VR Spacial Sound Demo

for hearing aid comparison and value highlighting during the fitting process of the local hearing aid store hoerportal24 in Ingolstadt

The Team

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The Motivation

Showing the value of hearing aids to a customer with hearing loss can be quite a challenge. Because of how our brain works patients with hearing loss get used to hearing their surrounding with hearing loss. Even with hearing loss a car driving by or the sound of birds and even the voice of loved once are getting normal again duo to the ability to adapt to the new way of hearing. At first this seems to be a good thing, but speech has its fixed frequency range. Therefore, understanding is a major problem with hearing loss. A hearing aid brings back the sounds using amplification of soft sounds per frequency range, but also by dumping high sounds that would mask speech. The problem here is that only in a very fixed scenario those advantages are perceptible in the short time a customer stays at the hearing aid store. Often it takes up to a month of training to accept the newly gained old way of hearing, because the brain needs to undo the adaption to the previously suffered hearing loss.

The Idea

Having a VR simulation to bring the customer in a very abstract but clear to understand audio scenario makes it possible to show him advantages of wearing a hearing aid without straining the patient too much.

Simple objects that emit sound and can be turned on and of let the user create an individualized scene for the customer to experience. The simulation can be used with hearing aids fitted and without or with a simple hearing loss simulation for normal hearing customers.

The user should be able to interact with objects such as a plate. The plate could be dropped to simulate impulsive sounds with and without hearing loss. A singing bird flying by could help pointing out the loss of orientation with a hearing loss and a car driving by emitting noise could simulate how hard it is to understand a person simulated directly in front of the user.

The surrounding must be abstract and rater simple to not generate the illusion of an actual outside scene but a simulation.

The Outcome

The outcome would be a first scene that enables the user to activate different sound sources and speech coming from a person in front of the user. The user should be able to walk around in the abstract area and interact with some of the objects.

The Goal

The finished project should be capable of being used as an evaluation tool to find out if this type of simulation can be used in a hearing aid store to help the customer experience the advantages of a hearing aid in a simple and fun way.

The Requirements

The local store hoerportal24 will offer two VR headsets (Oculus Rift and Go) with controllers that can be used for the project. Furthermore, there is a pool of sound sources available under license (only used for demos inside this specific store) that can be used for the project.

As of the software Unity will be used. XXXXXXXXXXXXXXX. (We need more details here maybe you can add a little bit about the coding part)

The Optional Extensions

The mentioned hearing loss simulator could become the focus of the project in order to expand the value to the people with normal hearing. Simulating an individual hearing loss is very difficult and should not be part of the project because it is not the focus of this course. Using three sound sources might be a possible solution to that. On for a typical hearing loss simulation, one to balance a real hearing loss and the original signal. With this the user could toggle between hearing loss, healthy hearing and compensated hearing loss experience.

Video Link to add to GitHub Dok: RealSpace 3D Audio Demo - YouTube