

# **How can action games accommodate for hearing impaired gamers regarding conveying information?**

**COMP160 - Software Engineering Essay**

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Video games have been regarded as a major source of entertainment for countless of people. However, it has proven difficult for impaired individuals of varying kinds to enjoy or even play said games. As a result, this paper will analyse and address the various methods that can be implemented in action games to accomodate for hearing impaired gamers, both to improve their experience and generally provide more accessibility for a wider range of players. This will be done with aid from previous studies and by discussing potential alternatives, as well as how they can be implemented.

## **1 Introduction**

It is easy to forget the importance of adapting games into meeting specific needs. While the majority of current games' visual and auditory qualities have improved over time, the same cannot be said for their accessibilities.

Game accessibility involves creating features and strategies that aid impaired individuals' game experience, being able to truly play games even when under limiting conditions [?]. Indeed, older existing games such as Half Life 2 [?] and Mortal Kombat provide all kinds of visual and auditory feedback. As a result, one would think that current games would have expanded on them and increased the amount of accessibility options. Unfortunately, this is not the case for the majority. Therefore, this paper aims to analyse and discuss relevant strategies from previous research regarding the hearing impaired, such as interaction feedback, communicating threat, etc. [?], which will feed into the conclusion of the research question. Additionally, this paper will focus primarily on action games, and explain the varying options they can provide to aid hearing impaired players in having an enjoyable and immersive experience.

## 2 Strategies

Various strategies and classes that exist in games such as Half Life 2, among others, have been discussed. These contain examples such as sound volume, speech, timbre and their complementary sides which involve interaction feedback (informing the player that an action was completed), communicating threat (informing the player of nearby threats), and characterization of game elements (distinguishable sound sources) [?]. These can be used to evaluate a game's auditory framework and can serve as basic guidelines for game developers to determine how they can make their games as accessible as possible for the hearing impaired. For instance, regarding **interaction feedback** in Half Life 2, the player understands that various events, such as bullet impacts or enemy movements are occurring through the **timbre**, which helps the player distinguish between the two events which allows them to perceive

and understand what is happening around them. **Communicating threat** is another important strategy. A relevant example taken from Call of Duty: Modern Warfare 2, where the player is informed of an imminent grenade explosion by the use of speech and redundancies, both by showing them a grenade icon indicating its location and character dialogue yelling at the player to “*Get down!*”, although the latter not being as reliable for the hearing impaired. [?]

Write the main body of your essay here. Add more sections if appropriate. You may choose to write about each of your three papers in its own section, or you may choose a different structure. Either way, remember that you are being assessed on technical insight and analysis: it is not enough to merely summarise the contents of the three papers. You must demonstrate the ability to make inferences beyond what is written in the papers, and to draw the three papers together into a single coherent narrative.

Your essay must make a clear recommendation, in terms of which of the three techniques you have reviewed is the best according to whichever metric or metrics you feel is most appropriate. You must justify your choice, backing it up with empirical evidence. However remember that an academic essay is not a murder mystery: you should already have briefly discussed your recommendation in the introduction and in other parts of the essay. Do not save it for a grand reveal at the end.

### 3 Recommendations

- \* Audio cues

- \* Subtitles or closed captions

## **4 Conclusion (definitely wip)**

Write your conclusion here. The conclusion should do more than summarise the essay, making clear the contribution of the work and highlighting key points, limitations, and outstanding questions. It should not introduce any new content or information.