Aphasia VR

Kristina D. Mahagamage
University of Montana, Missoula, km150711@umconnect.umt.edu

Aphasia VR

Kristina Mahagamage
MFA Media Arts
University of Montana
2021

TABLE OF CONTENTS

01

INTRODUCTION

What is Aphasia? What is VR?
Examples

Aphasia VR

Is an immersive simulation that presents a real-world scenario tailored to persons with Aphasia with the goal to improve communication skills.

What is Aphasia?

- Aphasia translated means “Without language”.
- It affects the four different modalities of communication; speaking, reading, writing, and listening.
- It affects a diverse group of people and is not subjective to any certain group, race, age, or gender.
- Only 15% of people are aware of Aphasia, however, it affects 2- 4 million Americans on average with a range of impairments in communications

What is Virtual Reality?

- Virtual reality allows people to interact with a computer-generated simulation in real-time using natural senses composed by a collection of technologies.
- The basis of current virtual reality research is the concept of immersion in a simulated world with complete sensory input and output.
- There are three main components of VR; functionality, human interaction, and environment.

Applications of VR

Studies

The MIST (minimally invasive surgical trainer) system developed by Rory McCloy and Robert Stone. Put, "the systems training interface, based on modified laparoscopic instruments, is translated into a relatively simple real-time 3D computer graphics that accurately track and represent the movement of the instruments within a virtual operating volume. The use of this technology is now commercially available.

EVA PARK

EVA Park developed by a team at the University of London designed a compelling experience for persons with Aphasia. It has an astoundingly positive effect on people with a “high-rating of enjoyment”

02

PROJECT OVERVIEW

What is Aphasia VR?

Purpose

Using current therapeutic methods for Aphasia intervention and applying them to a simulated immersive experience, users/patients can practice and improve their communication deficiencies in a simulated environment. VR provides a safe space for users/patients to practice real-world communication skills.

Elements

Aphasia
Understand current therapies

Aphasia VR
An immersive simulation using a HMD tailored to persons with Aphasia with the goal to improve communication skills.

Design
Create an environment that simulates the real-world

Technology
Develop interactivity using Oculus

03

METHODOLOGIES

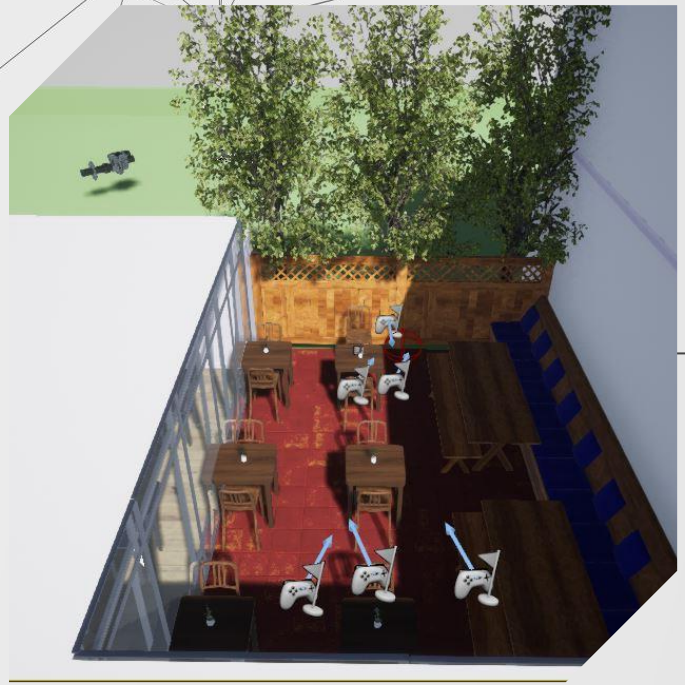
Aphasia, Design, Technology

Aphasia Therapies

Collaboration with SLHOS

In traditional therapeutic methods the patient is presented with an image, for example Clock. The patient will guess the name of the object. A series of phrases with the image will be cycled through and each time the patient must say the correct word

Design



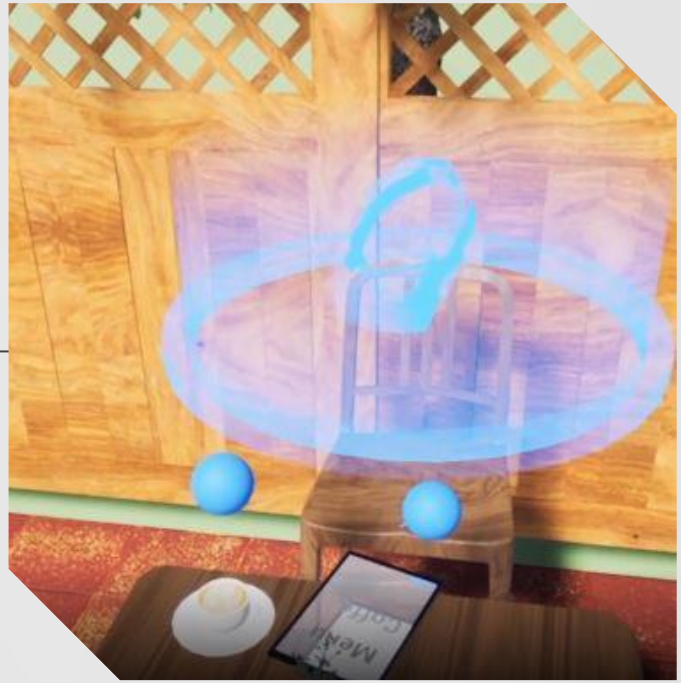
Creating the Simulation

Concept art and or a 3D block out of the environment. This experience is being developed in Unreal Engine 4 (UE4) because of its ability to handle real-time renders,high-quality imagery, as well as complex interactive scenarios. Textures, materials, lighting, and post-processing effects are also key to creating a believable experience.

Virtual Reality

Interactivity

UE4 has its own visual nodal network code language, which allows creative artists to quickly create interactions. In the example the user will be able to interact using speech recognition the clinician. The headset used is Oculus Rift with Haptic controls. And multiplayer capabilities.



04

The Proof of Concept

Work in Progress

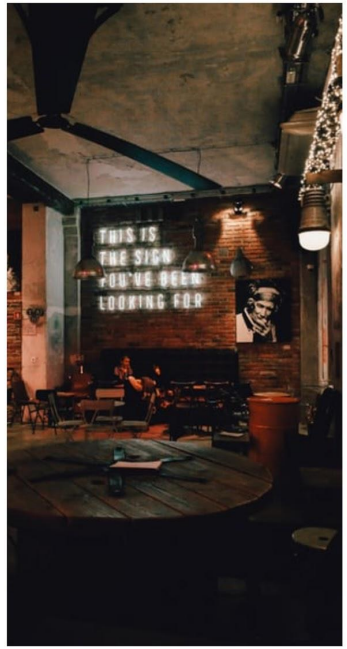
Ideation

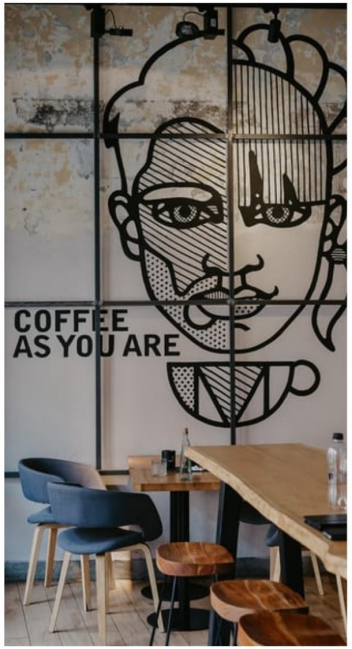






Location Moodboard

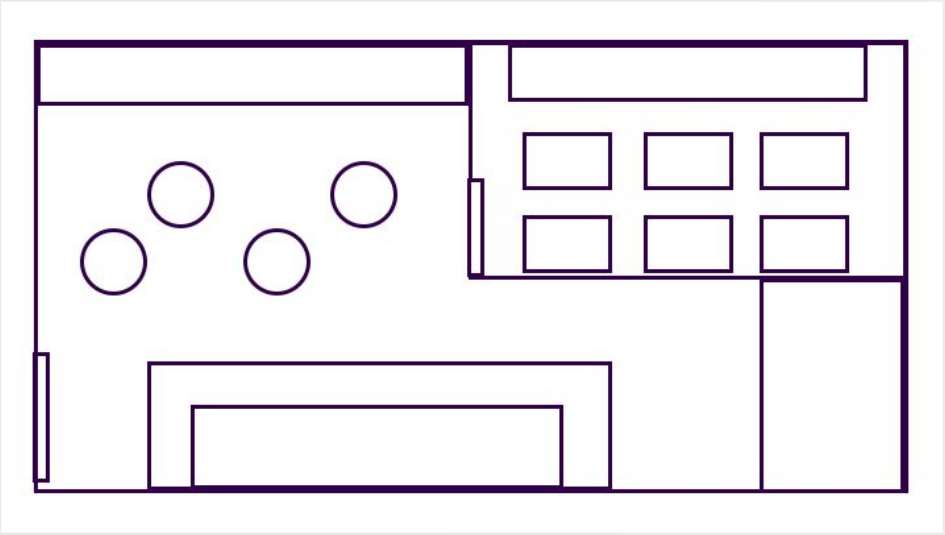


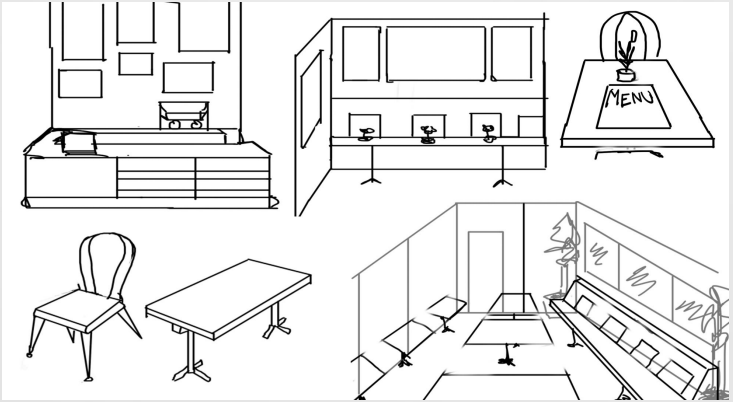


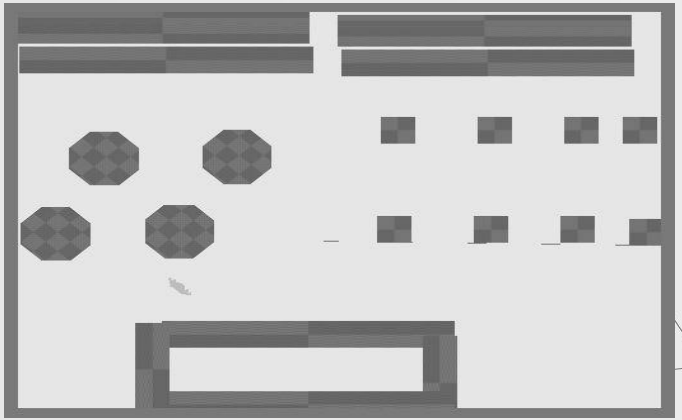
Design Moodboard

Concept Mood Board

Concept







Sketches + Layout

UE4 Environment Build

Interactivity

The Menu is grabbable using haptic controllers. Menu is presented on a table.

User will say word presented on the menu using speech recognition or the assistance of a clinician.

“Coffee”

When said correctly.

Coffee will appear on the table.

Host Avatar

Allows for Multi-user function.

Host can control the experience to benefit the user.

User Avatar.

Host can see the User and observe how they interact in the experience.

Other Elements

Speech Recognition will be implemented using the Google API.

Speech Recognition

3D spatialization audio will be implemented for an immersive experience.

Audio

05

Conclusion

- In Aphasia VR, VR will be used to create simulated real-world situations for patients in reflection on the current methods of virtual therapies being used today with the guidance of a Clinician.
- Creating a virtual reality simulation for the use of clinicians to improve PWAs ability to communicate using real-world-simulation of challenges and situations.

Thank You!