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Scoring the Experience

A Composer's Perspective on Video Game Music Production

Mats Norrgård

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MASTER'S THESIS

Author: Mats Norrgård
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Supervisor(s): Bob Burke

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Abstract

This thesis on ludomusicology, the study of music for video games, deals with concepts of gameplay music for modern video games from the perspective of a composer. The research based on literature and articles on ludomusicology works as a foundation for a practical project, four gameplay compositions made for a video game, where key concepts are explained and implemented. In illustrating how game music can change according to game states and events, it highlights the importance of dynamic music for enhancing player experience. By examining the practicalities and creative demands on video game composers, it underscores the distinct, adaptive role of music in games compared to linear media like film. This thesis is intended for anyone interested in modern video game music production, with a focus on practical applications of aesthetic, functional and compositional techniques. This practical thesis project has significant practical outputs that should be listened to in conjunction with the written element.

Language: English
Key Words: ludomusicology, video game, music production, immersion, dynamic

EXAMENSARBETE

Författare: Mats Norrgård
Utbildning och ort: Master of Culture and Arts: Creative Music Production, Yrkeshögskolan Novia
Inriktning:
Handledare: Bob Burke

Titel: **Scoring the Experience: A Composer's Perspective on Video Game Music Production**

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Abstrakt

Detta examensarbete inom ludomusikologi, studier av musik för TV-spel, behandlar begrepp kring musik för moderna TV-spel från en kompositörs perspektiv. Forskningen, som baserats på litteratur och artiklar om ludomusikologi, fungerar som grund för ett praktiskt projekt: fyra låtar komponerade för ett TV-spel, där centrala begrepp förklaras och tillämpas. Genom att illustrera hur spelmusik kan förändras av olika speltillstånd och händelser, belyser examensarbetet vikten av dynamisk musik för att förbättra spelarens upplevelse. Genom att undersöka de praktiska och kreativa kraven på TV-spelskompositörer, lyfter examensarbetet fram musikens distinkta, adaptiva roll i spel jämfört med linjära medier som film. Examensarbetet är avsedd för alla som är intresserade av modern musikproduktion för TV-spel, med fokus på praktiska tillämpningar av estetiska, funktionella och kompositionstekniker. Detta praktiska examensarbete har betydande ljudfiler som bör lyssnas på i samband med det skriftliga arbetet.

Språk: Engelska
Nyckelord: ludomusikologi, tv-spel, musikproduktion, inlevelse, dynamisk

OPINNÄYTETYÖ

Tekijä: Mats Norrgård
Koulutus ja paikkakunta: Master of Culture and Arts: Creative Music Production,
Ammattikorkeakoulu Novia
Suuntautumisvaihtoehto:
Ohjaaja(t): Bob Burke

Nimike: **Scoring the Experience: A Composer's Perspective on Video Game Music Production**

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Tiivistelmä

Tämä tutkielma käsittelee ludomusikologiaa, eli videopeleihin sävellettyä musiikkia, ja tarkastelee pelimusiikin käsitteitä säveltäjän näkökulmasta nykyaikaisissa videopeleissä. Ludomusikologiaan perustuva kirjallisuus ja artikkelit toimivat pohjana käytännön projektille, johon sisältyy neljä pelille sävellettyä kappaletta, joissa keskeisiä käsitteitä selitetään ja toteutetaan käytännössä. Havainnollistamalla, miten pelimusiikki voi muuttua pelitilanteiden ja tapahtumien mukaan, työ korostaa dynaamisen musiikin merkitystä pelaajakokemuksen parantamisessa. Tutkielma tarkastelee myös videopeleihin säveltämisen käytännön haasteita ja luovia vaatimuksia ja tuo esiin musiikin erityisen, mukautuvan roolin peleissä verrattuna lineaarisiin medioihin, kuten elokuviin. Tämä tutkielma on suunnattu kaikille, jotka ovat kiinnostuneita nykyaikaisen videopelimusiikin tuottamisesta, erityisesti esteettisten, toiminnallisten ja sävellyksellisten tekniikoiden käytännön soveltamisesta. Tämä käytännön opinnäytetyössä on merkittäviä käytännön tuotoksia, joita kannattaa kuunnella kirjallisen elementin yhteydessä.

Kieli: Englanti
Avainsanat: ludomusikologia, videopeli, musiikin tuotanto, upotus, dynaaminen

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1 Introduction

This is a thesis on *ludomusicology*, the study of music for video games, with a practical project, four dynamic gameplay compositions made for an upcoming video game *Mysspelet*. The research made has been used as a foundation for the practical work. The chapters deal with specific concepts of video game music and their effect on the practical work, the decisions made for the music and its structure is described in text and exemplified in audio files referred to in this text. The four compositions and their variations are distributed into four separate folders, and named to describe their intent for ease of use (see *List of Practical Content*).

1.1 Purpose, objective and methodology

The term *video games* can be quite broad, and is commonly used as an umbrella concept that includes many different types of games for various platforms. In wanting to be more specific one could instead refer to these games as *computer games, arcade games, console games, mobile games* etc. Computer games are played on a computer like a PC or *MAC*, arcade games are played on arcade machines, console games are played on game consoles like *The Playstation 5* or *The Nintendo Switch*, and mobile games are played on mobile phones. Collins (2008, p. 3) refers to the term *video game* as "any game consumed on video screens, whether these are computer monitors, mobile phones, handheld devices, televisions, or coin-operated arcade consoles". The same is done for this Master's thesis, that attends to video game music studies, "the relationship between music and play – a domain of research that is now commonly referred to as "ludomusicology" (Kamp, Summers, Sweeney, 2016, p. 1).

Music in games has been around since *Space Invaders* (1978), but game audio has only been the object of academic studies since the mid-2000s (Summers, 2016, p. 4) and is thus a rather new and partly unexplored field of study. This thesis delves into how music for a modern video game is made. What strategies are there to creating an immersive

soundtrack? What decisions does a composer have to make concerning aesthetics, genre, instrumentation, mood, adaptability, interactability, song length, dynamics, replayability, purpose, technology, tools etc.? Why, what is the reason and how is it done? The findings are explained and implemented in four original music compositions of my own made for an upcoming video game with the working title *Mysspelet* (in Swedish). This thesis references games and their music from over five decades, and is intended for composers, song writers, game developers and anyone else interested in learning about what making music for a modern video game entails, and seeing how these techniques are applied in practice.

This thesis on how to compose a modern video game soundtrack is based on literature, academic papers and articles from journals on the topic of game development and audio for games, as well as my own experience with games and analyses of video game music. The findings of this qualitative research is used in a soundtrack made for a video game, where four of the tracks are treated in this thesis. The decisions made for the sound and structure of each composition are explained and motivated in the following chapters, thus making this research both descriptive and analytical in nature. I start by describing characteristics such as structure, aesthetics, themes and genres of existing video game music, which guided my understanding and the creative process in my compositions for *Mysspelet.* It set the groundwork for my own creative work.

The analyses and findings of this research are made from my own perspective as a researcher and composer, and are therefore inherently subjective. While based on existing literature and video game music, my interpretations are rooted in my unique understanding, experience and taste, and serve as a reflection of my own creativity and are not meant to suggest a definitive approach to composing for video games. While key concepts are explored, my approach represents just one of many possible interpretations of the relationship between music and gameplay.

1.2 Limitations

To home in on a specific area as well as to reduce the scope of the thesis, this research is limited to music only and does not include all audio for games, like the design, purpose and effect of sound FX and other foley. *Mysspelet* is an adventure-style game, so the focus in this thesis is on music for adventure games as well as how to produce a modern soundtrack over a retro sounding one. The difference, based on my research, is however addressed. A video game is generally in need of music for different parts of the game, where the compositions can be quite different from each other since they serve distinct purposes. This thesis will address *gameplay music*, music that sounds during gameplay, which is a key part of the music for most games and something that game music composers will spend a majority of their time on, according to Phillips (2014, p. 151). The practical output for this thesis is thus four original gameplay music compositions. The focal point is not on the recording equipment, recording techniques and plugins used for these compositions, but instead on the aesthetic, functionality and compositional options for gameplay music native of a modern video game.

2 Theories, concepts and key vocabulary

Ludomusicology, meaning the musicological approach to video game music, was coined by the Mark Sweeney, Michiel Kamp and Tim Summers who cofounded *The Ludomusicology Research Group* (ludomusicology.org) in 2011 (Sweeney, 2021, p. 56-57). Joined by other scholars they published the book *Ludomusicology: Approaches to video game music* in 2016, an important collection of doctoral work and other research on the subject. Collins book *Game Sound* (2008) is however considered to be the first academic book written on the topic of audio for video games (Fernández-Cortés, 2021, p. 15). The establishment of *The Society for the Study of Sound and Music in Games* (sssmg.org) in 2016, led to the journal, the *Journal of Sound and Music in Games* (JSMG), with its first published volume in 2020 with the University of California Press (Sweeney, 2021, p. 60), the only journal dedicated to the subject of audio for games. Sweeney (ibid, p. 56) believes a balance between academia and personal observations to be important for the field of ludomusicology.

Video games can be played on various platforms or game systems like a PC or a *Playstation* (Horowitz, 2014, pp. 7-10). Many games today are not exclusive for a single platform, such as games like *Hogwarts Legacy* (2023) which is released for *The Nintendo Switch, The Playstation 4, The Playstation 5, The Xbox Series X, The Xbox Series S, The Xbox One* and *Microsoft Windows*. Games are today commonly referred to as *AAA, AA* or *indie games,* where AAA (Triple A) games are high-budget productions developed by major studios, while independent (indie) games are typically created by smaller teams with lower budgets (Collins, 2008, pp. 89, 108). In the gaming community, the term *retro* refers to older video games, typically from the 1980s-1990s, that evoke nostalgia through classic gameplay, graphics and sound (Moormann, 2013, p. 172). It often includes both original games from those eras and new games designed to imitate that vintage aesthetic, where the new retro-style games usually are created by indie developers since the production cost for those games is lower.

In order to make a modern video game you need a game engine, two of the most popular today being *Unity* and *Unreal Engine*. The games themselves are divided into genres and subgenres, where many games today are a mix of genres (Horowitz, 2014, pp. 53-71, 151, 154). In an action-adventure game, for example, the player is in charge of a player character or *avatar,* where the player can experience the game from different perspectives, through the eyes of the avatar, called *first person view*, or from behind the avatar, called *third person view*. In first person view, commonly only the avatar's hands and a weapon can be seen, whereas in third person view the whole avatar is visible. The gameplay itself generally consists of various game modes, states and events which affect how the game is played. If the audio adapts in any way by these game states or events, the music is called *nonlinear* or *dynamic* (Collins, 2008, p. 139), but if the music is unaffected by any events, the music is *linear* (Phillips, 2014, p. 158). Modern video games generally feature nonlinear music during gameplay and linear music during menus and *cutscenes*, non-interactive, cinematic sequences where the player has no control. Video games are a nonlinear medium, since every playthrough is different (Summers, 2016, p. 161), whereas films are a linear medium that unfolds in the same order every time, unaffected by the viewer.

When composing music for a modern video game, a digital audio workstation (DAW), for example *Ableton, FL Studio, Pro Tools* or *Cubase* is used, commonly together with real or virtual instruments (VSTs). DAWs commonly include plugins able of handling digital signal processing (DSP) like equalizers, compressors, reverb, delay etc., but effects like these can also be applied to the music at a later stage using *middleware*, a type of program able of altering audio in various ways in real time and communicating this (*implementing*) to the game engine, making the music dynamic (Horowitz, 2014, pp. 87-89, 128). Dynamic music is modular, consisting of sections and layers that can be accessed and played in reaction to game states and events. Kamp (2024, p. 4) sees musical cues that change in accordance to game states as "one of the medium's most characteristic features", where the music that reacts to, and fittingly accompanies, the gameplay is made to improve the gaming experience for the player (Collins, 2008, p. 61). How involved or engaged the player feels in a game is an important part of video game and music design, and is commonly referred to as *immersion* (Grau, 2002, p.13). When composing video game music, several factors must be taken into account, where one important aspect is the purpose of the music, which also needs to match and support the aesthetics of the graphics and the overall mood or atmosphere. To achieve this, one has to consider the instrumentation and dynamics of the compostitions. In analyzing game musical immersion, van Elferen (Kamp, Summers, Sweeney, 2016, p. 34) proposes *A-L-I,* an analytical model for musical game involvement, consisting of musical *Affect, Literacy* and *Interaction*. *Affect* can be defined as personal investment, *Literacy*, as ability in communication meaning, and *Interaction* as interaction with the game through music. Kamp (2024, p. 14-15) talks about four ways of hearing or encountering video game music: *background* (music you do not engage with)*, semiotic* (informative)*, ludic* (music you engage with) and *aesthetic* (focus on the music itself). In the analythical, as well as the creative process of the music for *Mysspelet,* both van Elferen and Kamps concepts were used.

As a composer, reference listening to music of other successful games or games of the same genre, as well as playtesting the music to see how players react and interact with the music, can be made to good advantage. Gameplay music is commonly looped, meaning that it is played repeatedly, thus affecting the length of a song and how it is

structured in order to not break the flow of the gameplay as well as avoid sounding repetitive (Phillips, 2014, p. 158-159). Both reference listening and looping concepts had an impact on the structure of the music for *Mysspelet.*

3 *Mysspelet* and the gameplay compositions

The practical output in this Master's thesis is music written for an upcoming adventure style game, or more specifically an open-world survival game in the style of games like *Valheim* (2021), *ARK: Survival Evolved* (2015) and *Minecraft* (2011). Before focusing on the music, let us first attend to the video game project itself *Mysspelet*, a "passion project" for the independent game developers involved, that has been in development for over two years now. For the time being the small team consists of a programmer and two graphic artists, one who does most of the artwork and the other the animations, while there are also a few others helping out sporadically with various tasks from time to time. The game engine used is *Unity,* and the work is *pro bono,* funding for the project will be applied for at a later stage, meaning that the game is still in early to mid stages of development, and a release date still a long way off. The game lacks an official title, the working title being *Mysspelet* (in Swedish) which directly translates to "the cosy game", since the visuals are aimed at being as aesthetically pleasing and cosy as possible. The fantasy world, you as a lumberjack explore, is a set of islands with different environments, like peaceful meadows, majestic taiga forests, arid deserts, dense jungles etc. (see *Figure 1*). While exploring the world, in third person, you fight monsters, build structures, dig tunnel systems, craft tools and weapons, gather resources, plant and harvest crops, all in the name of survival. The game can be played offline or connected to an online server, enabling engagement with other players.

Figure 1. *Mysspelet*: Screenshots of various areas

I got to know the developers through an internship I did in the spring of 2022 when studying for a Bachelor's degree in music production, and jumped onboard this game project in March 2023, where my task is to compose the soundtrack for the game, which might expand to include sound effects at a later stage. Collins explanation of what a composer does:

> "Composers are responsible for the music composition of the game. In smaller companies, they are frequently also responsible for the sound design. They may also be in charge of orchestration of their work, although on larger projects there may be teams of orchestrators working together. They are typically responsible for contracting out and overseeing live recordings" (Collins, 2008, p. 87).

Mainstream video games usually consist of music for intros, cutscenes, menus, loading screens, gameplay etc (Summers, 2016, p. 14). This Master's thesis focuses on the production process of four of the tracks written for *Mysspelet*, of which all are gameplay music. The relevance of this choice and the importance of this type of music is confirmed by Phillips (2014, p. 152) who writes that a composer spends most of his time writing these types of tracks. The four compositions will from now on be referred to as *The Meadow Theme, The Underground Theme, The Desert Theme* and *The Home Theme.* As

the names entail, these are not only gameplay tracks but also associated with specific areas of the game world, and could therefore also be referred to as *area music* (see chapter 5). Games commonly have specific music composed for the different areas of the game world, the purpose according to Phillips (2014, p. 72) being that "themes for locations allow players to differentiate their current locale from the many others that they will experience during the game. Location-specific themes also enable players to develop deeper sentiments about their surroundings", and as seen later in this thesis, this type of music comes with its own set of challenges and problems as the players have certain expectations, and the music many functions and roles to play.

The four themed compositions for this thesis come in several variations since *Mysspelet* has various game states to which the gameplay music adapts. The game states, their accompanying music variations and their purpose is explained using music files, accessible as appendices. The compositions are modular and should not be looked upon and analyzed as finished tracks, since they will not likely be played in the exact same way twice. Medina-Gray (Kamp, Summers, Sweeney, 2016, p. 65) writes the following about nonlinear or modular music: "While musical modularity provides intriguing practical and aesthetic possibilities, it also poses distinct challenges for analysis. How should an analyst approach music whose final content and arrangement is – until the assembly step – unfixed and unknown?". Hart (2014, p. 1) suggests video game music analysis to be based on two things, by looking at the initial composition and the player's experience in interacting with the music.

> "The music's initial composition imbues it with meaning, through both social conventions and its relationship to other elements within the game, but the player's configuration of the game is a significant enough source of musical meaning to warrant a separate semiotic analysis" (Hart, 2014, p. 23).

4 Gaming's evolution: History and technology

Electronic video games have been around since the late 1950s, but rose quickly in popularity with the arcades in the 1970s and finally with the home computers and consoles in the 1980s (Collins, 2008, pp. 8, 20). The development of games has always

been closely connected with the development of technology like the improvement of graphics and sound processors, more internal memory and disk space allowing for larger games. With every new generation of gaming consoles the graphics as well as the audio has taken a step forward. Various technological constraints have until the 2000s in some way restricted how game audio sounds.

4.1 "The Golden Age"

Game audio has evolved quite a lot in a relatively short time, and for the bigger part of the 1970s the games featured only sound effects. The first game with any sound at all was *Pong* (1972) (Horowitz, 2014, p. 23), and the first game to feature not only sound but music, however simple, was *Space Invaders* (1978) (Summers, 2016, p. 4). In the early 1980s the music consisted of simple sounds with limitations to size, length and sounds playing at the same time. Audio was, especially during the 1980s and 1990s, competing with graphics over the amount of dedicated file space on the medium (cassette, disc, cartridge etc.), where graphics were more taxing thus demanding more space. This meant that only some parts of the game were allowed music, like the start and game over screens which usually were accompanied by a short musical jingle during the late 1970s and early 1980s (Collins, 2008, p. 9).

Not only was the music back then competing with the graphics, but also with the sound effects. The game systems of the 1980s, also referred to as the *8-bit era*, like *The C64* (The Commodore 64, 1982), *The NES* (The Nintendo Entertainment System, 1983) and *The Master System* (1985), were limited to playing only a few sounds simultaneously (Collins, 2008, pp. 25, 30). The programmer, who in the early 1980s also was the composer (ibid, p. 35), had to decide how many sound channels he wanted to dedicate to sound and music respectively. On *The C64*, which only had three sound channels, commonly two were dedicated to music and one for sound FX, where another option was to devote all three channels to music and have one channel, usually the lead melody, drop out when a sound effect was played. The sound quality of the initial audio for games was low and the resemblance to any real instruments was crude at best. Collins (2008, p. 9) writes that

"sounds were not an aesthetic decision, but were a direct result of the limited capabilities of the technology of the time". There is still, however, a large retro gaming community dedicated to the old computers and consoles of the 1980s despite their limitation, or maybe because of it. Horowitz (2014, p. 25) claims that "The 1980s were the classic golden age of audio for games. Creative sound design abounded and clever folks had to use all their skill to make some very intricate stuff happen".

4.2 The old versus the new

Retro sounding soundtracks, music for modern games made to sound dated is almost exclusively utilized by small independent game companies today, games like *BIT.TRIP* (2009), *Undertale* (2015), *Axiom Verge* (2015) and *Loop Hero* (2021). This is largely due to their smaller budgets (Kamp, 2024, p. 76). These games also commonly feature the art style and gameplay of games reminiscent of the 1980s and 1990s, also known as the *8-bit* and the *16-bit era*. Two game series that heavily influenced the art style, gameplay and music of the independent game scene are the early *Metroid* (1986) and *Castlevania* (1986) games, to the extent that games similar to these are commonly referred to as *Metroidvanias.* The retro soundtracks of the 2000s feature synthesized sounds, emulating the sound and limitations of old game consoles and computers, and are occasionally even made on the original hardware itself, like Jake Kaufman's (2014) soundtrack for *Shovel Knight* (2014) made on *the Famicom* (in Europe *The NES,* 1983).

Some of these limitations to space allocation for graphics and sound are today mostly encountered within the mobile game industry where the file size of apps still needs considering. Today the music for games is not limited to any amount of channels, size or quality and can consist of orchestras recorded in big studios mixed in stereo or surround sound, that is altered by player actions or specific game conditions (Phillips, 2014, p. 167), like the music for *Journey* (2012), *Assassin's Creed* (2007) and *Super Mario Galaxy* (2007). The most common limitations for audio in games today is budget and time (Collins, 2008, p. 89), where bigger game companies are able to hire a team of composers if needed, as well as a full symphonic orchestra to perform their compositions, and can spend months

on a soundtrack for a *AAA* (Triple-A) game like *God of War 2* (2007). For a small independent developer, on the other end, one person is usually given a few weeks to do all the music and sound effects. The platform is also of importance, where mobile games have a lower budget and shorter development time. The music in games has nonetheless taken on an increasingly important role over time, or as Collins (2008, p. 4) describes it "As sound technology improved through the last three decades, so did its role in games. Music quickly went from being a catchy gimmick designed to sucker quarters from unsuspecting passers-by in arcades, to being an integral part of the gaming experience". New gaming consoles, hardware and software are released constantly which affects and sets new demands on game audio, a music composer for games is thus expected to make good use of this technology (Horowitz, 2014 p. 97).

Mysspelet is not in any way reminiscent of older games, graphically or technically, it is a 3D action adventure game with advanced gameplay featuring exploring, fighting, mining, building, crafting, planting, harvesting etc. It has online capabilities, advanced graphic and light rendering, and game states like day and night cycles which affect the gameplay in various ways. It is therefore stylistically fitting of a more modern and, instrumentally, more realistic sounding soundtrack over a retro sounding one. Sonically, it is consequently a *hybrid* (Zizza, 2024, p. 177), a blend of electronic and acoustic instruments where pianos and guitars are dominant.

5 Game genres and their soundtracks

There are many different game genres, like action, sports, strategy, role-playing, simulation, casual games etc. These can further be divided into subgenres, for example action games can be divided into platform, shoot-em up, and fighting games (Horowitz, 2014, pp. 53-71). Simonson (Simonson *et al*, 2023) argues that "the purpose of video game genre labels is to inform potential users about various features and elements a game has so that they can form an a-priori idea of the experience the game elicits without investing time and money into the game", but that the game label practices today are

ineffective. Cartlidge (2024) agrees in observing that the labels of video game genres today seem to be based on the gameplay experience and game mechanics, which he believes poses a problem for genre classification since "gameplay experience is difficult to specify and gameplay mechanics often overlap between genres". Many games today are a mix of genres where *Mysspelet* could be considered an open-world, action-adventure, sandbox, survival game. It is important for a composer of a game, to early on determine the game genre or genres, since these come with particular expectations. Collins (2008, p. 117) writes that "certain types of games have become associated with specific genres of music". Racing games are associated with up-tempo pop or rock music, while strategy games are normally accompanied by classical style music, partly due to the atmosphere of the games. In a racing game you want the player to feel the sense of speed on the racing track where up-tempo contemporary music would do a good job of elevating that sensation. A strategy game has a completely different atmosphere where the player is in control of multiple units making critical decisions, a bit like chess, hence a more soothing soundtrack is appropriate. Phillips' description of the important role of compositions for adventure, or more specifically, role-playing games, is also the approach that coincides with the function of the music for *Mysspelet*:

> "As a composer for an RPG or an MMORPG, the primary focus should be the enhancement of the world that has been created by the development team. All the components of an RPG are structured to encourage the player to get out into the world and interact with it [...] The music should surround the player with aural details about the intrinsic nature of the setting in which the game takes place. In essence, the music should serve as a world builder, joining forces with all the other elements of game design, visual artistry, and storytelling to complete the sensation of full immersion in the role-playing experience" (Phillips, 2014, p. 103).

The trend according to Armstrong (2021, p. 5) seems to be that the underscoring for Western RPGs is moving towards "shorter atmospheric cues, silence, or more interactive forms of underscoring".

5.1 Aligning aesthetics: How art, gameplay and expectations shape game music

Not only is the genre of importance, but the art style should also be considered before starting composing the music. Fritsch (Kamp, Summers, Sweeney, 2016, p. 33) believes that "the compositional style of game soundtracks is carefully chosen to match plots and graphic designs", while Phillips (2014, p. 46) writes that "our goal as composers will be to create music that matches the emotion of the visual aesthetic, so that the player will be able to perceive the beauty and the detail of the graphics and animations". As stated earlier, *Mysspelet* is a kind of action adventure game where the colorful graphic style is of major importance. The developers of the game want their fantasy world to convey a feeling of beauty and wonder, where the soundtrack and my task as composer was to elevate that emotion. Phillips (2014, p. 129) suggests that the musical style has to be established within the development team. "Whatever our means of interaction, our first objective should always be to make sure that everyone is in agreement about the musical style". The decision was therefore made, in accordance with the team, to compose music that is delicate yet positive. There are however moments in the game when this is altered (see chapter 7.5), but on the whole, the music should give off a sense of calm and tranquility. A good example of this is *The Meadow Theme* (1-The Meadow Theme: Day) where the instrumentation is predominantly piano, but where also synth pads, strings and a lot of reverb is used to give the track a dreamy quality (Collins, 2008, p. 149).

The gameplay of a game is another major factor in deciding the music style. Horowitz (2014, p. 53) talks about how game genres have different gameplay mechanics that composers need to understand in order to create fitting soundtracks. The gameplay in games such as racing and strategy games are very different from each other. In a racing game you take control of a fast-moving vehicle where your reflexes are tested to the limit, while in a strategy game the player can be sat for many hours at a time overviewing, building, organizing and moving troops. The gameplay in *Mysspelet*, and in action-adventure games in general, is a bit more complex and varied, meaning that the music has to adjust to the different game situations the player finds himself in. If the player is casually growing their crops and suddenly finds himself battling a large monster, the music needs to adapt to these very distinct situations.

Since game genres are associated with certain types of music, the players have expectations of what a soundtrack should sound like, and for a game with a fantasy setting, orchestral, medieval or renaissance style music is commonly expected (Moormann, 2013, p. 154), as in for example *Baldur's Gate 3* (2023), *The Witcher 3* (2015), *The Elder Scrolls V: Skyrim* (2011) and *Pentiment* (2022). These guidelines do not have to be followed of course, a composer could consciously violate expectations and score contemporary rock music for a fantasy style game in order to perhaps convey a lighter mood that suits the slapstick tone of the game. How this will be received may be difficult to predict however. Summers (2016, pp. 137-138) writes that "When players have been carefully trained to examine the musical material of a game for its potential meanings and game relevance, it can be surprising when rather unexpected music accompanies the game". Summers continues by giving an example of how he expected *The F.A. Premier League Football Manager 99* (1998) to feature licensed pop songs often found in sports games, but instead got a combination of art music and opera, a soundtrack that was later nominated for a BAFTA award.

In the case of *Mysspelet,* the musical style of the compositions was decided in discussions with the development team as well as based on reference material. Phillips (2014, p. 25) talks about the importance of reference music. "the very important practice of using reference works. [...] The musical style in the reference track has been placed successfully in the visual media work, tested thoroughly in that context, and proven to be effective." For *Mysspelet* referencing was made foremost with music of successful games of similar genres, but also with games of similar setting or mood, games such as *Valheim* (2021), *Astroneer* (2016) and *Minecraft* (2011). *Minecraft* has a lot in common with *Mysspelet,* where the goal of both games is to survive in a 3D environment with various biomes that the player can explore freely. They both also have a day and night cycle with monster activity, resourcing, building and crafting functions. According to Kamp (2024, p. 117), the openness of these types of games is fitting of *aesthetic music*, music that at some points in the game makes the player stop what he is doing and focus on the music itself. This was aspired to in composing tracks such as *The Meadow Theme* (1-The Meadow Theme: Day), discussed further in chapter 5.2.

5.2 Area music: Defining spaces through sound

Most games, regardless of genre, consist of different types of music, music for the intro screen, menus, loading screens, cutscenes, gameplay etc. The practical output for this Master's thesis is music that sounds during gameplay, or more specifically *area music*. Action adventure games are commonly divided into areas that the player explores during gameplay, upon entering an area, the music for that specific area is triggered. Summers describes and talks about the functions of area music:

> "Musical themes for particular areas not only help to characterize places in the game world and help the player to construct their understanding of the virtual geography (i.e. denoting the distinct locations), they also assist in the impression of travel. Musical difference is part of the way that a virtual journey is portrayed; as the landscapes change, so does the music" (Summers, 2016, p. 162).

Mysspelet is divided into different biomes, very distinct from each other, like forests, jungles, deserts, meadows, oceans, mountains as well as underground cave systems. These areas are accompanied by their own non-diegetic music, music that the player hears but which is not played in the fantasy world itself (Horowitz, 2014, p. 76). Four of these compositions are addressed here, *The Meadow Theme, The Underground Theme, The Desert Theme* and *The Home Theme.* The names of the compositions refer to the corresponding areas, but these themes also have different variations that are played during daytime, nighttime, combat etc. The main ideas behind the four themes are explained here, while the variations are discussed further in chapter 7.5.

The Meadow Theme (Track 1 - The Meadow Theme: Day) is played when the player moves through rolling hills and verdant meadows (see *Figure 2*). The music itself consists of acoustic guitar picking, a reverberant piano with light-hearted melodies, dreamy synth pads and soft strings, that was decided would be fitting for the area type and harmonize well with the graphics. It is the first area the player encounters and should give a good descriptive picture of what the player is to expect stylistically.

Figure 2. *Mysspelet*: Screenshots of the meadow area

The Desert Theme (Track 1 - The Desert Theme: Day) accompanies the player in the desert areas of the game where the days are hot, the nights are cold, and sand dunes cover great areas only temporarily interrupted by the occasional oasis and bazaar (see *Figure 3*). The music theme features a basic piano, various hand drums and other percussive instruments, as well as flutes and strings playing melodies in gypsy scale to be reminiscent of the Middle-East, its characteristics and climate. This is musical stereotype, sometimes called a *semantic cliché* (Moormann, 2013, p. 88) and there are countless examples of this in games, similar examples being *The Legend of Zelda: Twilight Princess* (2006) and its *Gerudo Desert Theme* or *Final Fantasy VII* (1997) and the music for the area *Costa del sol* with its "relaxed syncopated Latin Groove (*Ponchando*-like rhythms, similar to those heard in 'Oye Como Va') with acoustic guitars" (Summer, 2016, p. 163). Phillips (2014, p. 131) writes that "All ideas have their origin in the realm of human experience, so if we look hard enough, we'll see parallels between the fantasy world and our own". *Final Fantasy VII* is a Japanese game set in an imaginary world, that feature an area with a Spanish name and music reminiscent of Spanish culture. It is interesting to note that Spanish culture must hence be a part of this made-up fantasy world. Summers (2016, p. 106) argues that music is a part of how players understand a virtual world and how it is constructed. In the example of *The Desert Theme* for *Mysspelet*, someone not familiar with music from the Middle East might not know where the inspiration is drawn from, nonetheless, the players of the game should think of the music as part of the culture of that game area and its people. Summers (2016, p. 62) argues that some musical clichés

can today be seen as culturally problematic and gives an example of an older game, *Street Fighter 2* (1991) describing the music themes for the player characters:

> "the Spanish Bullfighter's theme uses castanet sounds, flamenco rhythms and a melody that evokes the ornamented trumpet of traditional Spanish music, while the Chinese martial artist (Chun-Li) has a wooden-timbred parallel fourth motif in the Orientalist tradition and the Indian character is accompanied by music that imitates bhangra" (Summers 2016, p. 62).

This is an example of musical clichés which have been augmented in more recent releases of the *Street Fighter* game series.

Figure 3. *Mysspelet*: Screenshots of the desert area

The Underground Theme (Track 1 - The Underground Theme) is played in the underground tunnel systems excavated by the player, an area accessible by digging in all of the games biomes. The area itself is quite dark (see *Figure 4*), while the overall tone of the game is playful and positive, so it was decided not make the music for the underground area too dark and foreboding, but give it more of a mysterious character. The music should signal to the player to stay alert, and that this can be a somewhat dangerous place, so the tempo is quite slow, 60 bpm, and the instrumentation sparse with piano and string pads playing minor chords.

Figure 4. *Mysspelet*: Screenshots of the underground area

The Home Theme sounds when the player avatar is at his homebase, improving his house externally and internally, building more structures or tending to his garden (see *Figure 5*). There are two instrumental variations of the theme, if the player is outside roaming around, the chords are played by a piano and the melody by strings (Track 2 - The Home Theme: Piano version (Outside)), whereas if the player is inside a building the chords are played by an acoustic guitar and the melody by a flute (Track 1 - The Home Theme: Guitar version (Inside)). This alteration in instrumentation was made to provide variety to the player (Whitmore, 2004. pp. 387-388) as well as to heighten the sense of safety which is the purpose of the track. The piano and strings, played outside, have more of an "open" character, while the acoustic guitar accompanied by the flute, played inside, feels more homey and intimate. For this track, inspiration was drawn from the film and game composer Gustavo Santolalla and his music for *The Last of Us* (2013).

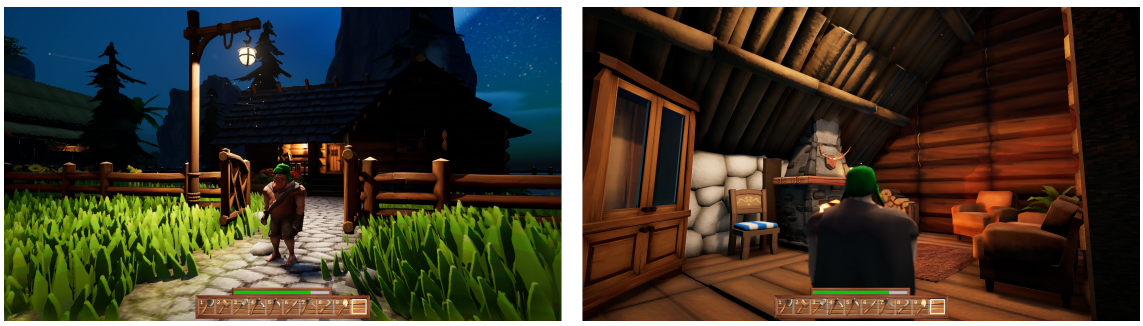

Figure 5. *Mysspelet*: Screenshots of the home area

Phillips (2014, p. 54) argues that "As composers, we should attempt to create music that focuses on the emotions of the characters with which the player should feel the strongest empathy, outlining those situations that evoke the most intense emotions". In *Mysspelet*, the player avatar is a lumberjack in a fantasy world with biomes similar to ours but populated by creatures out of this world. The purpose of the various area music is to interplay with the area type, as well as evoke a certain type of feeling in the player. *The Meadow Theme* (Track 1 - The Meadow Theme: Day) is supposed to convey a feeling of positive exploration, as it is the first game area the player avatar finds himself in, while *The Desert Theme* (Track 1- The Desert Theme: Day) is more mystical. Another example of contrasting emotions is that between *The Home Theme* (Track 1 - The Home Theme: Guitar Version (Inside)) and *The Underground Theme* (Track 1 - The Underground Theme), where the former signals safety and the latter urges the player to be careful. Horowitz (2014, pp. 98-99) points to the importance of music in games by listing six things a good soundtrack can achieve. These can be good to keep in mind when composing fitting music for a game. Here, parallels are drawn to *Mysspelet* and exemplified in its area music as a kind of summary of its intension.

- *Set the tone*, for example a catchy theme song or spooky background music. *Mysspelet* features different bioms where the music is intended to convey the feeling of the different areas. *The Meadow Theme* (Track 1 - The Meadow Theme: Day) carries a sense of light-hearted exploration and *The Underground Theme* (Track 1 - The Underground Theme)*,* mystery and caution.

- *Identify time and place,* for example Nazi Germany or a space colony. Apart from the biomes, the areas in *Mysspelet* are not identifiable with the real world or any historical period, since it is a fantasy setting consisting of a set of oceanic islands with their own rules, flora and fauna. However, when looking at time on a smaller scale, *Mysspelet* contains music written specifically for day and nighttime, with associated ambience like birds (Track 1 - The Meadow Theme: Day) and cicadas (Track 2 - The Meadow Theme: Night) respectively, where the music for nighttime is tranquil with sparser instrumentation compared to that of daytime.

- *Identify location and setting*, for example a street festival or a frozen tundra. The player avatar in *Mysspelet* will find himself in many different locations throughout the game, one being a desert area. The *Desert Theme* (Track 1- The Desert Theme: Day) accompanies the player with instrumentation similar to that of the Middle-East in a desert area consisting of sand dunes, bazaars and oases. Likewise it could be conceivable to compose Nordic folk music for the taiga forest areas and Carribean-style music for the beach fronts.

- *Identify character*, for example a famous spy or a famous plumber. The player avatar in *Mysspelet* is an easily identifiable lumberjack with a flappy hat wielding tools of the trade, thus a music theme could have been made to be associated with this character. Such a conscious decision was not made per se. One could, however, argue that *The Home Theme* (Track 1 - The Home Theme: Guitar Version (Inside)) which is only played when the lumberjack finds himself in the comfort of his own home, is just that. Variations of this theme or its melodies could be used in other parts of the game, focused in the lumberjack, to further strengthen the connection to him.

- *Establish pace of gameplay*, for example a car chase or gardening. The pace in *Mysspelet* changes everytime the player enters and exits combat, where the game pace is increased in combat mode and signalled in the music through the addition of drums and percussion (Track 3 - The Meadow Theme: Night Combat Crossfade (sample)). *The Home Theme* (Track 1 - The Home Theme: Guitar Version (Inside)) is another example of music intended, in this case, to reflect the tranquility of the lumberjack's own cabin.

Increase player's sense of immersion, for example creating emotion. I believe this is not necessarily a separate thing, but more so, a result of achieving some of the things listed above. For example in identifying time, space, location, setting, character etc., an increased sense of player immersion is more likely. However, composing appropriate music to strengthen an emotional part of the game, for example sad music to a sad scene

is perhaps what Horowitz is referring to here. Based on Deenen's six basic audio emotions (Collins, 2008, p. 91), it could be claimed that *The Meadow Theme* (Track 1 - The Meadow Theme: Day) carries a sense of care-free happiness which is consistent with the gameplay in that area.

The four area songs for *Mysspelet,* discussed in this thesis, are altered depending on different game states (see chapter 7.5), as seen with the example of *The Home Theme*. Pianos and guitars were used as the main instrument in all of the tracks to give the soundtrack a coherent feel, even when the style varies a bit between the compositions. Koji Kondo (Moormann, 2013, p. 72), the composer of the classic Mario and Zelda games on the Nintendo, finds it important that all of the music on a soundtrack fit together, to not see them as separate pieces of music. The choice of music for *Mysspelet* was influenced also by my personal background and experience with games and music the last 40 years. Phillips (2014, p. 101) states that "Every game has its own particular mood, and a game's music needs should be evaluated on a case-by-case basis. Likewise, every composer has unique strengths, and those are of paramount importance in considering what musical approach to take". A guitarist will probably feel most comfortable composing on a guitar, while challenges can also be inspiring. If the task is to work within an unfamiliar style, researching games and music of that genre is important, some composers even deem that as one of the most enjoyable parts of writing music. It can be a strength work-wise to manage taking on different genres (Horowitz, 2014, p. 98), especially for a freelance composer, but some rather prefer to delve into one distinct genre and are famous for a specific style of music (Stevens and Raybould, 2011, p. 381), like Austin Wintory, the composer of the Grammy Award nominated music for *Journey* (2012) and *Flow* (2006), or Christopher Larkin, the composer of the music for *Hollow Knight* (2017) and *Tohu* (2021). The former generally writing orchestral music and the latter, piano-based melancholic music.

In organizing and keeping track of the music for a game, *a music cue sheet* can be used, which includes important information about the tracks, their names, function, length as well as other details considered relevant. This is also helpful for the person in charge of

implementing the music into the game (Collins, 2008, p. 91). To follow standardized file conventions an underscore is used instead of a space in the filename, as well as using lower case letters only. The more clear the file name is the better, in the end there is probably going to be hundreds of sounds in total, so adding info into the file name itself is better than naming them *music_01, music_02* etc., as it will make things a lot easier for the person in charge of implementing everything (Horowitz, 2014, p. 84). For *Mysspelet* (see *Figure 6*), "mus" was added in the beginning of the file names, intended for the game, to clarify that they are music files, thus making it easier for the programmer to search for specific file types and separate them from sound effect and other files.

Area cues

File no.	File name	Action	Time	Notes
1	mus_meadow_theme	Looped	5:05	Peaceful
2	mus_desert_theme	Looped	4:02	Middle-eastern
3	mus_underground_theme	Looped	5:04	Mysterious
4	mus_home_theme	Looped	2:57	Safe

Figure 6. *Mysspelet:* Sample music area cue sheet

6 The power of music: Enhancing player engagement

Music plays an important role in video games, and there are ways in which we can interact with audio phenomena in games that is not possible in the real world (Cheng, 2014, p. 5). The purpose of the music can be to enhance the player experience, set the tone, guide and inform the player about his surroundings, the music should therefore not be made too complex or original, but familiar, since the player needs to be able to identify and interpret its meaning (Fernández-Cortés, 2021, p. 21-22). Sinclair (2020, p. 8) argues that all sound in games has three purposes: to inform, to entertain and to immerse. Well-composed music help to create an atmosphere, whether it be epic orchestral music for an adventure game or dark, ambient soundscapes for a horror game.

Music not only supports the narrative and gameplay but can be an integral part of the story itself, making a video game into a profound experience that stays with the player long after the game is over.

6.1 Immersion: A controversial concept in video games

Immersion is a controversial word in ludomusicology and within academia in general. This becomes clear when looking at all the different explanations of the concept (Kamp, 2024, p. 6). Grau (2002, p.13) describes *immersion* as "characterized by diminishing critical distance to what is shown and increasing emotional involvement in what is happening". Salen and Zimmerman (2003, p. 450) with their term *immersive fallacy* argue that immersive quality comes through play and not the game itself, and that the immersion is total, whereas Glassner (2004, pp. 81-82) claims that there are various degrees of immersion. Collins (2013, p. 141), on the other end, talks about two different types of immersion, immersion in the narrative and the experience, which she refers to as *presence* and *engagement* respectively. Phillips (2014, p. 37) again deems that "Immersion takes place when the gamer loses consciousness of the methods of perception and interaction in the game. [...] The gamer has stepped through Alice's looking glass, and is now wandering free through Wonderland". Music can be a big part in achieving that. Collins (2008, pp. 134, 136) agrees with the importance of audio in saying "Audio plays a significant role in the immersive quality of a game". Turning all audio off when playing significantly affects the gameplay, this places certain demands on the compositions, not only what they sound like but how they play. Phillips (ibid, p. 102) believes that "As composers, our job [...] is to support and enhance the realism of the world and the depth of its culture". The music has to be believable, and feel like it belongs in the game world. The music of a game should match its setting. Hart (2014, p. 21) writes that "someone playing *L.A. Noire* (Rockstar Games, 2011), a game set in Los Angeles in the 1940s, will have musical experiences containing a lot of jazz, but not musical experiences containing J-pop". This could be seen as a *semantic cliché* (see chapter 5.1). If the game world is fictional however, it is difficult to talk about realism, one could instead refer to *credibility*. Summers (2016, pp. 86, 104) writes that game music should tell us

about how a virtual game world works and about its construction, and should help in being a world builder, partly by adding credibility.

Some prefer to refer to *immersion* in games as *player engagement* or *player involvement*, meaning how involved a player feels in a gaming experience. Whatever you call it, it is an important concept and a central part of a composer's work (Phillips, 2014, p. 35). This is especially true for video game composers more so than film composers as Collins (2013, p. 22) argues that "The game-playing experience of embodiment is significantly different from that of viewers 'corporeal relationship to film.[...] the stakes for players' involvement, interpretation, and therefore attention are much higher in games, so they listen more actively and employ different modes of listening to guide their own movements and actions in the game". Collins (ibid, p. 148) goes so far as to say that games are so different from films that "we cannot rely on language and theory brought from film studies to account for the ways in which players experience sound in games".

Also the player perspective in a game plays an important role in the experience. Poole (Collins, 2013, p. 53) claims that "third-person perspective is less immersive than first-person perspective since players' point of view is disembodied by their ability to see a character on-screen". Collins does not fully agree with this and argues that:

> "The character, as an extension of the self, becomes as unnoticeable as the controller as players become involved in the game. Whether or not the player character is semitransparent, players may eventually not pay attention to the on-screen character, since the character becomes a tool through which they act, just as they would a controller, and thus the mediated sensation disappears as the character's movements become familiar"(Collins, 2013, p. 53).

Collins continues by saying that regardless of perspective, first or third, the player identifies and empathizes with the avatar since we "convert information about others into an egocentric frame of reference". Verran (2024) describes the avatar as "a shapeshifting, deeply metaphorical entertainment product, one that promises mastery of an ontologically complex virtual object and which can take many forms, from sportscars to gun-toting cowboys, even the wind", and explains the player-avatar relationship as it

taking on a "doppelgängerist appearance, with the player sharing the avatar's headspace or peering over one shoulder". *Mysspelet* is played from a third-person perspective (see *Figure 7*), a perspective common for action roleplaying games (ibid). It could be argued that in seeing the lumberjack avatar with his flappy hat and tools, the player can directly understand what the avatar represents and more easily place himself in that role. Sound is also played from a perspective, the audio perspective is however almost exclusively played from the perspective of the main character, as if the player is in the middle of the virtual world (ibid, p. 56).

Figure 7. *Mysspelet:* Screenshots of third-person perspective

6.2 The art of looping

A common occurrence today that became popular in the 1980s is looping gameplay music (Collins, 2008, p. 19). The reason for it in the first place was due to technical limitations. To save space, short music segments were created to loop during gameplay. The length of the loops is also traditionally related to the genre of the game where genres with the longest gameplay, like role-playing games, have longer loops than for example sports games. This is to avoid something commonly referred to as *repetition fatigue* (Phillips, 2014, p. 66) or *listener fatigue* (Collins, 2008, p. 140), which might occur when a player is exposed to the same piece of music for too long. Since games are a nonlinear medium it can be difficult to estimate how much time a player will spend in a specific area, and thus how to compose the music loop in order for it to not become repetitive. There are a few ways or composition techniques to minimize the risk of this. One already mentioned, is to

create longer loops with several different sections, that will make a track loop less frequently. A simple yet effective, way is to alternate the instrumentation of a song for variation, which can alter it drastically (ibid, p. 67). Another more dramatic solution is to cut out the music entirely after a certain period of time. Fading in and out music must be well balanced with the right timing using slow fades (Collins, 2008, p. 142). In *World of Warcraft* (2004), the music fades in and out at randomized intervals (Kamp, 2004, p. 4), in an attempt to prevent repetition fatigue.

Looping should preferably be done seamlessly in order for the music to not seem having a beginning or end which would interrupt the flow of the gameplay. A looping track should therefore end the same way it begins (Phillips, 2014, p. 168). A technicality that must be taken into account is the reverb which is absent in the beginning of a track and would stand out audibly when looped. To solve this, the reverb tail can be copied to the beginning of the track, alternatively the reverb can be added later in the game engine or by using *middleware* (see chapter 7.2). A rhythmic track with shorter or punchier sounds is generally easier to loop than one with longer reverberated pad-like sounds. It is important to make sure all audio files have *zero crossing points* "the zero decibel point on the horizontal axis" (ibid, p. 176) in the beginning and end, so clicks or pops do not occur when played. This can be done by having super short fade-ins and fade-outs in the beginning and end of a file respectively.

Successful pop songs usually have great hooks that stick in your head. This idea is however a bit problematic when implemented in gameplay music. On the one hand, a catchy melody is something that players will remember and associate with a specific game. Phillips writes the following about the connection between music and nostalgia:

> "The relationship people experience with game music shares common ground with the place that popular music occupies in their lives. Both forms of music serve as the soundtrack to significant personal actions, and hearing the music associated with those actions has the strong potential to bring back vivid memories. Game melodies may in fact function as mnemonic ambassadors for the games from which they come, reminding players vividly of the fun they had while playing" (Phillips, ibid, p. 57).

An instantly recognised and revered song by many gamers is the famous theme song for *Super Mario Bros* (1985). Music like this might however stand out too much and could quickly become annoying. This can, however, be tried and fixed through playtesting. Also the common structure of a pop song, verse, chorus etc. is something that Phillips (ibid, p. 161), for the same reason, considers best avoided altogether: "song structure may be a form best avoided by game composers because it is defined by a sectional approach that emphasizes clearly recognizable patterns of repetition". Therefore, approaching video game music composition in the same way as pop music production, is not recommended. Stevens and Raybould (2011, p. 161) believe that: "if you want to write music for games, you need to learn to write music ... for ... games". A composition without discernable parts would fall into the category of *ambient* or *background music*, music that does not change significantly over time to not attract attention to it. Avoiding repeating patterns and emphasized rhythmic tracks will make the music stand out less. The risk, however, in less melodic music is that it might be perceived as bland or boring (ibid, pp. 67, 159). Thus, a balance should be attained, which might be easier said than done.

6.3 The play function of the area music in *Mysspelet*

The four gameplay tracks for *Mysspelet* are all loopable, and between three and five minutes long. To avoid the music becoming annoying, it stops playing after a while and restarts later, similar to *World of Warcraft* (2004) mentioned earlier. The length of these time intervals will have to be playtested once the game nears completion, but can also be easily changed when the game is already released, in downloadable updates or bug fixes of the game that are common today. The most important thing is that the music is composed in a way that fits the gameplay, so that only minor adjustments are required. The music itself is therefore made up of slow moving textures as well as melodies that are not too prominent in order to not stand out as much. The four tracks consist of several sections, but not in the conventional way of pop music, since they might be looped multiple times depending on the playstyle of the player. Dynamics to the music is added in the game engine, for example in the difference between exploration and combat mode, where the music crossfades between different layers of instruments, to better follow the gameplay and improve the gaming experience. To further vary the music, if

needed, different starting positions of the tracks could be made, so that the music does not always start from the beginning when a player enters another area, or when the music restarts after a period of silence. A game similar to *Mysspelet* is *Minecraft* (2011), which contains a sparse soundtrack, slow fades and 40 seconds to five minute music loops (Kamp, 2024, p. 69). *Minecraft* with its usually quite long gaming sessions, is often devoid of music. Zizza (2024, p. 237) believes that sometimes "less is more", Stevens and Raybould (2011, p. 163) agrees to this and argue that using music sparingly can improve its impact and effectiveness, something that will also have to be tried out in *Mysspelet.*

6.4 Balancing audio: Implementing and mixing

Loopable music fitting of the game genre and setting must also be implemented properly, since poorly implemented music can interrupt the game pacing, hence the transitions between songs should be considered. Transitioning can most easily be done by fading out one and then fading in the other with a brief pause in between. Phillips (2014, p. 53) writes however that "The common wisdom in game audio development includes a belief that it is best to knit together all the music elements of a video game into a seamless experience without noticeable breaks between tracks". In order to crossfade smoothly, the different tracks should have similar tempo and be in the same key. If not, the composer can create transitional sections that better flow into the next track. One example of a game where all the tracks were written in the same tempo and key to facilitate crossfading is *Red Dead Redemption* (2010) (Summers, 2016, p. 39). *The Legend of Zelda: Ocarina of time* (1998) uses both types of segues, but in different situations. When the player avatar changes area, the music quickly fades out and then a new track fades in, but when the avatar becomes engaged in combat, the music crossfades between different layers of music for a smoother transition (Collins, 2008, 146).

A method called a s*tinger* (Collins, 2008, p. 146) or *stab* applied in for example *Grim Fandango* (1998) is the quickest way to transition and entails using a loud sound effect to obscure an otherwise uneven passage, commonly used when combat is engaged. Constant music without breaks might not always be what you want. Silence or the

absence of music can also be effective and give the player breathing room, signal change or emanate a sense of suspense (Phillips, 2014, p. 53) like in *Halo: Combat Evolved* (2001) where the music fades out when the player has not engaged any musical or dramatic triggers for a while, in order for the repeating music to not become irritating (Kamp, Summers, Sweeney, 2016, p. 12). Fading out the music is also a common and effective way to signal to the player to move on to another area, since it creates a sense of nothingness (Phillips, 2014, p. 41). In *Shadow of the colossus* (2005), silence is used to create a sense of solitude (Kamp, 2024, p. 5), horror games, on the other end, like the *Silent Hill* series (1999) use silence for dramatic effect (Summers, 2016, pp.129-130).

As seen earlier, gameplay music can have different purposes and functions, it can be to elevate the atmosphere of a certain graphic style, strengthen credibility to a specific setting, or signal game mode. It can also however be of different significance, depending on the game or game genre the music might be seen as more or less important. In music video game series such as *Guitar Hero* (2005), *Singstar* (2004) and *Rez* (2001), a small but diverse genre, the music is essential (Pichlmair and Kayali, 2007, p. 429). But in puzzle games, like *Tetris* (1984) and *Columns* (1989) for example, the music is mostly present to enhance the enjoyment of the gaming experience, which in and of itself should not be downplayed. The music must not take up too much sound space, so that it clashes with the sound effects which are more important since their task is to quickly signal events to the player (Moormann, 2013, p. 154). Therefore the loudness of the music should be mixed to a level, where a good balance is struck between aestheticism and functionality (Collins, 2008, p. 167). In order for game audio to be effective, it should not necessarily be a representation of reality, but be selective and play subjective sounds that are important for the player and the situation (Stevens and Raybould, 2011, p. 318). Summers (2016, p. 153) finds it important that music in games has a consistent sound level constrained within a limited dynamic range. *Ducking out*, or temporarily lowering the loudness of the music is common when spoken dialogue takes place (ibid, p. 103), in a good sound mix the music is in addition equalized to leave space in the frequency spectrum for the sound effects (Stevens and Raybould, 2011, p. 300). Since the music is there to enhance the gameplay experience, not interfere with it, Phillips (2014, p. 232) believes this to be a reason why surround sound background music is not used very often in video games.

7 Responsive sound: The mechanics of dynamic music

Dynamic music is a powerful tool when composing a modern video game soundtrack, where the music changes in real-time to respond to player actions and game states. As video games continue to push the boundaries of interactive storytelling, the purpose of the music is to enhance the player experience by tying the music directly to the gameplay thus creating a more personal gaming experience. This can be done in several ways discussed in the following chapter.

7.1 Linear and nonlinear music in game design

With *linear music* is meant music "composed with a set musical structure that does not change as the music plays and as time passes [...] a linear piece of game music plays with a planned compositional structure that does not alter" (Phillips, 2014, p. 158). In the 1980s when music starting to be a regular companion in games, this music, often looped, was standard. Today linear music is mostly used for title and loading screens, as well as for cutscenes, but also for arcade style games such as racing and sports games that commonly use licensed music (Collins, 2008, p. 137). Examples of games with licenced music are *Burnout Paradise* (2008) and *Grand Theft Auto V* (2013). These days, most gameplay music is expected to follow dynamic changes in the game, music with these capabilities is referred to as *dynamic* or *nonlinear music*. Phillips (2014, p. 158) describes *nonlinear music* as having "the capability to change based on the state of the game and the choices of the player, creating variations that are determined by the player's actions." According to Collins (2008, pp. 183-187) terminology for gameplay music integration, *adaptive music* is a type of dynamic music that changes in reaction to the game state, whereas *interactive music* changes as a direct response to player actions. An example of adaptive music is the theme for *Super Mario Bros* (1985) where the music speeds up as time is running out on a level in the game. In the snowboarding game *SSX* (2000) the music changes when the player presses the jump button on the controller, and would as such be regarded as *interactive music*. It is important to note though that not all scholars are as narrow in their interpretation of interactive music as Collins is (Summers, 2016, p. 22). Liebe (Moormann, 2013, p. 47) refers to dynamic music, both adaptive and

interactive, as *reactive* music. The terms for non-linear music are thus many and potentially confusing. Medina-Gray raises important aspects of dynamic music or *modularity*:

> "Modularity provides a practical means through which game music can achieve its necessary dynamic quality: the sounding music is able to gain a degree of flexibility suitable to each individualized gameplay situation that would not be possible with more fixed, traditionally linear music. A practical benefit also comes from the economy of building an expansive soundtrack from relatively small repeatable modules" (Kamp, Summers, Sweeney, 2016, p. 64).

In writing linear gameplay music the composer is not able to create a soundtrack that is unique for every game session and dynamically adjusts to the player's gaming experience. As discussed earlier gameplay music is best not written with too much dynamic changes within a song, since it might not fit the gameplay at all times and could, because of its recognizability, become irritating after a while. Dynamics are thus best applied later as in nonlinear music, using for example *middleware*.

7.2 Middleware: Enhancing game music integration

In the 1970s and early 1980s, before the rise of dedicated music software, the games as well as the music were usually programmed in machine code (Collins, 2008, p. 35). Today there are many separate music and game software to choose from, while the game engines themselves allow for audio to be integrated in various ways and to some degree include digital signal processing effects like reverb etc. Most game developers however prefer to use what is called *middleware*, "a type of stand alone software that incorporates itself into a game engine in order to perform a specific task, middleware adds functionality to the primary application. [...] Several middleware applications dedicate their resources to providing tools for the inclusion of interactive audio in a video game" (Phillips, 2014, p. 227). These kinds of programs allow for significantly more integration functions and options than game engines. Game engines and more so *middleware*, allow altering the music by adding real-time digital signal processing (DSP), such as filters or reverb/delay, which puts the music in different spaces sound-wise. This can be effective when the player avatar is located in areas with different acoustics such as caves or

churches, or when you want the audio to sound like it is coming out of a radio or telephone. Middleware functions also include pitch adjustment, 3D positioning, panning, tempo and time signature change, volume change etc., which can all enhance the gaming experience for the player. As seen in chapter 7.5, *Mysspelet* applies some of these functions.

Using middleware, coding is required only to a certain extent which enables the composers to easily implement and test audio functionality themselves. This in turn means more independence for the composer and demands less work from the programmers, but it is not always the composer of the music who implements the music into the game. For the game *Dead Space* 2 (2011), the composer Graves recorded various musical elements that the audio director Don Veca implemented (Kamp, Summers, Sweeney, 2016, p. 188). A game music composer who knows how to use middleware is at an advantage in a very competitive market, and it is today more or less expected from a freelancing composer especially when contracted by smaller game studios. Another benefit of understanding how sound can be handled is that it enables creative ideas and solutions.

FMOD and *Wwise* are two of the most common middleware application softwares today (Summers, 2016, p. 37). However, the first system or engine for dynamic music was the iMUSE system (Phillips, 2014, p. 206), developed by LukasArts Entertainment, and first used in *Monkey Island 2: LeChuck's Revenge* (1991) and later in *The Dig* (1995). When certain conditions in the game were met, the music was altered at various *decision points* in the music. This system, ahead of its time, featured *horizontal re-sequencing, vertical layering*, looping options, panning, detuning, transposing, speed change and other functions (Collins, 2008, p. 52). For *Mysspelet, FMOD* was tested briefly, but it was decided to use the internal sound functions in *Unity* which the developers were already familiar with. The integrated audio system in *Unity* is fortunately one of the most versatile on the market (Zizza, 2024, p. 220), which is something Sinclair also highlights (2020, p. 40). Stems or layers of music were first composed in *Cubase Pro 13* and thereafter exported. The file format of the stems was *.ogg* (Ogg Vorbis), a compressed audio file

format comparable to *.mp3* (Horowitz, 2014, p. 80), but used more frequently in games, and the better option for looping sounds (Zazza, 2024, p. 226). Also by Sinclair (2020, p. 281) is the *.ogg* format recommended over *.mp3*.

7.3 Understanding dynamic music

Arjoranta (2022) describes *hermeneutics* as a "theory of interpretation", and deems interpretation necessary for gameplay. Our interpretations as players are subjective since they are affected by our history. The room for various interpretations is further limited by the gameplay conditions, wrongly interpreting a game enemy as friendly might result in the player avatar's death. Summers (2016, p. 155) argues that "players actively seek to interpret game's musical underscore", gameplay music should therefore help the player in assessing the gameplay situation. There are many in-game situations where music beneficially signals the state of play, for example in exploration, combat, challenges or puzzles that need solving, story or dialogue etc. *Tom Clancy's Splinter Cell* (2002) for example, features dynamic music that changes and escalates for three different game states corresponding to the level of danger the player character is in. The game states are: when the player is undetected, when the enemies are suspicious (near detection), and when the player is engaged in combat (Summers, 2016, p. 122). The music should be kept simple in order to evoke predictable emotions, as overcomplicated music can be hard to read for the player or send out mixed signals. Van Elferen (Kamp, Summers, Sweeney, 2016, p. 35) exemplifies this by writing that "dangerous situations, for instance, have to be immediately identifiable as such, and should therefore be sonically announced by recognizably frightening music". Charles Deenen (Collins, 2008, p. 91) suggests that there are six basic audio emotions: happiness, sadness, surprise, disgust, anger and fear". For a composer to convey a clear emotion with his music, it could be helpful to analyze each situation in these terms and write corresponding music. The music does not always strictly follow the flow of the gameplay, but sometimes also hints at what is coming, intentionally or unintentionally. When a player avatar for example enters a unsafe area unknowingly and the corresponding alarming music is cued, it advises the player to stay alert even if there, at that point, is nothing of danger around. Phillips provides another example:

> "A player may be attempting to stealthily avoid a confrontation with a group of nearby enemies. Suddenly, the enemies spot the intruder, and the musical score kicks into an anxious, high-energy mode. Even if the player hadn't yet noticed the change of circumstances, the music can be relied on to quickly announce that stealth has failed and the time has come to fight" (Phillips, 2014, p. 42).

In *Resident Evil 4* (2005), the music changes when there are enemies around. The same applies to *The Elder Scrolls IV: Oblivion* (2006) (Hart, 2014, p. 30). The player can use this to his advantage, if the *combat music* is still playing when all of the enemies seem to be dead, the player knows that there are still unseen enemies lurking about somewhere and needs to stay on his toes (Summers, 2016, p. 116). The strength of dynamic gameplay music is its ability to reflect the energy level of the gameplay. Phillips (2014, p. 106) argues however that "music can serve the dual function of augmenting that sense of pace, subtly nudging it in the desired direction". An example of this would be in *Super Mario Bros* (1985) where the music speeds up as time is running out on a level. Perhaps the player was not aware of this before the music was cued, but as the music speeds up it stresses the player. Not only is the pace in the gameplay changed, but also the mood of the player. Collins (2008, p. 133) calls this *mood induction*, where the music can control or manipulate the player's emotions, an example of this would be when the player avatar is in great danger with fast paced music playing when fighting a big monster. *Mood induction* should be done with care however. Phillips (ibid, p. 41) says that "It is always a good idea to avoid enhancing the frustration or anxiety level of the player. [...] we should carefully assess the energy level of our music". This is another example where playtesting is recommended in order to assess other players' experience with the music.

7.4 Concepts of dynamic music

Horizontal re-sequencing and *vertical layering* (Phillips, 2014, p.188, 193) are two important concepts in dynamic music. The terms themselves are however potentially confusing as some people reverse them, and can instead be referred to as *branching* and *layering* (Moormann, 2013, pp. 64,65) which is the case in this thesis. It is not uncommon for game music today to both consist of *branching* and *layering* functions, as in *God of War* (2005), since they both have advantages and are suited for different situations. It is

up to the composer to decide what he thinks works best from situation to situation, but is most common in music during gameplay.

With the term *branching*, is meant a function for music consisting of several sections, where the music, at various markers, can jump to a specific section in reaction to a game state change or player action. These sections can be long or short depending on their intended function. Short sections are usually transitional sections created for a smoother transition from one section to another (Stevens and Raybould, 2011, p. 200). This means that you can have gameplay music going from *section A* to *section B*, via a short *section X*, where *section A* can be looping music played for exploring and *section B* is looping music played during combat (see *Figure 8*). If, let's say the tempo, key or loudness is significantly different between these sections, a *section X* might be needed in between. In testing the loudness in several modern games from various developers, Wang (2023, p. 11) found that the music played during combat is noticeably louder than the music played when exploring, about ± 5 LUFS (Loudness units full scale). Advanced game music can consist of many different sections and transitional parts, as in the game *No One Lives Forever* (2000) which consists of thirty transitions, some via short transitional sections and others directly. In the game *The Legend of Zelda: Ocarina of Time* (1998), the music for the game area *The Hyrule Field* consists of several musical sections played in random order to maintain interest and diversity (Collins, 2008, pp. 158, 163).

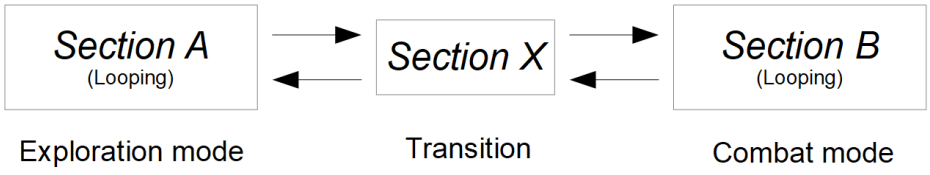

Figure 8. Basic example of *branching*

Layering, on the other hand, refers to a function where the music, made up of several layers, commonly instrumental, add and remove these layers, usually via fade-ins and fade-outs, depending on the game state. This can smoothly and easily change the

dynamics of the music to suit different game events. You could for example have three instrumental layers playing and looping during exploration mode and then add a fourth percussion layer when combat commences to add tension (see Figure 9). The Legend of Zelda: Ocarina of Time (1998) uses this method since it is a fast way of transitioning into combat. You can seamlessly fade in and out other layers at any point, unlike branching. Layering can also be used to indicate a location, as in Super Mario 64 (1996) where strings are added when underwater.

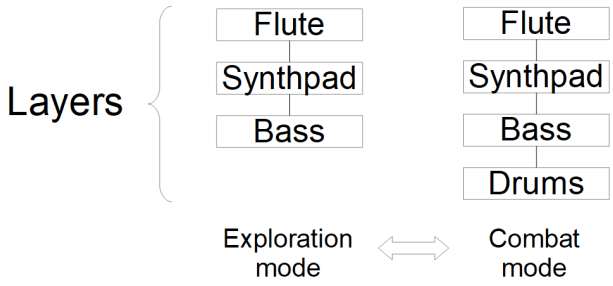

Figure 9. Basic example of *layering*

There are different approaches to *layering,* the layers can be made up of instruments or groups of instruments, hence one layer can consist of a piano or pianos and organs, and another of guitars. You could also think of it in terms of the frequency spectrum where some layers add bass content and others add top-end. Yet another way to look at it would be to have layers dedicated to rhythm, pads, chords and melodies respectively. The important thing is how the different layers sound together, adding and removing layers should influence the sound enough to make a difference, without it sounding too weak or too messy. Phillips uses the term *tone color* when referring to how to best structure a composition:

> "Let's define tone color as the intrinsic quality of a sound that differentiates it from the other sounds around it. [...] The tone colors of various instruments determine their *place* in the overall ensemble. The pieces of the puzzle fit together because the prudent composer has arranged the instruments so that each tone color has its designated place in the structure of the composition" (Phillips, 2014, p. 24).

7.5 The role of dynamic music in *Mysspelet*

The gameplay for *Mysspelet* features dynamic, or adaptive music, specifically *layering*, where instrumental layers fade in and out depending on the game mode. The following quote from Collins matches with how the gameplay music is layered in *Mysspelet*:

> "It is possible to hide elements in the mix (mute them completely), and just bring them into the mix at important times, in layers. The music is composed in instrument layers with the understanding that at any time various instruments may be dropped from the mix and others may be added" (Collins, 2008, p. 152).

Game modes can be divided into *game states* and *game events* (ibid, p. 99). Game states in *Mysspelet* are for example *day* and *night*, and a game event is *combat*. There are many game modes in the game where several of them are indicated with a variation in the music, the ones addressed here are referred to as *Day, Night* and *Combat,* where *Day* and *Night* are exploration variations (see *Figure 10*). *Mysspelet* features a day and night cycle which affects the game in various ways, so it is important that the player is alerted, along with the graphics, when entering and moving within a certain time of day (see *Figure 11*). During exploration mode for the meadow, underground and desert areas, the corresponding area music and associated ambience layer is played. *The Home Theme* is different since it has no combat variation, instead it has *inside* and *outside* variations playing when the player avatar is either inside one of his buildings our right outside exploring the vicinity (Track 3 - The Home Theme: Crossfade (sample)).

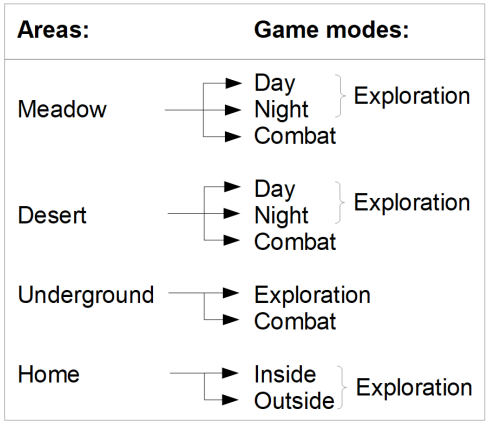

Figure 10. *Mysspelet:* Game modes of the areas

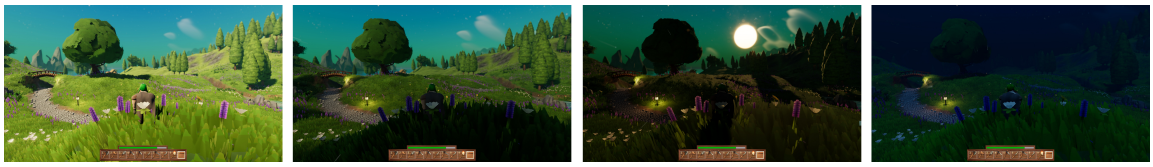

Figure 11. *Mysspelet:* Screenshots of a time lapse

When the player becomes engaged in combat the music crossfades into *Combat* mode (see *Figure 12*) by adding a layer of percussion (Collins, 2008, p. 152), brass and strings, and removing the synth pads, melodies and ambience layers (see *Figure 13*). The combat music is more dramatic, rhythmic and less melodic than the exploration variations, in order to add tension, focusing the player solely on the combat and not the melodies or the surrounding ambience (Track 4 - The Meadow Theme: Day Combat Crossfade (sample)). The music for the exploration modes could be seen as *background music*, since it is not informative other than it matches the situation or area the player is in (Kamp, 2024, p. 177). According to Kamp, *background music* can become *aesthetic,* in focus, momentarily, for example in a cinematic scene of natural beauty, together with the graphics creating an aesthetic experience. In games, the player is not attentively listening all the time: "The aesthetic moments in video games arise out of background hearing" (ibid, p. 75). The combat music, on the other hand, is informative about the gameplay in announcing enemy presence, and is therefore *semiotic* (ibid, p. 143). Kamp (ibid, p. 150-151) sees *semiotic music* as having two characteristics: it needs to sound different from its context, how is unimportant, and secondly, it only requires a short moment of attention: "our semiotic attention to the music ends as soon as we have deciphered what the music is telling us".

The *Night* mode is a softer more quiet version of *Day,* where the instrumentation is different to fit that of *Night*. The melody in *The Meadow Theme* for example is in *Day* mode played by a piano (Track 1 - The Meadow Theme: Day) and in *Night* mode by a flute (Track 2 - The Meadow Theme: Night). The *Day* and *Night* variations differ in instrumentation, but also play variations of the same melodies, thus being themes or *Leitmotifs*.

Figure 12. *Mysspelet:* Screenshots of combat

Area	Mode	Instrumentation
Meadow	Day (exploration)	Piano, synth pads, strings, acoustic guitar
Meadow	Night (exploration)	Synth pads, strings, flute, accordion, metallic synth sounds
Meadow	Combat	Percussion, brass, strings
Desert	Day (exploration)	Piano, flute, strings
Desert	Night (exploration)	Synth pads, strings, flute, accordion, metallic synth sounds
Desert	Combat	Percussion, brass, strings, synth pads
Underground	Exploration	Piano, synth pads, strings
Underground	Combat	Percussion, brass, strings, synth pads
Home	Inside (exploration)	Acoustic guitar, flute, synth pads
Home	Outside (exploration)	Piano, strings, synth pads

Figure 13. The instrumentation of the themes for *Mysspelet*

Phillips' (2014, p. 58) explanation of the word *Leitmotif:* "The Leitmotif [...] is a musical theme that accompanies a specific element in the dramatic work in which it appears. This may be a character, a location or a unique situation in the plot". As explained earlier, the themes for *Mysspelet* are used for describing the various areas or locations of the game. Phillips (ibid, p. 57-58,) considers leitmotifs to mostly be associated with operas and movies like *Star Wars*, but are actually: "very well suited to the video game format". Phillips (ibid, p. 60) on important functions of leitmotifs: "When used appropriately, the

leitmotif can demonstrate a clear representation of a person, event or object providing additional auditory messages to the viewer. [...] Using leitmotifs, music can deliver a wealth of subtext that is otherwise difficult to convey". The themes in *Mysspelet* help the player associate the music with a specific area, while the variations of the themes give the player further information about the game mode and mood. There are several other ways in which the leitmotifs or themes could be used in *Mysspelet, The Home Theme,* for example, could potentially be used in other areas or locations of the game that you want the player to experience as safe, or even want to be associated with the player avatar himself.

The Menu/Pause mode is another game mode in *Mysspelet* that affects the music, and is activated when the player accesses the menu system during gameplay (see *Figure 14)*. In offline mode this also pauses the game, which is not possible in online mode since the player is engaged with other players. The music is in this mode bandpass filtered using an equalizer to remove top and bottom end in the frequency spectrum. This puts the music in the background by making it sound as if being played by very small speakers, on a small radio or telephone, the loudness is simultaneously lowered to convey a sense of calm, but also signals to the player that the game is still running (Track 8 - The Meadow Theme: Day Pause Filter (sample)). Collins (2008, p. 149) argues a drop in volume to be quite common in video games, especially on menu screens. In order to not annoy the player with endless looping music, as discussed in chapter 6.2, the gameplay music in *Mysspelet* stops playing after a while, and starts again when the player avatar moves into another area or enters another game mode like *Day, Night* or *Combat*. When there is no music playing, the ambience and other sound effects can still be heard. There is an associated ambience layer playing for every area, that temporarily fades out when the combat music fades in. This ambience continues to play, however, when the music, at times, fades out. It is a stereo layer, separate from other local and directional sound effects, that is made to fit that specific area, laying a foundation of its surroundings. It consists of subtle sounds of wind, leaves, water, animals etc. (Track 7 - The Meadow Theme: Night (No Music)). This type of stereo layer, that does not pan around following the player's moves is commonly used in games (Stevens and Raybould, 2016, p. 26), along with other ambient sounds that can be located.

Figure 14. *Mysspelet:* Screenshot of the in-game menu

8 Behind the score: Composing for video games

Music in movies, particularly Hollywood films, has had a big impact on game music (Summers, 2016, p. 176). Sanger (ibid, p. 143-144) deems this as negative since games are then only seen as an imitation, instead of playing to the strengths of the video game form. In comparing games to film, there are similarities, but also differences. Films have a set final version that remains the same every time you watch it, whereas games change for every playthrough (Collins, 2008, p. 89). Music in games commonly has greater priority, probably due to the interactive aspect of games where the players constantly have to make quick decisions that affect how the game progresses (Summers, 2016, pp. 164, 176). As we have seen this affects the way the music is composed.

When looking into a career as a composer in the game industry, an understanding and passion for games is an asset, since making games can be very demanding with long working hours, especially in the end of a game's development when a release deadline has to be met. This period is commonly referred to as "crunch time" (Phillips, 2014, p. 8). Luckily, more and more game companies now openly declare that crunching is not part of their work policy. Apart from the larger game studios, very few game companies have their own music or audio department which means that they hire outside help when needed, often quite late in the development process (Phillips, 2014, p. 78). This means

that most game music composers work as freelancers and get involved when most of the game is already completed, unless the music plays a major factor in how the game works, for example in rhythm games like *Parappa the Rapper* (1996) (Kamp, Summers, Sweeney, 2016, p. 156).

According to Strötgen (Moormann, 2013, p. 195), the average total time of a game's soundtrack is 30 minutes, consisting of 10 to 15 pieces of music. This varies, however, depending on the genre of the game where large rpg-style games may contain considerably more. Composer Michael Pummell claims to produce a piece of music every day, the production rate however, is dependent on what type of music is made, where nonlinear music is much more demanding and time consuming than linear. The length of a track and the instrumentation, plugins versus live orchestral recordings also affect the time required.

8.1 The composing process of *Mysspelet*

When I joined the development of *Mysspelet*, the game had been in production for about six months. There was an early version of the game where you could control the player avatar and move around in a couple of different biomes, but not many other functions had yet been added. Since the game is being developed for PC, I was able to install a working, playable prototype of the game, a so-called *game build* on my personal computer. This prototype was updated regularly in step with each progress that was made in the development of the game.

Going through the game and taking notes on what music is needed where, is referred to as *spotting* (Collins, 2008, p. 90). This is usually done quit late in a game's development. It is good however to have an idea of where music is needed in a game as early as possible, a so called *music asset list.* "A music asset list is an educated estimate of the game's musical requirements, broken down into tracks with information about length, musical style, and placement within the game"(Phillips, 2014, p. 124). Since such a list had not

been made for *Mysspelet,* it was decided, in discussion with the team, to start composing area music for the area types already created which helped in getting a sense of what the music should sound like. Collins (2008, p. 85) writes that "Audio production is not merely a series of compromises dictated by technological and industrial constraints. It is also a series of compromises with a team of people who work collaboratively, which has important implications for its production". A couple of songs for *Mysspelet* were composed and rejected before a style was found that the team unanimously felt was appropriate for the game, its gameplay and graphic style. The rejected compositions were seen as too protrusive, rhythmic, retro sounding, or too somber and not synonym with the overall lighter tone of the game and its graphic style. The first track to get approved was *The Meadow Theme* (Track 1 - The Meadow Theme: Day).

As the development of the game progressed, so did the functions in the game. These, in turn, led to ideas and discussions on how the music could adapt to the various game states. A day and night cycle was quite early introduced, where it was clear from the start that we wanted these to be accompanied by suitable music, in order to enhance the mood of each time period but also signal a difference, since there are variations in events between the two (Track 1 - The Desert Theme: Day, Track 2 - The Desert Theme: Night), during nighttime, for example, monsters are more active. Later, it was also decided that there would be a variation of the music for combat (Track 3 - The Underground Theme: Crossfade (sample)). The development team was very open to ideas, as well as keen on sharing their own. As stated earlier, this game is a "passion project", meaning that they work on a game they really believe in and enjoy making, which is a huge advantage. Phillips (2014, p. 114) argues that "Enthusiasm is our best creative tool. It fires our imagination, gives us energy, supplies us with ideas, and eases the difficulties of problem solving". Phillips (ibid, p. 135) continues "As game composers, our creative output has a strong influence on the rest of the team, whether we know it or not". When first seeing *Mysspelet* I was inspired by its graphic style to write beautiful compositions, later when I showcased some of my written music to the development team, they, in turn, were inspired to add new objects and functions to the game.

Most of the compositions in *Mysspelet* were made using VSTs inside a DAW (*Cubase Pro 13*), which facilitates synchronization of different tracks or layers in a composition. This is important when making dynamic music using *layering.* The acoustic guitar on *The Home Theme* (Track 1 - The Home Theme: Guitar Version (Inside)) is however an audio recording, and as such, the guitar had to be played *tightly* to a metronome so that it is interchangeable with the piano part in order for a smooth crossfade between the two. The designers for *Super Mario Galaxy* (2007) were at first hesitant to acoustic recordings for this very reason, "out of fear that such a score would be less easily programmed for close correspondence with the game's action" (Summers, 2016, p. 194). Zizza believes that, in an electronic production, the addition of a single realistic instrument can make it come alive (2024, p. 177). Music recorded for dynamic situations have to be played less "humanly" than you might usually do, for synchronization purposes. The piano part of *The Underground Theme,* for example, was first played with small changes in tempo at the end of certain sections for a more emotional and human feel of the piano play. This was however later removed when combat mode was introduced in order to sync the percussion to the piano (Track 3 - The Underground Theme: Crossfade (sample)).

8.2 The road ahead: Future developments for *Mysspelet*

Riviere (2024, p. 32) gives an example of different stages a game in development can go through: "first playable version, vertical slice, Alpha, Beta, early access, gold etc.", where *gold* means that the game is ready to be launched. *Mysspelet* is, in the time of writing, not finished and would fall somewhere between a first playable version and working towards a vertical slice. A lot of graphic assets are created, but the game is still missing many gameplay features. There is also more music to compose. Several biomes created graphically are still missing dynamic music. Stevens and Raybould (2011, p. 168) consider testing and iteration to be vital in both game design and music, so it was decided, also by the development team of *Mysspelet,* to test the music already created for the different game modes before writing the music for the rest of the areas, in case major changes need to be made. Concerning mixing, Riviere (2024, p. 66) talks about splitting your in-game music into two stems, a critical and a non-critical. The critical stem consists of important elements like melodies or percussion, while the non-critical stem consists of

drones and pads etc. This way, if needed to, you can lower the loudness of the non-critical stem to make room for other more important sounds, in case you feel the mix is too crowded at some point, without the effect being too noticeable on the music, or worse, having to cut out the music entirely. Splitting the four area tracks of *Mysspelet* into two separate stems is done quite easily and might be tested if deemed necessary, for example if dialogues, that need to be highlighted, are introduced. Mixing is however something that is done in the final stages of game development.

The title screen and cutscenes, added at a later stage, will also need music, however linear. Our interim goal now is to complete a *vertical slice,* described by Phillips (2014, p. 146) as "a game level or area that has been completed in its entirety, including all programming, design, art, sound, and music elements". This is commonly used to demo the game to publishers for funding or to the studio in order to get a "green light" for continued work on the project.

9 Conclusion: Evaluating project outcome

Composing music for video games can be quite intricate. Creating a soundtrack for a game involves more than just composing, apart from composing there is also production, editing and implementation (Moormann, 2013, p. 70), all of which, particularly in smaller productions, often fall on a single person. This requires certain skills that are not needed when writing music for TV, film or any other part of the music industry. The tracks are often written as loops, and as such they have to meet certain criteria to be functional. Fluidity and adaptation are two important factors that a music composer for video games today has to consider, the different parts of a track have to flow well into each other and not be too prominent in order to not become irritating, while the end of a track has to flow well into the beginning in order to loop correctly. The different tracks also have to work well together in order to create a seamless experience for the player, here the timing, as well as a uniform soundtrack, is important. Apart from the structure, the compositions have to adapt to certain game modes that are set up for the game, common

ones being exploration, stealth, combat, puzzle sequences etc. In addition to the technical aspects, the music has to be strong and memorable, and enhance the player experience in harmony with the graphics. "An excellent audiovisual match, [...] could draw the eyes of the player to the outstanding beauty and power of the art design, bolstering the perception of the visuals as a strong contribution to the overall experience" (Phillips, 2014, pp. 45-46).

For the four area tracks of *Mysspelet,* a lot of time was spent on trying to meet the above-mentioned criteria. The compositions consist of several parts, but not the conventional *verse, pre-chorus, chorus* etc. To avoid recognizable dynamic changes in the compositions that would not necessarily follow the gameplay, the tracks were layered, so that the changes in dynamics could be altered by the game states and events. Discussions were made on which game modes are most important for the game, and that those should be signified with changes in music. We arrives to the conclusion that those are *exploration, combat, day* and *night*. The music for the exploration mode is melodic, while the music for combat is rhythmic and more or less devoid of melodies, this is to give the exploration mode a feeling of adventure, and the combat mode a sense of action. The difference between the two modes is audible and fitting for their purpose, but they also blend well since they were composed to fit on top of each other. The idea of *contrast* was also used in the music for day and night mode, where the day theme is louder and more dense, and the night theme, softer and more sparse in its instrumentation, here woodwinds, bell sounds and accordions were used instead of grand pianos. Together with the associated ambience, I think the day and night themes help in creating an appropriate mood and background for the various areas.

If a lot of thought was put into the structure of the compositions, even more effort was made into getting the style right. The working title of the game is *Mysspelet* (in English: *The cosy game*)*,* indicating that the atmosphere of this game is of major importance. In meetings with the developers, almost every decision made was questioned through the lens of: "Is this adding anything to the cosiness of the game?!". Several music compositions were scrapped before a style was found that the developers found fitting.

The tempo of these approved tracks is quite slow, with a dreamy character because of the pad sounds and long reverbs used. The piano was chosen as the base instrument because of the cinematic feel you can get from that instrument, which was deemed fitting for the graphic style and gameplay. *Mysspelet* is the type of game where you can have quite long gaming sessions, meaning that the music needs to be quite mellow in order not to become irritating. The piano together with strings, acoustic guitar, flutes and electronic elements are the main instruments of the compositions. The rhythmic elements consist of hand drums and percussion rather than a drum kit, both were tested but the former was found to fit better with the rest of the music.

The home area in *Mysspelet* is where the player avatar begins his adventure, and as such, this place is supposed to represent safety and comfort. In trying to achieve that feeling through the music, a transverse flute is accompanied by an acoustic guitar. The idea of changing the instrumentation between the indoor and outdoor environment, to a more open sound with piano and strings for the outdoor area is made to convey a sense of openness. The music played in the underground is more dark and mysterious than the music for the meadow area which is more light and adventurous, while the desert theme is thought to be a reflection of the people in that area, and their culture. To summarise, the area music and its variations tries to catch the mood of that specific place and time, as well as inform the player of what type of area it is and how to proceed. It is also made unique enough to be recognized by the player upon entering another area of the same type at a later stage in the game.

As a composer you should not be afraid to explore your freedom as an artist. However, in the research made for this thesis there seems to be a common view of which concepts to include in a modern video game soundtrack and how to do it, in order to best create an immersive soundtrack for the player. This is based on experience, tried and tested methods, and seeing what has been done in other successful games (Phillips, 2014, p. 25). Because of me not having extensive practical and professional experience in writing music for video games, I decided to follow the guidelines set up by more experienced people in the field, as well as play to my personal strengths as a composer. I believe those to be

diversity, knowledge of different genres and instruments, melody lines and rhythms. For *Mysspelet,* no experimentative, rebellious or controversial decisions were thus made for the music composed. The research, apart from guiding me, also inspired me and gave me creative ideas for these compositions as well as for the music not yet written. The compositions presented in this thesis might not be the final edits depending on how the game development progresses, what features are added, and what the developers decide. This is commissioned work, meaning that the most important thing is that the developers are satisfied, in this case however, the developers are open to ideas and easy to work with. My goals are fully aligned with those of the developers, working together to create a soundtrack that elevates and complements their vision for the game.

How efficient the music is, and how it is received by other players, is known only once playtesting starts. However, me having done the research and followed recommendations made by professionals, through reference listening to other similar and successful games, as well as positive feedback from the development team, could be seen as a first indication that the music already composed for *Mysspelet* is suitable. Other composers might have made different choices, depending on their background, strengths and experience, but trying to predict and comply to the expectations of the players is probably a good start. Everyone experiences the same piece of music differently however, or as Kamp (2024, pp. 173-174) puts it "the way in which we hear music in games depend on our individual relationship to them: our experience with games, our level of musicianship, our moods, our place in the world".

10 Discussion and future directions of ludomusicology

As seen earlier in this text, video game music has always been linked to and developed in step with technology. Game music was for a long time limited to a set number of tracks or channels, disk space, sound format or storage medium. Today, the sky is the limit. Music for triple-a games is written by several composers, recorded by big orchestras and choirs, while the final audio is mixed in surround sound. Dynamic music is standard for gameplay

music these days, some games with more intricate systems than others, steadily becoming more and more complex. My belief is that this will continue, but develop even further, to become more interactive and adaptive in order to keep up with film scores, that perfectly follow each frame of the film thanks to its linearity. With each generation of video game consoles, technology has taken a leap forward, video games have always been in pursuit of some kind of realism graphically and sonically, which is interesting considering that they are, in themselves, an escape from reality. Dynamic music will likely also spread to other media such as music albums and interactive books, as there are already interactive movies where the viewer can change what music is played, such as Netflix's *Black Mirror: Bandersnatch*.

As suggestions for further research, this thesis could be a valuable educational resource in music and game design programs, or used for other practical projects, as a reference or guide for composers working on their own projects. Further research could apply the techniques covered here in other game genres, like horror or strategy games, exploring how dynamic music affects gaming experiences in settings beyond the examples of this thesis, and perhaps in music other than compositions for gameplay. Future studies could also focus on the next step, the implementation, playtesting, iteration and mixing process, and the best approach to address it. Expanding on the analytical framework provided in this thesis, research could be made on specific games, providing a structured approach to analyzing the game music in various contexts. As middleware and game engines evolve, this thesis could also serve as a foundation for exploring new tools that allow even greater interactivity with music, for instance examining emerging tools using AI for real-time sound manipulation.

The research of music for video games is more accepted and widespread today than it was in 2002 when Collins began researching for her book *Game sound* (2008) (Fernández-Cortés, 2021, p.15). Since the game industry keeps growing, we will probably see more universities set aside funds for ludomusicology in the future, leading to more research in the field. During my own research for this thesis, covering books, articles and other thesis from the last 15 years, I observed that a change has taken place, the early material seem

to do a comprehensive coverage of the field of audio for games, meaning that the content is somewhat similar. Resent research and articles published in *Journal of sound and music in games*, tend to focus more on a specific game or looking at an area of ludomusicology from a certain perspective, examples from 2024 being *Kingdom come: Deliverance and the aesthetics of authenticity* by James Cook (2024) and *Inhuman music and the monstrous-feminine* by Andra Ivănescu (2024) respectively. Sweeney (2021, p. 59) highlights the same thing in having seen a shift, the last ten years, from more general topics to more specific topics, as well as increased diversity, and articles on issues of identity, race, gender, disability and sexuality. This is an indicator that the field is growing, and with over 600 published articles on sssmg.org (in 2021), Sweeney believes that we will soon have subfields within the broader discipline of ludomusicology (ibid, p. 61).

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