**Kirk Hogden**

Supervisor: **Nuno Palmeiro Otero**

Due **January 15th 2024**

**Adaptive Soundtracks in Video Games**

URL: **Insert your web address here (if applicable)**

Word count: **Insert number**

A dissertation submitted in partial fulfilment of the University of Greenwich’s

**BSc H GAMES DESIGN & DEVELOPMENT**

Abstract

Throughout the report template placeholder text has been provided which provides tips on what to include in each section. Please delete all placeholder text including this and replace it with your own text about your project (you can keep a copy of the original template to refer to the advice if needed).

The required wordcount for this report is 6000 words +/- 10%, excluding the title page, acknowledgements page, content page, references, tables and figure captions, and appendices.

Use a standard font e.g. Times New Roman in size 11, and 1.5 spaced text. If needed, code can be presented in Courier New font. You should use line breaks to indicate paragraphs.

Main sections should be numbered 1., 2., 3., and subsections should be numbered 1.1, 1.2, 1.3 etc. If needed you can use the ‘word styles’ to maintain formatting of headings and body text consistently.

You can update the contents section by right-clicking on it and selecting ‘update field’.

It is possible to adapt the section and subsection titles in the template to suit your project (and in some cases you will need to do this). Please discuss any changes with your supervisor.

Use author-date Harvard-style referencing.

This section is the abstract. The abstract provides a summary overview of your project. You should outline what the project is about and what will be covered in the report. This section should be approximately 200 words.

Acknowledgements

This project has received attention and much support from it’s supervisor Nuno Palmeiro Otero, who gave many ideas on how to get the best out of research in this project. Participants have also made this project possible and their participation in research is much appreciated.

Thank you to everyone who assisted in this project.

Contents

Abstract ii

Acknowledgements iii

Contents iv

1 Introduction 1

1.1 Background 1

1.2 Research aim and objectives 1

Objective 1. E.g. Investigate related work such as literature and products. 1

Objective 2. E.g. Design a prototype based on the outcomes from objective 1. 1

Objective 3. E.g. Develop a prototype based on the outcomes from objective 1. 1

Objective 4. E.g. Evaluate the prototype using an appropriate methodology. 1

2 Related Work 2

2.1 A key area of related research 2

2.2 Another key area of related research 2

2.3 Existing products related to this project 2

3 Product Design 3

3.1 Proposed product design 3

3.2 Proposed product features 3

4 Product Development 4

4.1 Development of a key aspect 4

4.2 Development of another key aspect 4

4.3 Development of another key aspect 4

5 Evaluation 5

5.1 Methodology 5

5.2 Results 5

5.3 Discussion 5

6 Conclusion 6

7 References 7

Appendix A - Ethics Forms 8

# Introduction

## Background

Audio has been a fundamental element for video games since the first ever game titles. Tennis for Two used audio queues throughout gameplay in 1958. It often plays when interaction takes place, such as when the player presses a button, or their character collides into something. (Pute & Pasquier, 2020)Music is a form of audio, and the focused type in this report. It amplifies the viewer’s emotional responses when consuming media, whether that is movies or in this project’s focus: video games. (Pute & Pasquier, 2019)

There are three types of soundtracks that video games may include. The most recognisable is linear, which simply plays a piece of music from beginning to end before looping. With nothing more, linear is a simple form of music. It lacks the additional features to make the soundtrack interesting but possesses less risk of sounding unpleasing which makes it the most popular method. Adaptive soundtracks is another method where music changes in response to events that happen within the game. It has received the alternate name interactive music due to this reason as often these changes are to make the music match how the player may be feeling. These changes could be for example, a layer may be added or removed, or the tempo takes a turn. Lastly, generative soundtracks is the most advanced. Generative music is computer-generated, not only adapting with situations to guide user emotions, but is never-ending. (Pute & Pasquier, 2020)

A problem in the game industry is that many studios still choose linear soundtracks over adaptive or generative music, despite the advantages that they carry to increase gameplay experience. (Pute & Pasquier, 2019) It is expensive to compose adaptive music for a game, compared to linear. Because linear music however is a looping audio, it begins to become repetitive for players listening over time which destroys the immersion. (Pute & Pasquier, 2020) When technology is evolving for games ever since it’s early-debuts in 1958, it makes sense that music should take a step forward in advancing too.

## Research aim and objectives

**Project aim:** To solve the issue of repetitiveness in videogame music through improving soundtracks.

# Objective 1. Discover what methods can be used inside a game engine through literature reviews.

Reading through literature reviews gives better insight onto the problem, giving an idea of the current state-of-the-art and seeing how this project can use the work of others to find a solution in improving video game soundtracks.

# Objective 2. Design/develop a prototype game that will be used as the proposed solution in research.

The proposed solution will be a video game that contains linear and adaptive (or generative) soundtracks. It will be toggleable on what form of soundtracks play. This is ideal for a between-groups study where one group plays the game with linear music, whereas the other plays with the alternative option.

# Objective 3. Develop the final build with the desired soundtrack methods implemented.

Using either Unity or Unreal Engine, the design prototype will be developed into a final build. To make sure in-game music has a reasonable impact on player experiences, music assets will have to be either borrowed or purchased online.

# Objective 4. Have participants play through the final build to collect primary data.

Participants will be invited to partake in research before consenting. In a between-groups study, one set of participants will be requested to play the game with the setting that it plays linear music. Another group will play the game with adaptive soundtracks. For both sets, participants are required to put on hardware, such as a heartrate monitor and headphones. A webcam will be used to collect facial readings. When the participant has finished playing the game, they are asked to complete a survey which will allow them to answer questions on how they may have felt emotionally during gameplay. Each participant’s data is kept and recorded for research.

# Objective 5. Use primary data to see which method of soundtracks has a better impact on emotions.

Using readings from hardware and survey answers by each participant, data will be used to tell which method of soundtracks had a better impact on emotions.

# Related Work

## A key area of related research

This chapter should be approximately 1350 words. This chapter should provide a literature review and product review to establish related theories and the state of the art for the area you are investigating. This background work should provide the context for your product and inform the approaches taken with your practical work.

This section should outline relevant research for one key area related to your project. Change the subsection title ‘a key area of related research’ to one that makes sense for your project. Avoid using quotes where possible. Summarise key theories in your own words and explain how they specifically relate to your project.

## Another key area of related research

Here you should talk about another related area. Change the subsection title ‘another key area of related research’ to one that makes sense for your project.

## Existing products related to this project

In this subsection you should analyse existing products related to your area of interest. These might be commercial products such as games, VR or digital media artefacts related to your area of investigation. You should consider factors such as the specific technologies and approaches used by these existing products as well as the user experience they provide.

The most notable product similar to this project’s proposed solution is Galactic Escape. This was a proposed solution found in one of the literature reviews of this project. Galactic Escape helped in reading tension that participants gave off while music played. (Pute & Pasquier, 2019)

# Product Design

## Proposed product design

This chapter should be approximately 650 words.

In this section you should describe your design for the product. It is usually helpful to use images and/or diagrams to communicate key feature of your design for the product. Images should be centred and formatted ‘in-line with text’, with a figure caption below and callout in the main text e.g. “Figure 1 shows…”.

A blue rectangles with black background

Description automatically generated

**Figure 1**: This is a legend. Caption to go below figure.

If needed you can refer to appendices for other preliminary design work such as storyboards or sketches. Appendices do not count towards your word count. Use a callout for appendices e.g. “for preliminary design sketches, see Appendix B”.

## Proposed product features

In this subsection you should provide a table or list outlining your intended features for the product. It is often helpful to do this using a MoSCoW table. Tables should be presented with a caption above. Use a callout in the main text for the table e.g. “Table 1 shows…”. Text in tables does not count towards your word count.

**Table 1**: This is a legend. Caption to go above table.

|  |  |
| --- | --- |
| **Feature** | **MoSCoW Rating** |
| Text | Text |
| Text | Text |

# Product Development

## Development of a key aspect

This chapter should be approximately 1350 words. In this section you should describe the development of your product based on your designs. Describe the development process undertaken, giving specific details of what you did and why, as well as any technical problems you encountered. You can use subsections to divide your discussion into key areas of your development work.

Remember that in this chapter you can also use figures such as screenshots or tables to show your development work or highlight key areas you have worked on.

## Development of another key aspect

This subsection would look at some distinct area of your development work.

## Development of another key aspect

This subsection would look at another distinct area of your development work.

# Evaluation

## Methodology

This chapter should be approximately 1350 words.

In this section you should explain the evaluation methodology used to test your product. What user testing did you carry out? How did you recruit participants? How many participants were there? What did you ask them to do? How did you record the results? You should also briefly refer to ethical procedures you followed and place any participant consent forms and information sheets in an appendix.

## Results

In this section you presents the results of your study. You can use figures/charts and/or tables as needed.

## Discussion

In this section you should discuss and interpret the results of your study. What did you learn from the evaluation about your product which was successful or could be improved in the future?

# Conclusion

This chapter should be approximately 650 words. Here you should summarise the outcomes of the project in relation to your original question. Refer back to your project aims and objectives. Give a summary of what was carried out, what the outcomes were and what was ultimately learned. Point towards the wider relevance of the work you carried out for related investigation in the future.

# References

References should be ordered alphabetically by the name of the author (or, if there is more than one, the name of the first author. The Harvard system is used. Each reference should state the author’s name and initials, date (in parentheses), title, publisher and place of issue (if known) e.g. Seber G.A.F. (2003), Multivariate Observations, John Wiley, New York.

If the reference is to a journal or to a conference proceedings article, then the journal title, volume, number and page numbers should be added, e.g. Parna s D.L. et al (2001), Evaluation of Safety Critical Software, CACM, Vol. 33, No.6, pp. 636-651.

Using internet sources you should add the word “online” in brackets after the title of the work, plus the URL after the name of the publisher.

1. Ethics Forms

You can use one or more appendices to provide any supporting/supplementary information related to your project. Appendices are ordered using letters (A, B, C…). These can include detailed and technical documentation such as table of results, diagrams, program source code, etc, which are essential parts of the project but not directly a part of the main discussion in the report. All contents of appendices should be exclusively, products of the student’s own work.

One appendix you should include is ‘Ethics Forms’. In this appendix you should copy in your information sheets and consent forms, unless you opt to upload these as a separate zip file on Moodle. It is possible to use other appendices for key examples of code, preliminary design work or other relevant material. Please discuss with your supervisor. Appendices do not count towards your word count.