the answer![9] and they dreamscape to the class room! The class room can be a still model, a live 360 stream of an actual classroom, or inhabited be an avatar teacher that can answer their real questions in real time.

Clarifying New Concepts

[1] Virtual Guide: This virtual guide can be de modeled after a specified human (Unilever's head of HR?) an animated character (friendly mascot) or even a real person remotely rendered and composited live and in real time. If we chose an NPC (Non-player character – IE a computer avatar, we can program smart algorithms that allow the NPC to continuously learn and increasingly improve their offerings and conversational ability. Answers to the initialization questions will influence the way in which the experience unfolds.

[2] "Dreamscaping" an artistic transitioning a user without breaking immersion or cognitive flow. It is to VR what editing is to film, a spatial slight of hand. This tactic of dreamscaping from a "360-video" environment to "photogrammetry" and then into a "photo-real 3D model" will have a psychological effective of demonstrating clear improvement in environment from one scene to the next, starting with real images of a familiar location.

[3] Photogrammetry: This process known as photogrammetry involves using images from a conventional digital camera to create three-dimensional scenes, exploiting the differences in photos taken from different positions and angles.

[4] Room-scale photo-real 3D model: is the use of a clear space to allow movement for someone using a VR application such as virtual reality gaming. Being able to physically move within the space helps to replicate real-world movement for the user and make the virtual environment seem more real. The term *room-scale* distinguishes that type of setup from the self-contained environment of a VR room and from seated or standing VR, in which the user remains stationary.

[5] Provide a few beverage/snack options that can be provided in their current location. After the experience, you can offer them a real smoothie to carry this dream-like experience they just had into the cognitive reality.

[6]This can be new colleagues, the chef of a local restaurant, a young single neighbor, all depending on the user. In fact, they can have all three possible encounters in front of them and chose demonstratively, instead of explicatively.

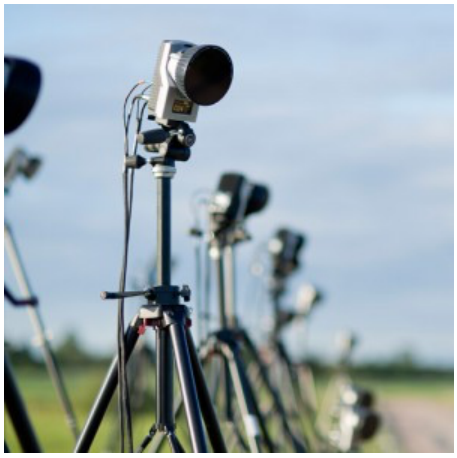
[7]We can map out the full route in which one travels (IE we can replicate the entire bike ride Lynne takes in Rotterdam from work to home). The user will be offered the option to cycle, walk (teleport), taxi or fly place in which public transportation is not available.

[8]These glowing items are "live" as in they are portals to bring you to a point of interest.

[9]Triggers an be voice, eye-gaze, controller button, or physical gesture

Production

With the production based here in New York we will write a script to be approved by Unilever based on their creative ambitions. Once complete we will travel to necessary destinations to capture content and information for a variety of cutting edge technologies that will all brought together in a "game engine". Game engines are the software displays "immersive media" or "extended reality" into head mounted displays.



We begin with the traditional disciplines of high-end video production, and combining other tech-arts found commonly in theater and game development, such as motion capture, emotion recognition, photogrammetry, visual effects and sound.

We will motion capture any people we want in the experience, or film them in front of green screen and composite in. We will capture a sound fields of the environments, 5.1 sound, microphoning all willing participates and storyline characters

We'll capture 360 video content and structure recognition to model the environments, and in post polish to provide Unilever with stock content for future use.

We will embed virtual cameras into the engine to capture 3rd party point of view of the user during the experience. We will be doing this by recording the users in front of the green screen and super-imposing the environment into their surroundings. (Just like the VR demo on page 1)

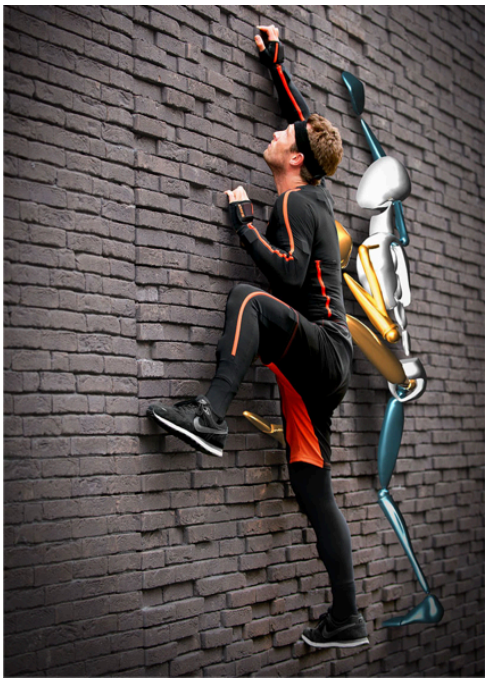
The mixed reality, as described above can be used for video and photo promotion on any other platform or campaign.

We will develop for all major platforms, including HTC Vive, Oculus Rift, TheWebVR, Android and iOs.

Glossary of Disciplines

Game Engine:
https://en.wikipedia.org/wiki/Game_engine
A game engine is a software framework designed for the creation and development of video games. Developers use them to create games for consoles, mobile devices and personal computers. The core functionality typically provided by a game engine includes a rendering engine ("renderer") for 2D or 3Dgraphics, a physics engine or collision detection (and collision response), sound, scripting, animation, artificial intelligence, networking, streaming, memory management, threading, localization support, scene graph, and may include video support for cinematics. The process of game development is often economized, in large part, by reusing/adapting the same game engine to create different games, or to make it easier to "port" games to multiple platforms.

Motion Capture:
https://en.wikipedia.org/wiki/Motion_capture
Motion capture (Mo-cap for short) is the process of recording the movement of objects or people. It is used in military, entertainment, sports, medical applications, and for validation of computer vision and robotics. In filmmaking and video game development, it refers to recording actions of human actors, and using that information to animate digital character models in 2D or 3D computer animation. When it includes face and fingers or captures subtle expressions, it is often referred to as performance capture. In many fields, motion capture is sometimes called motion tracking, but in filmmaking and games, motion tracking usually refers more to match moving.



Emotion Recognition:
https://en.wikipedia.org/wiki/Emotion_recognition
Emotion recognition is the process of identifying human emotion, most typically from facial expressions. This is both something that humans do automatically but computational methodologies have also been developed.