Results of Experiments with New Technologies

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# Our Experiments

For the Course New Technologies, we conducted two experiments.

The first experiment was with the ManusVR Gloves. We wanted to make a virtual piano that was controlled by the ManusVR Gloves. However, after a few weeks we found that the HKU did not have a developer licence and that we could not make this project.

The second experiment was a music VR based game. We wanted to make a VR experience where the player would move on the beat of the music. This project we did finish and we were able to make a prototype. We will explain this concept in this report.

# Motivation for the concept

For the concept we were really thinking towards a rhythmic Virtual Reality experience. After coming up with several concepts - we discussed that it should be a game in a techy/space world where you could dance to the music. Our concept is not based to score points, but to immerse in a different reality with different rules. The inspiration and rules in the digital world came from the movie TRON. Our goal for this project was to create an immersive rhythmic game in VR that won’t get you sick!

# Design Choices

## Block Spawn

Because our concept is based in VR and generates blocks on the beat; we needed a script that would act like a metronome. The metronome script is called ‘OnBeat’ and it gives flexibility on what musical section we instantiate different objects.

The blocks are spawned by a script that ‘randomizes’ its position. It hovers around the player. By doing so the position of the blocks that are generated on the beat come from multiple positions.

We added particle effects to the blocks that got hit; we had to tweak the amount of effect lower because the effect would make people nauseous.

Position of the blocks that are spawned are improved in the latest version. This will improve the excitement and replay ability of the game as the blocks spawn in multiple places on ‘random’ positions. We changed the static wall into a fully immersive abyss. With moving blocks all around, this was important as it was ‘too boring’ when blocks were only spawning from one position.

## Background

During the begin period we added a moving background to the game but this didn’t work that well. Much motion sickness after testing that out. We got rid of the moving background.

## VFX

Added particle effect on some blocks that will ‘explode’ so we have more variation of the outcome of different blocks. This came out of tests we did that people would play for only 2 minutes.

## Visuals

About the visual part, we choose a high color contrast between the blocks inspired by Tron and a Tokyo neon lights setting. The visual has the purpose to immerse the player into an artificial place and to captivate its attention while playing the game. The visual and the music works hand in hand to build an sci-sfi atmosphere.

## Music

We wanted to use techy sound for the game. We tried samples of Erick Kempnich - Zoar and other techno tracks. Finally we asked Fabian Hendrix (M&T) to create a track for us for this game based on the Erick Kempnich - Zoar example.

# Technical Difficulties

For this project we needed a library to connect and handle interaction with the VR Kit. However there is very little documentation available. We found the Steam VR plugin online, but it didn’t work at first. This was because no documentation online told us we also needed to install the Steam VR Program, to make the plugin work. After we had that set up, we needed to handle interaction. Online we found the VRTK, but when we tried to implement this it gave only errors. Not even the test scenes worked. Later we found out that that was because of a newer (unsupported) Unity version. After a lot of search work, we found that the Steam VR also had interaction scripts, and this is what we used for our project.

# Roles and Tasks

## Anne van Ede

VR Developer

In the first few weeks I mostly looked at the VR support for Unity. I made the Steam VR plugin work and fixed the user interaction for the VR setup. At first this was difficult as a few plugins that were advised on the internet didn't work, but in the end we used the Steam VR plugin for the interaction as well. After that I used Bart's OnBeat script to spawn the blocks, first at a fixed position and later moving along with the script Mick made.

I also made sure that the different coloured blocks Ami made were implemented and spawned. Lastly I implemented the menu at the beginning of the game. Together with my group, I tested the game various times, to test both design choices as well as functional implementations.

## Mick Gerritsen

Developer

First off I helped to get the Manus working. Eventually and sadly we could not make it work. After this I ended up discussing in my team what we wanted to make without the Manus and we came up with a VR game where you need to hit blocks that fall off a wall of blocks. After Anne ended up getting the SteamVR assets right in our scene I helped with testing and tweaking with settings in Unity. In the project I helped my team a few times with fixing engine related things, like strange movement because of rigidbody or lighting settings. With the advice of my team I tweaked the lighting and materials in a way we were content with it. For the final VR experience I have made a script that generates moving prefabs (cubes) at the start of the scene and I made a script that will make the spawner move around the player. At the end I helped to tweak particle systems and adding them to game objects with code. Through I have also tested the game sometimes in the VR room with my team.

## Ami Vornicu

Illustrator and 3D Modeller

On this project I worked mainly on the concept and visual part. On the concept phase I wanted to build an immersive setting for the player that feels monumental and artificial. We first started from the idea of a big wall of blocks that disintegrates block by block. After a few tests we decided that it’s more appealing to be surrounded 360\* and for you to turn around following the blocks while hitting them. I worked on Illustrator for the buttons and theme and in Maya for the environment.

## Bart Slot

Interaction Designer & Sound Design

For the concept I was really thinking towards a rhythmic Virtual Reality experience. I discussed this with the team and after some brainstorming we ended up with a first concept about a rhythmic game in VR. I was responsible for the metronome script ‘on the beat’, a script that would change the background position (we tested this but it would make people sick).

I made voice clips of ‘the system’ and tested the game a whole lot. For the background music I had contact with my good friend Fabian Hendrix. I was the sound actor/designer for the voice lines of the system and I made sure the look & feel was right.