

Sound Design as an accessibility tool in video games

Authors: Janko Zorbas, Dan Pumnea

Thesis: 20 higher education credits

Program and course: Games and Entertainment Technology Programme / Capstone

(SPO2161)

Level: Bachelor

Semester/year: Spring term 2025

Supervisor: Steven Thomas Ford

Submission date: -

Number of pages: - / -

**Abstract**

Capstone Thesis: 20 higher education credits

Games and Entertainment Technology Programme / Capstone

Program and course: (SPO2161)

Level: Bachelor

Semester/year: Spring term 2025

Supervisor: Steven Thomas Ford

Keywords: Sound, design, accessibility, visually impaired,

Purpose:

Project: We are using a mixed-methods approach for research, combining both quantitative and qualitative research methods. This helps provide a more complete understanding of how sound design can improve video game accessibility for visually impaired players. The quantitative part involves a survey to collect general information about visually impaired players’ experiences with sound in games. The qualitative part includes playtesting and interviews, where participants test a game prototype. In addition, we are build a prototype

1. Introduction

Video games are growing and with that, the demand for them to be accessible is growing as well. /\*There is an emerging need for games to be accessible to different people with different needs and capabilities.\*/ Inclusion of people with disabilities is always positive and one area which is often overlooked and could be discussed more is sound design. Sound design could help retain players with visual impairments who would otherwise have to rely solely on visuals to help them or would stop playing all together. Sound design as a tool is not just about music and sound effects, it's so much more. It is about carefully considering the player's needs and then tailoring to them so the player can be helped in understanding the game mechanics and other elements of the game in an immersive way.

Most of the time, the difficulties faced by visually impaired players tend to be solved through visual techniques. This includes color palettes, contrasts, and adding more visual elements. Often, this is not enough, and with the addition of too many visual elements, the content can become overwhelming. Through this project, we are not trying to replace visual elements with sound elements and sound design, but we want to find ways to incorporate them and have them work in tandem.

4. Description

This section details how we used the sound as a design and accessibility, as well as a brief description of the FPS MOOD prototype we developed in Unity to test these implementations. Before integrating our sound design, we decided a survey would be a great way to identify common problems visually impaired people face when gaming and make note of their suggestions on how audio cues could potentially better their gameplay experience.

After analyzing the gathered results from the survey and reading existing research on audio-based accessibility in other games, we implemented sound effects which were designed in a way to help visually impaired players play the game more easily. We also implemented regular sounds where we thought those were needed instead of specially crafted sounds tailored for the visually impaired. These features were put into the MOOD prototype and tested by participants from the original survey. We conducted a follow-up survey after playtesting to determine how effective this type of audio design was in improving their experience and to what degree it impacted the player’s ability to play the game. With this approach we aim to explore how sound can be effectively used to create a better gaming experience for everyone.

|  |  |  |
| --- | --- | --- |
| **The sound used** | **The role of the sound** | **Where in the game is the sound used** |
|  | The sound is designed to create ambiance and indicate the type of environment you're in. | It is always playing in the background. |
|  | The sound is designed to help the player understand when he is out of ammo. | It plays whenever the player tries shooting the gun and there are no bullets left. |
|  | The sound is designed to let the player know that he is reloading a pistol. | It plays whenever the player decides to reload a pistol. |
|  | The sound is designed to let the player know that he is reloading a rifle. | It plays whenever the player decides to reload a rifle. |
|  | The sound is designed to alert the player to enemy fire, distinct from the player's shot for clarity. | It plays whenever the enemy is shooting at the player. |
|  | The sound lets the player know he/she is shooting a pistol. | It plays whenever a pistol is shot. |
|  | The sound lets the player know he/she is shooting a rifle. | It plays whenever a rifle is shot. |
|  | The sound is used to help player understand that he/she picked up an ammo box. | Anytime the player picks up an ammo box. |
|  | The sound is used to help the player understand that he/she picked up a keycard. | Anytime the player picks up a keycard. |
|  | The sound is used to help the player understand that he/she picked up a health box. | Anytime the player picks up a health box. |
|  | The sound is used to tell the player a key card has been used successfully. | Anytime the player interacts with a keypad and has a key card on them. |
|  | The sound is used to tell the player a key card has been used unsuccessfully. | Anytime the player interacts with a keypad and does not have a key card on them. |
|  | The sound is used to indicate a gate is being opened. | Anytime the player opened a gate successfully. |
|  | The sound is used to indicate the player successfully defused the nuke. | When the player completes the game successfully. |
|  | The sound is used to indicate the player lost the game. | When the player doesn’t finish the game on time. |
|  | The sound is used to tell the player he/she died. | Anytime the player dies. |
|  | One of many sounds that indicates to the player he/she is moving. | Anytime the player moves. |
|  | One of the sounds that indicate to the player is that the enemy is moving. | This 3D sound plays at enemies’ feet whenever an enemy is moving. It is audible only when the player is close to an enemy |

4.1 Sound Implementation

The process of implementing the sounds was a little different from regular. Instead of just putting in sounds, we had to carefully think how these sounds are going to be perceived by someone who can’t see that well. With that in mind, we had to add some sounds that one might not typically find in a video game.