BLOG ENTRY 2 - DESIGN & RESEARCH 1

Immersive Audio

In my first blog, I had briefly talked about my interests, skills and area of expertise. I have decided to focus primarily on immersive audio for my research. Despite focusing on a niche, I had multiple ideas to choose from. The potential concepts are as follows:

- Application of immersive audio in storytelling
- Relationship with ASMR and Binaural Audio
- Custom made earbuds for recording immersive audio and creating distinct sound profiles
- Creating immersive audio reactive visuals for binaural audio

Each concept is distinct and would be implemented differently. Immersive audio in storytelling and ASMR would be more research heavy and the results would be based on graphical data and other observations. The results and inference will be based on the measured outcomes.

Immersive audio helps craft and enhance stories in various ways. In games, the audio helps players interact with their surroundings and keep them alert on what is going around in the background. This is very common in RPG games and is a crucial part of the storyline.

ASMR has become very popular over the past couple of years thanks to Youtube and other social media apps. Autonomous Sensory Meridian Response or ASMR is a calming sensation that is perceived by certain people in response to soft and subtle sounds like tapping and whispering. These sounds are induced to reduce stress and calm the person. This experience has become more immersive thanks to binaural recording, which usually mimics human hearing using a dummy head microphone such as the Neumann KU 100.

This also made me curious as to why we haven't developed this technology further into something more accessible and easier to use, such as a pair of wireless earphones. And I thought, what if we were able to record audio using just these earbuds and achieve results similar to a dummy head mic? I went online and found some earbuds (Galaxy Buds 2 Pro and Final ZE500) that have similar features but haven't really focused on the recording aspect. I would like to make a functional prototype of this.

Joshua Thomas Chelakkattuparambil

Audio reactive visuals would be a much more interactive project. The output would vary based on the observer's input. The visual would morph (in size, shape and colour) according to the user's interaction. The colour variations will be based on the Camelot wheel, which is a visual tool commonly used by DJs to help with harmonic mixing. This interactive medium would be made through the software called Touchdesigner. The idea was inspired by art installations at the Klanglicht Festival.

Purpose of the project

My main objective through this project is to explore and understand the various nuances of immersive audio and to figure out the various applications. Through this I also learn to implement concepts in a unique way.

I would also learn unique skillsets for each specific project:

- Storytelling: Character building, Narratives, Atmosphere and Ambience
- ASMR: Better understanding of perception and psychoacoustics
- Recording Earbuds: Learning various components of an audio transducer and assembly
- Audio Reactive Visuals: Programming, Visual Generation, Implementation

I believe there is a lot of potential in immersive audio. It is a vast field which can be explored even further. At the moment, it is heavily used in media, music and video games. Waiting to see how it evolves in the future.

Process and Techniques

I have narrowed down as to what the process and workflow could look like for each project:

1. Application of immersive audio in storytelling

- Research on immersive audio applications in narrative structures
- Analysis of story and sound design elements
- Design methodology (case studies, experiments, listener studies)
- Data collection (visual and audio analysis)

- Data analysis and interpretation
- Discussion of findings
- Documentation

2. Relationship with ASMR and Binaural audio

- Research and review on ASMR, Neuroscience, and Binaural audio
- Identify ASMR triggers and recording methods
- Conduct listening experiments / psychoacoustic studies
- Collect and analyze listener response data
- Interpret results in relation to ASMR effectiveness and binaural techniques
- Discuss implications and limitations
- Documentation

3. Custom made earbuds for recording immersive audio and creating distinct sound profiles

- Research existing earbud technologies and transducers
- Select microphone and driver components
- Design planning for hardware and signal processing
- Prototype assembly and testing
- Analyze recording quality and sound profile data
- Iterate design based on results and improve
- Findings and potential applications
- Documentation

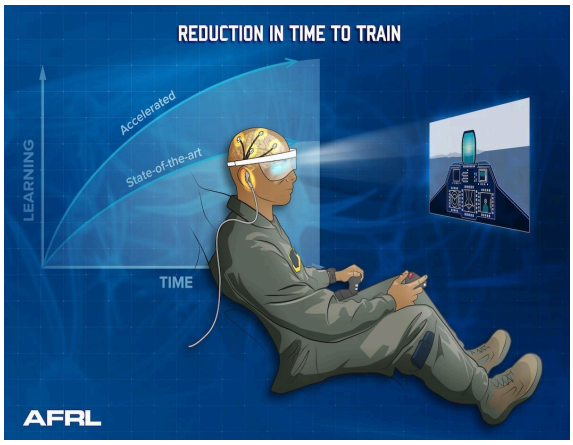
4. Creating immersive audio reactive visuals for binaural audio

- Sketchout visual concept and define sounds to be used
- Mapping audio features to visuals using Touchdesigner
- Do additional programming (if necessary)
- Testing and optimization
- Conduct experiments / simulations with participants
- Collect and analyze data on visual/audio perception or engagement
- Interpret results and evaluate effectiveness
- Discuss findings, limitations, and future work
- Documentation

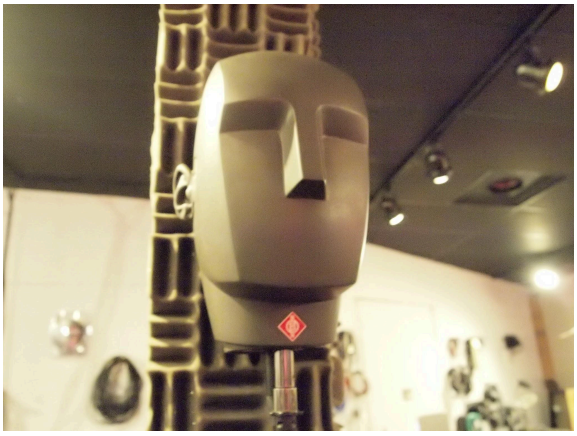
Potential Challenges

- Lack of technical knowledge for assembly
- Lack of advanced programming skill
- Lack of equipment or resources

References

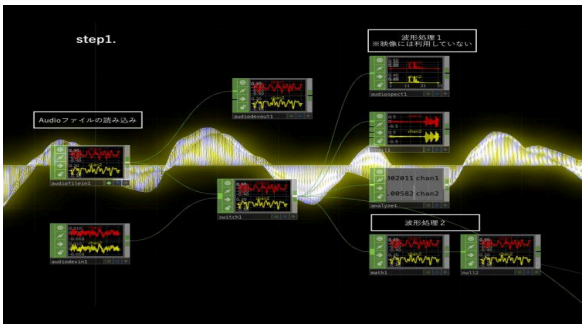


[Immersive Audio in Storytelling]



[ASMR & Binaural Audio]

[Immersive audio recording earbuds]



[Immersive audio reactive visuals]

Joshua Thomas Chelakkattuparambil