SOLENT UNIVERSITY
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Abstract

Arguably, Sound Design is one of the most important aspects when it comes to films, games and TV. It allows the audience to become more engaged and aware of what is happening on screen and what can be occurring off screen. When creating sound design not only should the sounds be appropriate to their onscreen representations, but the positioning of sounds should be accurate with them. The aim of this project was to find a method that would create the most immersive audio for games using spatial audio.

How spatial audio creates an immersive experience for gamers.
Southampton Solent University, (BSc) Sound For Film, TV & Games. Cameron Duke

Introduction

While sound design in games can help create an immersive atmosphere in video games for audiences it is also important that the positioning of sounds is accurate. This then helps players become familiar where the source of a sound can be coming from and not just identify what kind of noise it is. One method of creating immersive audio, is by using a form of spatial audio. Spatial audio helps create a three dimensional atmosphere for sound allowing listeners to pin-point sounds coming from all around them.

Aims

The main objectives and goals for this project are shown below:

- Find out if spatial audio is easier to detect compared to stereo audio
- What is a more effective audio output, Headphones or Speakers.
- To find out if higher frequencies are more detectable than lower frequencies
- Create different tests to help show these aims

Methodology

When creating my test I had planned to make two parts. The first part was having the sounds panned in more detectable positions and the second part having them panned in more complex positions.

This plug-in helped position the sounds much easier than using any default plug-in. This helped ensure that the sound locations are accurate so that the test had a fair share of results.

I had planned to create a test where audiences would play a level with both headphones & speakers to see if it's easier or harder to detect sounds however it was not possible with Covid being a serious problem at the time.
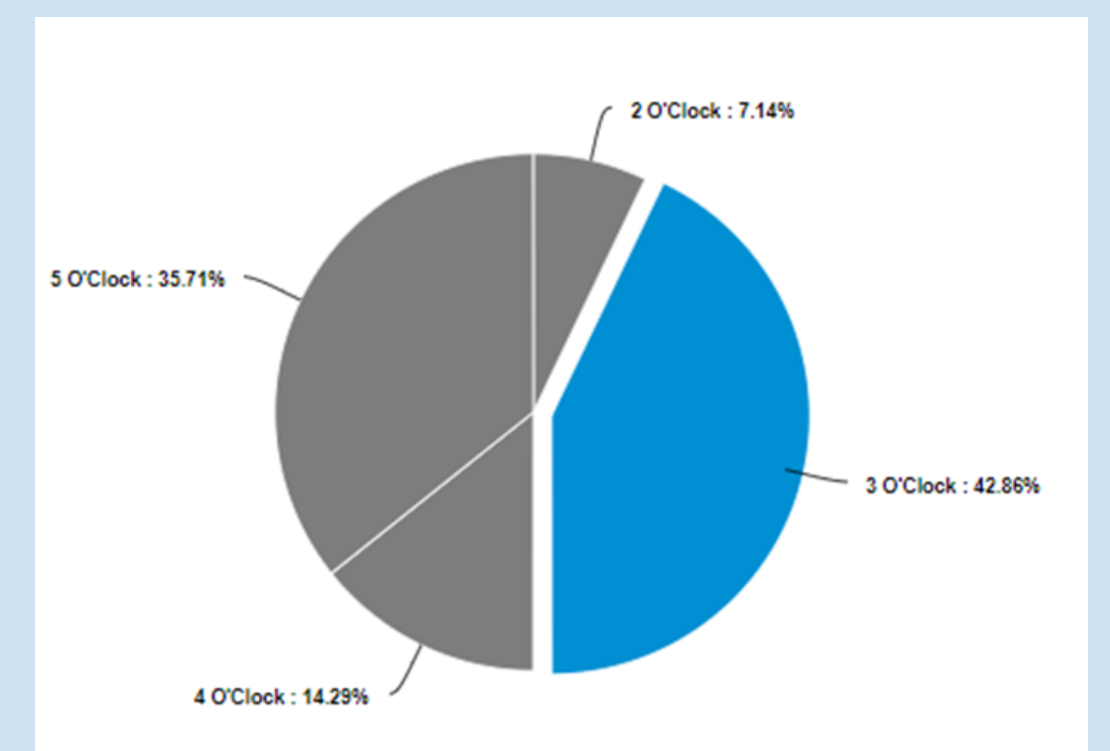
Results

From the results of the test I had 15 graphs to analyse. The first seven **figures** are results from the first test comparing both stereo and binaural mixes. From the first test it was established that audio mixed in a stereo format was easily more detectable when put in simple positions (In front, Behind and to the sides of the listeners).

The Results from the second part of the test were more difficult to compare the results as the participants had often guessed the right direction of the sound source but not the exact area. However it was clear that from looking at **figures** below binaural audio was easier to detect when sounds were mixed in complex angles than to stereo.

(**Figure 9**, Bear Test – binaural back right)

2 O'Clock : 7.14%
3 O'Clock : 21.43%
4 O'Clock : 7.14%
5 O'Clock : 64.29%
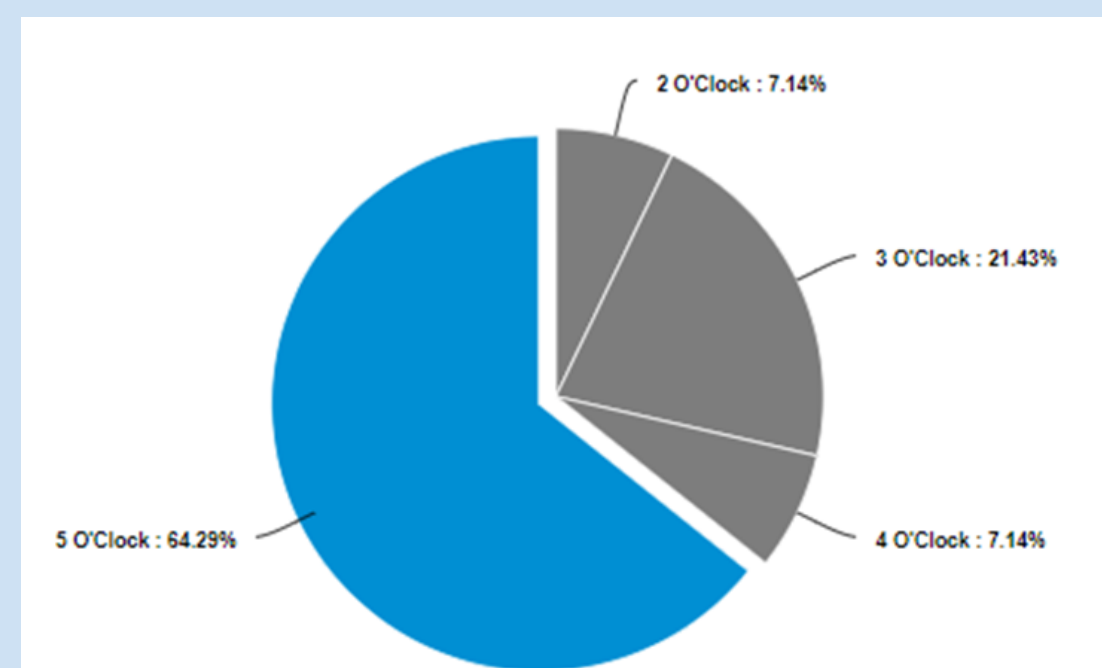
(**Figure 12,** Bear test – stereo back right)

2 O'Clock : 7.14%
3 O'Clock : 42.86%
4 O'Clock : 14.29%
5 O'Clock : 35.71%

Conclusion

Looking at the data that was shown to me I personally believe that two goals were accomplished during this test. The first being if spatial audio is easily detected compared to stereo audio and from the data I was able to acquire it shows that. Although I was unable to create my speaker vs headphones test, using existing research I was able to find out that headphones are the better option for gamers as it helps cut off external noise and feeds sound right into the ears of the players.

Alongside my own method of research it was also discovered that spatial audio is the best method of experiencing games. It allows a player to fully understand where potential threats and friendlies can be within a game just by hearing them. Developers are even adding features within games like HRTF (Head-related transfer function) to further enhance a players experiences.

References

- VALORANT, March 30 2021. HRTF (Head Related Transfer Function) Demo – VALORANT. [18 April 2021] available from: https://www.youtube.com/watch?v=wfsqsLZwREU
- Abbey Road Studio, Published date unknown. Spatial audio [18th November 2020] Available from: https://www.abbeyroad.com/spatial-audio
- IEEE, James Broderick, Jim Duggan, Sam Redfern, 2018. The importance of spatial audio in modern games and virtual environments. [3rd April 2021] Available from: https://ieeexplore.ieee.org/document/8516445
- Jez Corden, 15th September 2017. Does wearing a headset lead to a better overall gaming experience? [6 April 2021] Available from: https://www.windowscentral.com/does-wearing-headset-lead-better-overall-gaming-experience