DL838 BA (Hons) Creative Music Production
Professional Project

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Immersion Through the Soundscape: How Sound and Music Can Aid Audience Immersion in an Animated Short

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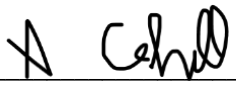

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Abstract

"Immersion Through the Soundscape" looks at how sound and music helps to aid audience immersion in media. Previously working on sound design and music for short films created an interest in how exactly sound and music works alongside the visual storyline. This project focusses on the specifics how sound and music can be used to influence an audiences' perception of a piece of media. The project focusses on the development of the soundscape for an animated short film. The workflow for this project was broken down into three key phases; Pre-Production, Production and Post-Production. These details of these phases can be found in the Methodology chapter. Each section explores the elements that contribute to that phase of the production cycle. Continuing on from this, validation of the work discussed throughout these sections can be seen in the Survey section of the Methodology. The results of said survey are analysed and discussed within the Analysis and Discussion chapters. The aim of this is to fully evaluate how and why the audience were immersed in the film itself.

Introduction

"Soundscape is the acoustic environment of a place, as perceived, experienced, and/or understood, whose character is the result of the action and interaction of acoustic, non-acoustic and contextual factors."[1] "Immersion Through the Soundscape" dissects the many aspects of the soundscape, including dialogue, sound effects and foley, Atmos and music and how they work together to create an immersive environment, surrounding the listener. The aim of this thesis is to answer the question of how sound and music can aid audience immersion in a short film. This paper details the process behind the production of a short film, in which an immersive soundscape; containing dialogue, foley, sound design, Atmos and music, will be produced. Divided into four main chapters, the Methodology section follows the film through pre-production, production and post-production, detailing the steps taken to build a convincing soundscape, from pre-production planning, orchestration and design, and recording and mixing sound effects, location recordings and musical elements, to post-production mixing. As well as this, the Methodology tests the effectiveness of the work, based on audience feedback. Moreover, the Literature Review delves into the specifics of producing an immersive sonic experience. From how sound design informs the narrative, to the psychology behind sound design in visual media, the literature review covers a number of topics related to the research question.

Literature Review

Sound as a Narrative Device

To begin, it felt apt to start researching the role of sound as a narrative device in both film and interactive media. This led to "The Role of Sound in Inducing Storytelling in Immersive Environments" (Salselas, Penha). The journal discusses sound design in the context of an immersive audiovisual experience. It explores how to effectively maintain the audiences' attention in interactive media, where they have complete agency over "what plan or

[1] Mitchell, Andrew, Aletta, Francesco, Kang, Jian, Oberman, Tin. "How Do We Define Soundscape?" Institute for Environmental Design & Engineering, The Bartlett, University College London, UK (2023).

character to follow”[2]. The journal gives an insight into factors that contribute to sustaining an audiences’ attention through sound, while providing a comprehensive definition of immersion, using both technical and metaphorical definitions. In the journal, the authors aim to evaluate how sound design and audio stimuli can "alter and enhance" a viewers' perception of a visual experience. Throughout the journal, the authors dedicate an entire chapter[3] to defining immersion. They describe their definition of immersive sound design being an "invisible agent” that helps the audience navigate their surroundings. The article aims to explore the ways in which sound can be used to subliminally guide the listener, such as through evoking strong emotions in the viewer. Stating that "immersion is a metaphorical term derived from the physical experience of being submerged in water.” They discuss how emotions can impact a viewer’s attention, as emotionally evaluating a situation is more consuming for the brain, this helps the audience to subconsciously become immersed in the media.

Additionally, “Sound Design in VR Filmmaking: Opportunities and Challenges in a New Medium” (Manolas, Panos) also covers the topic of immersive sound design. This journal discusses immersive sound design in VR filmmaking. It examines how new mediums can change current filmmaking methodologies. In this paper, the researchers aim to evaluate the opportunities that VR media creates for modern filmmaking, as well as assessing the challenges that come with it, such as how audiences’ expectations of regular cinema can limit creativity. Furthermore, the author presents possible methodologies for future sound designers working in the field. An example of this is proposing a 180 degree sonic landscape, with auditory cues being used strictly within 180 degrees of the player’s view. The researchers also includes a general breakdown of the creative process of producing a soundscape, this allows for a better understanding of the authors’ knowledge of the medium.

Overall, both “The Role of Sound in Inducing Storytelling in Immersive Environments” and “Sound Design in VR Filmmaking: Opportunities and Challenges in a New Medium.” establish the importance of sound design in aiding the narrative in visual media. Both journals are effective in outlining ways in which audio can be used to enhance user experience in immersive media. While “The Role of Sound in Inducing Storytelling in Immersive Environments” is effective in defining immersion within the context of the research question, “Sound Design in VR Filmmaking: Opportunities and Challenges in a New Medium.” is effective in giving a brief history of VR, and how it has made its way into the film world, as well as outlining the limitations of both traditional screen media and VR, and how they can be solved. Overall, the articles outline a number of factors that will be accounted for while building the sonic landscape for a short film.

Psychology and the Influence of Sound on Audiences

A more psychological standpoint is seen in the conference paper “Exploring the Influence of Multichannel Soundtracks on Film Immersion.”(Williams, Francombe, et al.) The research being conducted directly addresses this project’s research question. The paper discusses

[2] Salselas, Ines, Penha, Rui. “introduction”, “The Role of Sound n Inducing Storytelling in Immersive Environments.” September, 2019.
[3] Salselas, Ines, Penha, Rui. “Characterising Immersion”, “The Role of Sound n Inducing Storytelling in Immersive Environments.” September, 2019

how 7.1.4 and 5.1 sound systems can differ from 2.0 sound systems in terms of audience immersion. The paper investigates how audiences interact with each setup.

It is evident that the researcher aimed to assess whether additional speakers would enhance an audience's experience of a short film. They aimed to gather this information from the auditory and visual experience alone, wishing not to rely on the narrative too heavily for audience retention. The researcher planned to gain further insight into the participants' experience through a questionnaire. To add to this, the paper discusses areas of the film that could be emotionally provoking, and how that might impact the audiences' experience, which ties the research in with "The Role of Sound in Inducing Storytelling in Immersive Environments". As well as this, the paper gives a technical breakdown of how each mix differs from the other, this helps to further understand the audiences' experience, and in turn can help guide future filmmakers when mixing in 5.1 and 7.1.4.

"The Role of Sound in the Immersive Experience"(Curtis-Sklodowska) gives further insight into the psychological aspects of this subject. This paper further discusses and defines the idea of immersion. The author explains how psychology can be used to enhance sonic experiences. This includes information on the psychological implications of auditory immersion, and how a person's brain responds to certain sounds.

In this paper, the researcher aims to explore the factors that immerse a user in computer generated content. They do this by examining the psychology behind the musical and sonic elements that induce a feeling of immersion. Additionally, they highlight the importance of production, how well thought out direction, use of specialisation and reverberation can be used to create an effective soundscape. The article also introduces the BRECVEMA framework[4], which evaluates human perception of sound, the ability to recognise patterns in sound, and how it can be applied to sound design.

"Exploring the Influence of Multichannel Soundtracks on Film Immersion" is also extremely informative in relation to psychology and sound design. The researchers provide the methodology behind formulating a questionnaire for this experiment. As well as this, they dedicate a large section of the paper to the discussion of the results of the questionnaire, and how this could be implemented in the future. This information prompted further research into measuring emotional response in audiences. This led to "The Emotionality of Sonic Events: Testing the Geneva Emotional Music Scale (GEMS) for Popular and Electroacoustic Music." (Lykartsis) This paper verifies the legitimacy of GEMS 25[5] scale, which provides a point of reference for researchers looking to measure listener emotionality in relation to music. This paper focuses on the ways in which an audience can be assessed on their emotional perception of a piece of music, which aligns with the objective of the survey for this project. In the paper, the audiences' emotional perception is assessed by having the audience use the GEMS 25 scale to describe the songs played. The work is

[4] Curtis-Sklodowska, Maria. "The Role of Sound in the Immersive Experience." AVANT, Vol. XIV, No. 3, July 2023 p. 6.
[5] "GEMS", Musemap. https://musemap.org/resources/gems. n.d.

effective in reaffirming the use of the GEMS 25 scale to gauge emotional perception. The paper also provides a copy of the GEMS 25 scale, which can be used for future reference when surveying.

To conclude, the authors of both “Exploring the Influence of Multichannel Soundtracks on Film Immersion” and “The Role of Sound in the Immersive Experience” effectively outline their findings, while also providing resources for further research. “The Role of Sound in the Immersive Experience” is effective in establishing a clear but diverse definition of immersion, and how it applies to the research question. The information included in the "Concept of Immersion"[6] chapter in particular can be used to further research. The journal works as a good introduction to the BRECLEVA framework, which ties the psychology based elements of the article with the practical elements. The journal does also provide some useful information on sound design, although not as in-depth as what is needed for this project. Additionally, “Exploring the Influence of Multichannel Soundtracks on Film Immersion.” is effective in collecting, analysing and discussing the data gathered, with further information on how this data can be used in the future. Along with this, the information gathered from this paper helps to build upon the foundation established by “The Role of Sound in Inducing Storytelling in Immersive Environments” and “Sound Design in VR Filmmaking”, while the survey aspects of the paper align with the methodologies of “The Emotionality of Sonic Events: Testing the Geneva Emotional Music Scale (GEMS) for Popular and Electroacoustic Music.”

Examples of Effective Sound Design in Media

For this literature review, it felt important to include examples of impactful sound design in cinema. The episode “Sound of Dune” (Green, Whitehead, et al.) from the Tonebenders podcast discusses this. In this podcast, the host interviews Mark Mangini, Theo Green and Dave Whitehead, as they discuss their work on the film "Dune"[7]. The interview talks about how sound can be used as a tool to guide the story, especially in the science fiction genre. The episode discusses the importance of innovation, as well as the importance of accuracy and authenticity in sound design.

Additionally, the interviewees relay how this production compares to other productions they have worked on, as well as how the sound department worked with the picture and editing departments, and how this collaboration was necessary in order to produce the final product. The interviewees describe the building up and breaking down of sounds to find what fits, and the process of creating sounds for objects that do not exist in our world, all while trying to avoid falling into stereotypes. Furthermore, they discuss the use of musical elements, granular synthesisers in particular, and how they were used to build the soundscape. In this episode, they also discuss how the inclusion of language in the soundscape, and how dialogue edit can enhance the narrative.

[6] Curtis-Sklodowska, Maria. “The Role of Sound in the Immersive Experience.” AVANT, Vol. XIV, No. 3, July 2023 pp. 2-4.
[7] *Dune*. Dir. Villeneuve, Denis. 2021.

Another work that displays creative and innovative approaches to sound design is “Nature Manifesto” (Björk), an immersive experience that utilises surround sound. In this project, the artist aims to spread a message on environmentalism using visuals and sound. The artist combines sound with visual effects to create an immersive experience. It provides an example of the role sound plays in an immersive environment, displaying effective use of dialogue, Atmos and sound design. As the artefact for this project will be under ten minutes, the work being short form is an additional benefit.

Overall, both sources convey the idea of putting the theory discussed in the previous chapter into practice. “Sound of Dune” is effective in providing ideas on innovative use of foley, sound design and music to help build the soundscape. Much of the discussion surrounding foley recording and the assembling of individual sound effects will be extremely useful for the production element of the project. Along with this, the discussion on the workflow of the sound designer and supervising sound designers and editors was useful in planning the methodology for the project. In addition to this, “Nature Manifesto” highlights how the elements discussed in previous sources can be emulated in short form content. Björk’s work reflects the desired outcome of the project, while showing the many factors that contribute to an effective, immersive soundscape.

Practical Resources

It felt important to include practical resources in the literature review. The first of which is “A Microphone Array for Recording Music in Surround-Sound with Height Channels.” (Bowles) This conference paper discusses microphone placement for surround sound recording. Additionally, it discusses advances in 5.1 DVD releases at the time, and how cinematic sound for DVD would be a possibility in the near future. The work outlines the author's previous experience in broadcast recording, as well as an overview of previous work in the field[8], and how this influenced their decisions. The researcher aims to discuss the possibilities within surround sound recordings and expand on previous research, primarily on 5.1 recording and distribution. Additionally, the author aims to detail the process in which they experiment with different microphone arrays, using their experience in broadcast as a reference. They plan to assess all necessary elements when recording in surround sound, such as the listening environment, the format of the finished piece of media and the necessary recording equipment and environment.

The author begins by outlining their previous experience and how it influences their decisions when researching. They reference a number of other projects that explore similar areas, from which they draw inspiration as a way to provide a background for the experiment. After discussing in detail the background research to this project, the researcher goes on to present a number of microphone arrays that could be used for surround sound recording. The researcher gives a huge amount of detail into each array, differentiating between arrays where the microphones are all the same versus arrays with different types of microphones were used in the height channels. The specificity of the research is very useful, as it allows for a strong understanding of the research.

[8] Bowles, David. “A microphone array for recording music in surround-sound with height channels.” New York: Audio Engineering Society, 2015. Convention Paper 110. Para. 1.1

The references provided in this journal will be useful if further research is needed in those particular fields. Furthermore, the inclusion of arrays where the height channels use different types of microphones was also useful, as it allowed insight into how different microphone types would perform, as well as the pros and cons of using each microphone type. The information on different microphone arrays, as well as the information on acoustics will be taken note of, although not strictly necessary for this project.

Similarly the "Echo"[9] project provides a more specific set of approaches. The "Aircage" (Wollage) array in particular was studied. The aim of "Echo" was to explore different forms of immersive recording techniques. The project was a collaboration with a number of engineers, producers, composers and the London Contemporary Orchestra on a number of live recordings. This project in particular was chosen due to the unique approach to immersive recording. The "Aircage" array was chosen as the array that best met the facilities already available during production. The aim of "Aircage" was to place the orchestra around the microphone array, using hyper-cardioid microphones to capture a detailed sound. For reference, a diagram containing the microphone setup and recommended measurement can be found in Appendix A, Figure 1. Overall, "Aircage" took the information from "A Microphone Array for Recording Music in Surround-Sound with Height Channels" and applied it to a more modern context, with further details on how one might utilise said information in a practical manner. Both of these journals were essential in providing necessary information for effective execution of this project, allowing for an in-depth insight into both the theory and practical elements of immersive recording.

Methodology

Pre-Production

After establishing a solid theoretical basis, this section proposes a method of execution for the practical elements of this project. The first phase of the project is pre-production. The objective of this phase is to have a concise plan of what needs to be completed during the production and post-production phases. In order to achieve this, a director was identified, and, during a meeting, a collaboration on an in-production short film was agreed upon. In this meeting the aesthetic vision for the film was discussed. This included discussing references for the score and soundscape, examples of which include the films "Aftersun"[10] and "Eternal Sunshine of the Spotless Mind"[11]. Furthermore, the director shared a playlist of reference tracks for the score. Additionally, concept art and a short animatic the director had created were discussed.

From this meeting, the Literature Review, and the feedback received from the project pitch and subsequent mentor meetings, a timeline was created for the production and post-production phases. In January, the project entered production. This involved recording dialogue, foley, Atmos, and any live instruments needed for the score. This was estimated to take roughly six to eight weeks. After all necessary elements had been recorded and edited, the project then entered the post-production phase. This phase included mixing the soundscape and score. It was assumed that this aspect would be more time consuming, as

[9] APL. ECHO Project . May 2025, https://apl-hud.com/echo/, accessed January 2026.
[10] *Aftersun*. Dir. Charlotte Wells. 2022.
[11] *Eternal Sunshine of th Spottless Mind*. Dir. Michel Gondry. 2012

multiple mixes were to be produced. During this period, meetings with the director were crucial, in order to produce a soundscape and score that aligned with their vision. Once a final mix had been produced, the project would then be put forward for audience feedback. The aim of the audience feedback was to assess how the audio aided the audience's immersion in the visual story. The film was shown to two audiences in 7.1.4. After viewing, each audience member was then given a questionnaire to evaluate the auditory factors that immersed them, as well as the factors that they may have found distracting, or that took them away from the experience. Once all of the information had been gathered, the data was analysed and a final conclusion was drawn from this.

Production

Following on from pre-production, the project entered production in mid-January. This phase of the project involved the dialogue, foley, and Atmos recording, as well as the composition of the score, for which a rough draft mix had already been created.

Dialogue was recorded first. Dialogue was recorded using a condenser vocal microphone. This particular microphone was chosen for its ability to capture detailed, high quality audio. Initially, it was planned for the dialogue to be recorded individually by both actors in a vocal booth, with the director and sound engineering communicating with the actor through a talk-back microphone. However, given both actors had backgrounds in theatre, with minimal voice acting experience, it was decided that it would be better to record in the control room. This allowed for the actors to record together, acting against one another, with the director present. This was ultimately a more comfortable option for both actors, and allowed for their best possible performance. During the recording, priority was given to ensuring the actors' could give the best performance, as it was crucial in capturing an authentic performance. This involved more than just line delivery, however, It was important to capture breathwork, laughter and other physical elements of acting, as there were quite a few scenes where the actors were moving around. In order to do this, actors were encourage to act out the physical movements if possible, or try to re-create them as accurately as possible. All of this helped to create a realistic sounding portrayal of the characters.

Once dialogue had been recorded, the next task was comping and editing. The dialogue was comped with the assistance of the director, who gave input on their preferred takes. Once the dialogue had been comped, it was then treated. Plugins such as Dyn3 Compressor and EQ3 were used to help clean up the audio. Supertone's Clear De-Noise plugin was also used to remove slight reverbs caused by recording in the control room.

Polaroids are used almost as a third character in the film, as they are used to tell the story of time passing for the two main characters. As a result, many scenes involve the handling of polaroids, the sounds for which were created using foley. Along with the sound effects for the polaroid photos, a number of other actions that would need to be recorded in line with the animation were identified. The timecodes for which were added to a cue sheet. The objective of the foley cue sheet is to establish what sound effects are needed and where they are needed in the mix. Props such as clothes, water containers, a point-and-shoot film camera and polaroid pictures were used to achieve the sound effects needed for the film. There was little editing involved in this process, many of the effects required some minor

trimming and treatment, such as compression and EQ to achieve the desired sound. Subsequently, the foley was then mixed with the dialogue and score to create a rough mix.

The film relied heavily on atmospheric sound, as the environments of the film played a significant role in the film's narrative. Naturally, this meant Atmos would play a significant role in the soundscape. Due to this, location recording was considered. A few scenes in particular felt as though they would benefit from this. A recording environment that would emulate the atmosphere was identified, and the process of recording location sounds began. A number of recordings were captured, highlighting different elements of the environment. This included close-up, detailed recordings, as well as more general atmospheric sounds. For the sake of ease and efficiency, all recordings were captured on a portable recorder. The location recordings were used to add depth to the already existing soundscape, as well as providing a sound unique to the film.

Alongside the development of the dialogue, foley and Atmos, the score was developed during this time. The score went through three main renditions; the first draft mix, the more developed second mix, and the final mix. The draft mix aimed to give the director of the film a rough idea of the score. The score was heavily inspired by the reference films and playlist outlined in the pre-production chapter. Being a rough draft, the first mix relied heavily on software instruments and midi. After presenting the draft to the director, the second mix was developed in response to their feedback on the scratch mix, implementing the director's notes into the existing score, and enhancing the stronger aspects of the original mix.

In the final mix, the most significant development was the inclusion of a string quartet. Originally created using midi, it was decided that a live string recording would be hugely beneficial to the development of the score. The live recording of the string section was completed in collaboration with the director of a local music school, who assisted in orchestration, as well as in sourcing and conducting the musicians. This collaboration was crucial in producing a piece of music that translated well from the original composition, and aligned with the vision for the score. As the aim of this project is to assess the factors that immerse an audience, the strings were recorded using an immersive microphone array, similar to "Aircage"[12], which was designed for cinematic orchestral recording. This method involved placing the musicians around the microphones, capturing a detailed recording of the performance. Due to equipment shortages, and the fact that only three instruments were being recorded, a modified version of the setup was used. Regardless, the setup was successful in capturing a detailed recording of the strings. Using an immersive recording technique to record strings not only helped to add character to the score, but helped to create an immersive listening experience for the audience

Post-Production

The project then continued on to the post-production phase. While many binaural mixes had been developed as a reference for the director, who was still in the process of animating during the production phase, the first concrete mix was completed in early March. This focused mainly on sound effects. Based on research from the literature review, it was clear that the role of the sound effects would be to help subconsciously guide the

[12] Wollage, Nick. "AirCage Array." Echo Project (2025).

audience's attention to objects of importance in the film, as well as helping to build a convincing soundscape. Sound effects were sourced from Soundly and they were mixed alongside the foley, dialogue and score. Still far from the finished product, this mix displayed a more accurate example of what the final product would sound like in an immersive listening environment.

Furthermore, the second mix built on feedback from both the project supervisor and the director. During the second mix, more work was put into the development of the soundscape as a whole. The soundscape was developed with a focus on building up the atmosphere, while adding depth to the existing sound effects and foley. Once the placement of all sound effects and Atmos had been established, the process of balancing the mix began. This involved using automation to adjust the volume of certain aspects of the mix, whether that be individual tracks, or groups of tracks, such as the score or Atmos. This allowed for focus to be pulled to certain aspects, such as the dialogue, music, or certain sounds, as well as helping to build moments of drama. While the first mix represented a coming together of all the individual aspects of the soundscape that had been produced during the production phase, the second mix presented a mix that moved in tandem with the visual storyline.

The final mix was complete in early April. The final mixing session focused on building on the director's notes from the previous mix, as well as some final balancing. This session prioritised ensuring the visual and auditory storylines worked with one another, which involved boosting elements of the soundscape that were important to the narrative. Examples of this involved boosting the dialogue when present, boosting sound effects, such as the polaroid camera and the photos when onscreen, to signify their importance to the plot. Furthermore, this mixing session aimed to develop the dynamics of the atmosphere and score. Although this had been somewhat completed in the previous mixing session, this element in particular needed further work. As mentioned before, this film in particular relies heavily on Atmos, so it was important that the dynamics of the Atmos worked to set the tone of each scene. Automation was used to gradually raise the level of the Atmos track group in certain scenes, to create a sense of overwhelm. Furthermore, the volume was brought down for less emotionally intense scenes. A similar technique was used for the score, with the music rising and falling around the rest of the soundscape, helping to reinforce the tone of each scene. Overall, the third and final mixing session was successful in perfecting all aspects of the soundscape that had been developed over the previous month's work.

Survey

Once all aspects of pre-production, production and post-production were complete, the final objective of the project was to gather audience feedback on the effectiveness of the work. Audience feedback was taken in small groups over the course of a day, with each group watching the animation and filling out a questionnaire, detailing their perception of the film, its soundscape, and how they influenced one another. The questionnaire was developed with the intention of evaluating the audience's immersion in the film. This was done by asking questions which gauged the viewer's attention to details, such as the storyline and setting. Furthermore, the survey then goes on to ask more specific questions regarding the audience's perception of the soundscape. These questions were specifically

tailored to objectively assess whether the audience were immersed in the film, as defined by the literature review.

Analysis

The aim of the survey was to investigate the effectiveness of the film's soundscape. In order to gain new perspectives on the film, participants from variety of different backgrounds were asked to take part. All participants were shown the film before being asked to fill out the questionnaire. Participants in the survey were asked questions regarding their perception of the film through the sound and music. Such questions included whether any aspect of the soundscape stood out to them, if they noticed a relationship between the film's score and the narrative, and if they could describe any aspect of the film's plot. To see a transcript of the survey questions and responses, refer to Appendix B.

To begin, all participants answered the control question adequately. This question asked audience members to briefly describe the plot of the film. The purpose of this was to ensure that each participant had a general understanding of the plot and characters. All participants were able to give detailed information about the storyline and characters, with many responses describing the characters' relationship and its importance to the plot. Based on this information, it was safe to consider all answers as valid feedback.

After answering the control question, participants were asked if any aspect of the soundscape in particular stood out to them. All but one participant said some aspects of the soundscape stood out to them. The Atmos, particularly the sound of a beach environment, which appeared in some scenes, was by far the most popular response. Many respondents commented on the placement of wave sounds in the back speakers, and how they helped to immerse them in the film's setting. Another aspect of the soundscape that stood out to some participants was the sound effects, particularly the sound of the polaroid camera, phone buzzing and the bikes. Participants reported feeling drawn in by these sound effects, establishing their importance in the narrative. One participant also commented on how they felt some of these sound effects would be better suited to the centre of the mix.

Continuing on, participants were asked to identify one to two emotions that aligned with the film's score. This was based on the GEMS 25[13] scale, a comprehensive list of adjectives that effectively convey human emotions. Overall, "sad" and "nostalgic" were the two most commonly identified emotions, with "mellow" following closely. "Moving" and "serene" were also identified by some audience members. These answers align with the themes identified in the control question. Not only do these answers help to identify a pattern of key emotions conveyed by the soundscape, but they also establish a relationship between the soundscape and narrative.

When asked to describe the relationship between the score and the narrative of the film, many participants discussed how the tone of the music reflects the themes and emotions of the film. Many also identified compositional changes in the score, as well as changes in

[13]Lykartsis, Athanasios, Pysiewicz, Andreas, Von Coler, Henrik, Lepa, Steffen. The Emotionalit of Sonic Events: Testing the Geneva Emotional Music Scale (GEMS) for Popular and Electroacoustic Music. Berlin, Germany: Audio Communication Group, Technical University, n.d.

volume as it changes to accommodate the dialogue and Atmos. Some observed tension in the film, relating it to the score, which differs slightly to the responses in the previous question, as none of the participants identified tension or any similar emotions in the score. Aside from this, almost all of the responses further confirmed the findings of the previous questions, helping to strengthen the key themes identified in previous responses.

The final question asks outright whether the participants felt the soundscape had helped in immersing them in the film. All of the participants answered yes, stating different elements of the soundscape helped immerse them in the film. Most frequently, participants stated a combination of music, Atmos and sound effects were most effective in guiding them through the film. Most responses described feeling absorbed in the narrative. The responses to this question confirm the patterns identified in previous answers, while also providing a deeper insight into the audiences' personal opinions on the piece and whether they believed it to be immersive.

Ultimately, the survey results acted as a form of validation of the project outcomes, while also providing a new perspective on the film's score and soundscape, and how they relate to one another. Additionally, the survey helped to gain a deeper insight into the film's soundscape, allowing a clearer understanding of what elements worked, as well as any elements that did not work as intended.

Discussion

Upon analysing the data gathered during the survey, it is clear that some patterns in the participants' answers have been identified. This section aims to dissect these patterns and assess whether they validate the methodology and literature review, or if they uncover a different perspective altogether. The main themes identified in the survey include: commonality in answers regarding the aspects of the soundscape that stood out to the audience, similarities in language used when describing the score, as well as the audiences' perception of their own immersion.

While revising the results of the survey, a pattern of similar words and phrases were identified across the different answers. Many participants used language that mirrored the definitions of immersion discussed in "The Role of Sound in Inducing Storytelling in Immersive Environments"[14]. Participants reported feeling immersed by the soundscape, saying it guided them through the film. Evoking a "vivid feeling of reminiscing"[15] and a sense of "going back in time" with the characters. "The Role of Sound Design in Inducing Storytelling" describes immersion as an "invisible agent"[16] that helps to guide the audience through a visual experience. One could argue that these responses align with this sentiment. Additionally, The journal states that media that is more emotionally provoking causes the audience to experience a heightened sense of immersion. It is evident that the audience experience some amount of emotional investment in the film based on the language used in the responses, this could further signify a sense of immersion. These finding validate the

[14] Salselas, Ines, Penha, Rui. "The Role of Sound n Inducing Storytelling in Immersive Environments." September, 2019.
[15] See Appendix B. for full responses.
[16] Salselas, Ines, Penha, Rui. "Characterising Immersion", "The Role of Sound n Inducing Storytelling in Immersive Environments." September, 2019

methods discussed in the Methodology chapter, particularly in the Post-Production section. During this phase of the project, emphasis was put on building the relationship between the soundscape and the visual story. This included balancing the mix to highlight areas of importance in the soundscape, such as the Atmos and dialogue. In scenes of conflict, dialogue and Atmos were boosted to create a sense of overwhelm. Whereas, in more light-hearted scenes, a more minimalist soundscape was used, with a focus on the score, creating a light yet nostalgic feeling. It is clear based on the findings of the survey that this method was successful in ensuring the audience was emotionally invested, and subsequently immersed in the film.

Furthermore, the most emotionally charged answers were in response to the question asking participants to describe their understanding of the relationship between the score and soundscape. This is most likely due to the previous question, which asked participants to select one to two emotions that best described the score. This question was based on the GEMS 25[17] scale. As referenced in the Literature Review, this framework has been used to assess participant emotions while listening to music. While the results for this were generally successful, the journal did mention that the framework was not always effective in measuring emotion depending on the genre. Despite this, it was decided to use the GEMS 25 scale regardless, as many of the emotions listed fit the themes of the film. This was largely successful, with the audience clearly identifying emotions that correctly aligned with the themes of the film. To add to this, the answers from this helped to inform the answers in the following question, with many participants went on to use the language from the previous question to help convey their answer. This allowed for further expansion into the topic, allowing for a more detailed insight into the participants' perceived emotions and how they were reflected in the score.

Another key theme identified in the responses from the survey is the impact of the Atmos on the audiences' experience. Many audience members remarked how impactful the Atmos, particularly in the beach scenes, was in immersing them in the narrative. The research from Maria Curtis-Sklodowska's "The Role of Sound in the Immersive Experience"[18] backs up the results of this survey. In this journal, the author highlights the importance of direction and specialisation in the soundscape, and how they play an integral part in influencing the audiences' experience. Not only does this verify the survey results, but it also affirms that the objectives set out during the Post-Production section of the Methodology chapter were successful. Careful consideration was put into the specialisation of the Atmos, ensuring it sounded convincing, while also fitting the tone of the scene. The setting plays an important role in the film's narrative, hence the emphasis on ensuring the Atmos was effective in its role.

On another note, some of the ideology in "Sound Design in VR Filmmaking: Opportunities and Challenges in a New Medium"[19] can be related to one survey response in particular.

[17] Lykartsis, Athanasios, Pysiewicz, Andreas, Von Coler, Henrik, Lepa, Steffen. The Emotionalit of Sonic Events: Testing the Geneva Emotional Music Scale (GEMS) for Popular and Electroacoustic Music. Berlin, Germany: Audio Communication Group, Technical University, n.d.
[18] Curtis-Sklodowska, Maria. "The Role of Sound in the Immersive Experienc." AVANT, Vol. XIV, No. 3 (July 2023).
[19] Manolas, Christos, Raptis, Panos. Sound Design in VR Filmmaking: Opportunities and Challenges in a New Medium,. London: Ravensbourne University London, May 2025.

While most responses that commented on the sound effects said they drew them in, one response mentioned something different. The response commented on how the participant felt some of the sound effects would fit better closer to the centre of the soundscape. This aligns with the journals hypothesis that sound effects should be kept within a one hindered and eighty degree view of the viewer. Although it does not directly align with the sentiments of the other responses, it does affirm the validity of the research completed in the literature review. While the intention of the sound effects was to mimic the placement of the objects onscreen, this feedback will be taken into consideration and will be implemented in future projects.

After thematically evaluating the survey results, it is clear that, from the beginning, the audience were immersed in the narrative, the soundscape playing a key role. This can be seen from the first question, which asked participants to explain the plot. The responses gave a clear and accurate summary of the plot, including key details about the storyline and characters. In their answers, participants can be seen pointing out key themes of loss and nostalgia without being asked to do so. This attention to detail shows clear immersion in the film.

The survey validates the objective of this project. The aims of the methodology were successful in guiding the audience through the film. It is evident that the participants answers show a strong sense of immersion in the film, with many of the responses pointing towards the soundscape playing an important role in inducing immersion.

Conclusion

To conclude, this project has evolved significantly from its initial concept. A stronger understanding of immersive media production has been gained through the literature review, with each source providing a different approach to immersive sound design. The Methodology on the other hand, explores how that theory can be put into practice. The Pre-Production section shows the extent of creative direction and planning behind building a soundscape and how it communicates with the visual story. The Production and Post-Production sections see the execution of the planning outlined during pre-production. These sections cover the recording, editing and assembling of the different elements of the soundscape, including dialogue, foley and music. Finally, the Survey section outlines the process of gathering audience feedback in order to test the validity of the work produced. The results are discussed in the Analysis chapter and further expanded upon within the context of the Literature Review and Methodology in the Discussion. The findings of this research show a clear connection between the visuals, sound and music. While the exact process is heavily narrative and genre dependant, this paper successfully shows, through both theoretical research and practical execution, a method for using the different elements of a soundscape as a narrative device, helping to guide the audience through the visual storyline.

Appendix

Appendix A

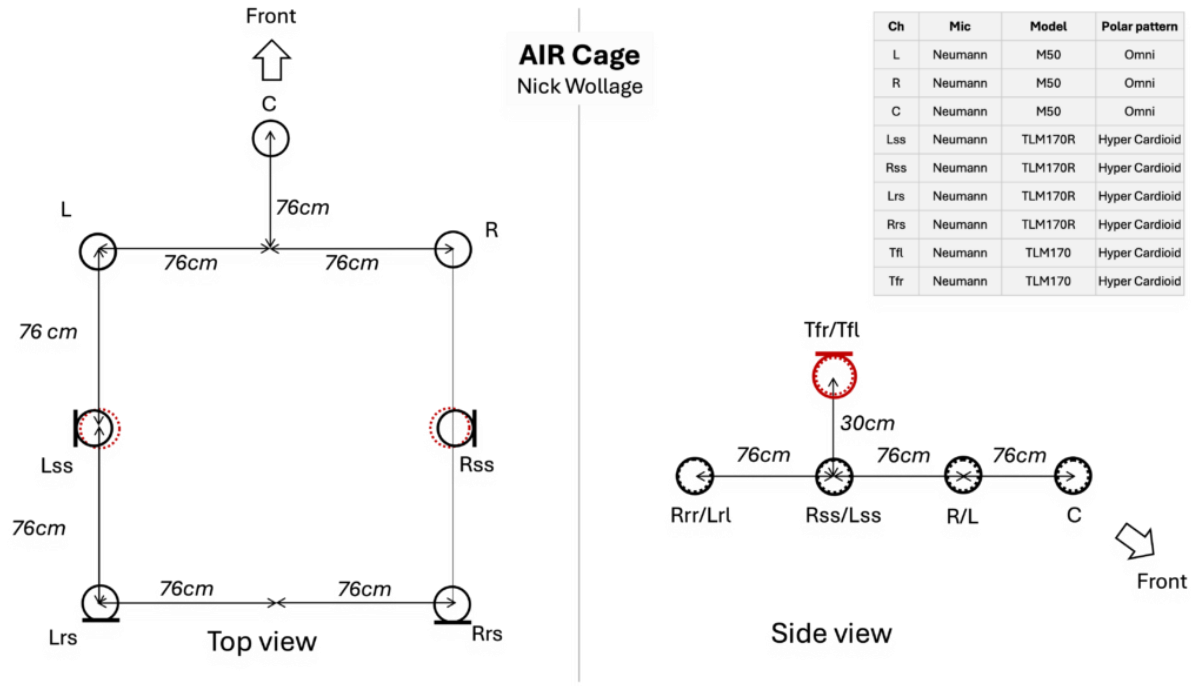

Fig. 1 (APL, ECHO-Microphone Arrays – APL https://apl-hud.com/echo-arrays/,)

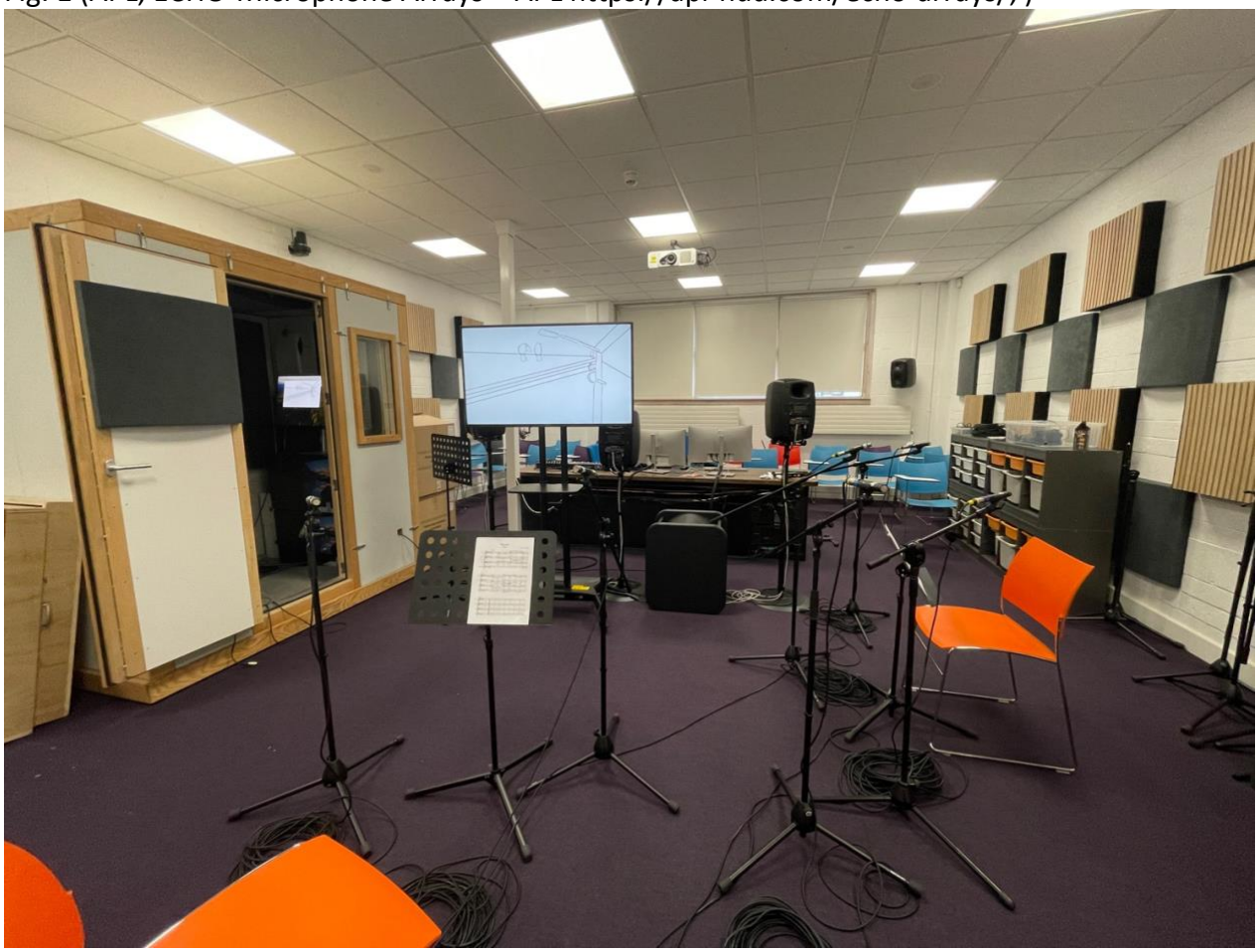

Fig. 2

Appendix B

Could you briefly describe the plot of the film.

11 anonymous The plot is about someone who goes through a moment of reminiscing, losing a connection someone close to them. Whether it was a platonic or romantic connection. It shows flashbacks somebody ruminating on the memories they've made with this person. The little things reminding them of that person. It explores grief and loss and confrontation with that said friend and how life can get in the way of relationships someone who was such a vivid part of your life can turn into a vivid memory.

10 anonymous a friendship/relationship potentially falling apart

9 anonymous It's about a person dealing with the permanent loss of their mother(??) and the temporary disconnection from a spouce.

8 anonymous It's possibly about two childhood/best friends falling out of their relationship with each other. they fell out due to one not being there for the other especially during a rough time, i think when the girl said that her mom died. and it was a sad ending, the two did not stay as friends.

7 anonymous To me it appears to follow a protagonist who is dealing with a great sense of loss and isolation as a result of it. We see them having a good time with someone before cutting back and forth between shots of them alone and seemingly trying to just cope. We later hear a phone call of someone who appears to be the friend at the start and learn that the main character seemed to isolate themselves after something that happened to their mother

6 anonymous Best friends slowly drifting apart due to the impacts of one of the girls mental health quickly declining resulting in poor communication, resentment and confusion regarding their relationship status

5 anonymous Two girls who were once friends lose contact and fall out of their friendship

4 anonymous In the short film, the plot is about a girl who is missing her friend.

3 anonymous a girls friendship falls apart after the death of her mother

2 anonymous There are two young girls who are friends and take a Polaroid photo. I believe one of the girls mum passed away and the other friend didn't know how to talk to her again about it and their friendship drifted. There's an air of resentment but also sadness about a lost friendship

1 anonymous Two friends fall out of touch, it seems one of them outgrew the other but the protagonist still wants to be friends with the other very much so and feels abandoned.

Did any aspects of the film's soundscape stand out to you in particular?

11. anonymous Yes
10 anonymous Yes
9 anonymous Yes
8 anonymous Yes
7 anonymous Yes
6 anonymous Yes
5 anonymous Yes
4 anonymous No
3 anonymous Yes
2 anonymous Yes
1 anonymous Yes

if yes, please describe the aspect of the soundscape that most stood out to you?
11 anonymous The overall use of the waves, reoccurring int he film, it gave a good sense of drifting away from someone.

10 anonymous i liked the camera and bicycle sounds, they helped bring life to the animation

9 anonymous the sound of the waves and just the accompanying background instrumental really stood out to me.

8 anonymous the ambient synth music was really nice.

7 anonymous I found the opening shots very nice in establishing the tone of the piece. There's a very nice balance of all the foley elements and the sea rushing in and out. It feels very immersive and set up for the kind of sad tone of the piece

6 anonymous The background sounds were very immersive. The sound of the phone ringing, bike bell, birds chirping and sea waves crashing against each other.

5 anonymous The ocean sounds paired with the ambient music

3 anonymous the wind

2 anonymous The waves coming in and out really gave a sense of relaxation and it kind of mirrored the breaths of the girl. The phone buzzing on the table felt really real also

1 anonymous I liked the sound of the Sea being in the back of the surround mix, behind the audience, but I think it would sound a bit more natural if it was panned towards the front slightly more.

Could you describe the mood of the music in the film?
11 anonymous ["Nostalgic", "Mellow"]
10 anonymous ["Sad", Moving "]
9 anonymous ["Nostalgic", "Serene"]
8 anonymous ["Sad", Mellow"]

7 anonymous ["Mellow"]
6 anonymous ["Moving ","Serene"]
5 anonymous ["Sad”, Nostalgic"]
4 anonymous ["Sad"]
3 anonymous ["Sad”, Nostalgic"]
2 anonymous ["Nostalgic”, “Moving "]
1 anonymous ["Mellow”, Sad"]

Could you describe the relationship between the music and the narrative of the film in your opinion?
11 anonymous I thought the music really gave a nostalgic but bitter sweet feeling of reminiscing something lost.

10 anonymous in some parts it felt like i was going back in time and looking at the main character's memories. the music set the mood for the narrative

9 anonymous The music sort of guides you to dip into that nostalgic feeling when you reminisce about a loved one you had lost. It really helps out cooperatively with the visuality of the person, who is feeling blue.
8 anonymous the music seemed very mellow, and so was the relationship between the two people. the music was also very calm but that was in contrast with the relationship of the two.

7 anonymous I think the music and the narrative of the film worked nicely. It felt like you could tell where parts were getting more tense, agitated and where things were calming down again. I think it also blended well with the foley where it all felt quite uniform

6 anonymous The music naturally get lower as their relationship begins to breakdown, becoming fragmented by phone notifications and character dialogue interruptions.

5 anonymous I think the music aids the narrative of remembering the past since there were a lot of ambient sounds

4 anonymous The relationship between the music and the narrative is that it is about a memory of a friend and the music fits in with the story.

3 anonymous the music effectively communicates the tone of the movie

2 anonymous The music allows the dialogue and soundscape to take the front seat and is a really lovely subtle accompaniment

1 anonymous The music feels happy and calm in the beginning, when the friendship is strong, but as the friendship deteriorates and slips away the music becomes more mellow and somber, which in my opinion reinforced the narrative we see.

Do you feel as though the sound and music of the film helped immerse you in the narrative?

11	anonymous	Yes
10	anonymous	Yes
9	anonymous	Yes
8	anonymous	Yes
7	anonymous	Yes
6	anonymous	Yes
5	anonymous	Yes
4	anonymous	Yes
3	anonymous	Yes
2	anonymous	Yes
1	anonymous	Yes

If yes, how?

11 anonymousI feel the ongoing use of sounds with barely little moments of silence really reflects the vivid feelings of reminiscing, sometimes reminiscing doesn't feel structured but multiple scenarios playing in your head.

10 anonymous certain things like the bicycle and camera were brought the life- it helped me connect with the characters more- it felt like i was looking into someone's actual story instead of watching an animation?

9 anonymous The music really helped to bring out the nostalgic feeling, but also hinted onto the sadness after losing a loved one.

8 anonymous the dialogue really immersed me into the animation. although the animation was rough, the dialogue stood out as well, since it was the main thing that was guiding the narrative of the animation. and the dialogue was one way of knowing what was happening.

7 anonymous Yes I think they blended together where I was quite absorbed in what was happening in the story. I didn’t notice any elements sticking out to much or taking too much attention away from the narrative which I think is quite ideal for film scores/sound design as you probably wouldn’t want it to be too distracting

6 anonymous It evokes emotion, often reflecting the characters actions and mental state.

5 anonymous I could hear the different ambient sounds all around me, and so I felt as though I was in the setting watching the main character

4 anonymous This helped me immerse into the narrative by thinking about what it feels like when looking back on your memories with your friends

3 anonymous the sound effects i think really added to the hand drawn texture look and communicated a nostalgic and melancholic feel alongside the sad music

2 anonymous The layering of the music and soundscape was so subtle but beautiful and neither stole the spotlight from each other. The two working together really helped to immerse me in the narrative, especially the surround sound element

1 anonymous The music and soundscape immersed me in the narrative I felt, the atmos and Foley felt natural, but there were times when I felt some of the sound effects would be better suited in the centre of the mix or more towards the centre.

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