Quest Driven Spatial Songs

Exploring how narrative structures of Quests in Games can be mapped onto songs.

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This paper examines the relationship between music recordings and narrative structures found in video games. It highlights the immersive and time-consuming nature of game quests, where players invest substantial time exploring virtual worlds to reveal the narrative. The paper explores the potential of spatialized music experiences, particularly in the context of Dolby Atmos and the concept of degrees of freedom (3DoF and 6DoF). It investigates the application of spatial algorithms and game engines' middleware to create immersive music experiences that dynamically adapt to the listener's spatial and temporal position. The research acknowledges limited instances of studies on compositional narrative design frameworks specifically tailored for completely spatialized music, particularly regarding the virtual spatialization of individual instruments. It recognizes that the prevalence of non-diegetic music in games, which serves to represent the player's emotional state, has impeded the exploration of spatialized music elements. Consequently, the paper proposes the adoption of narrative design frameworks derived from video games as a promising approach for songwriters to develop Quest Driven Spatial Songs (QDSS).

CCS CONCEPTS • **Human-Centered computing** • **Interaction Design** • **Interaction design theory, concepts, and paradigms**

1 INTRODUCTION

The advancement of Game Engine Spatial Algorithms (GESA) and audio formats such as Dolby Atmos enables the opportunity to create spatially and temporally adaptive structures for music presentation[1], [2]. The responsive nature of these algorithms heralds more possibilities of presenting recorded songs in exploratory formats. Like a building, the song will present a different musical/lyrical side depending on where and when the listener is in space-time. I refer to these styles of recordings as Quest Driven Spatial Songs (QDSS).

Many (computer) game narratives are built on "quests", the key signatures of quests are players are guided through game objectives ("quests") which lead to the players knowing the game world [3]. This paper regards "quests" as narratives that unfold across space-time. "Spatial" refers to sound/music objects that adapt to the listener's position in space-time, simulating change in distance. "Songs" are music with words.

My thesis investigates the possibilities of mapping narrative quest-like structures commonly found in games onto the structures of recorded music, with the following research questions in mind.

1) What narrative and design frameworks guide the composition of QDSS?
2) How do these frameworks guide the composition of QDSS? How may they be implemented?
3) What are the workflow optimization and integration challenges for QDSS in currently available digital audio workstations (DAW) and game design platforms?

The thesis is practice-based, which means the product is a written exegesis as well as a creative work (QDSS) that explores the implementation of these design frameworks.

2 BACKGROUND

Applications of advanced spatialization techniques for audio are often applied in the realm of sound design [2]. Music, often playing a non-diegetic role is often fixed to the audience's head, serving its narrative role in scoring the hero's journey[2], [4]. However, music apps that employ game mechanics often exhibit greater exploration of various degrees of freedom for the listener e.g. Björk's "Crystalline", a song chapter in the app Biophilia allows the listener to move in a forward direction through the music recording [5]. In virtual worlds, Ariana Grande's Fortnight concerts also allow the listener to move around the music world [6]. However, both instances only explore spatiality in a limited sense and the music remains locked to the audience's head, not rendering for changes in space [5], [6]. Other music-focused experiences include Mod's ACO Virtual [7]. This is a three-degree of freedom experience, where audiences can interact with the orchestra from a fixed point on a podium [7], [8].

Six degrees of freedom (6DoF) experiences for music are still a new and emerging field more widely explored in games, with an emphasis on sound design and diegetic music; diegetic music in these settings also tends to be single source mix downs, where individual instrument parts are not spatialised [9], [10].

Composers writing works for physical spaces write to suit the stage they write for e.g. writing slower tempo-ed pieces for reverberant spaces and faster tempos for less reverberant stages [11]. The virtual game worlds holding these music pieces present a new dimension of possibilities as composers find themselves in a position to design these "stage rules" e.g how acoustic signatures of the virtual space [2]. The subtext of this is that this blurs the boundaries between composition and design. The interactive nature of these works necessitates clear design goals which include scoping and design frameworks [12]. My thesis aims to present a possible scoping framework for space-time narratives in QDSS. This is an musical expansion of Zoran's [13] frameworks in space-time narratives.

3 DESIGN FRAMEWORKS FOR QDSS

3.1 Original Use Case and overview

Zoran's frameworks were originally designed for the written word and still photos, it has since been expanded for use in games narratives in the context of space-time [13], [14]. Zoran proposes that narrative space-time can be understood as "layers" [13]. Each "layer" works like a window, which allows storytellers to conceptualize story worlds holistically or by "layers" since there are large conceptual overlaps in the layers [13].

3.2 Space Layers

The topographical layer encompasses the "big-picture" design concepts [13], [14]. In storyworlds, these are possible places to be visited, size of places, characters, size and distance between objects, these concepts are applicable in the initial stages of game design as well [14]. In musical arrangements, parallel concepts of size and distance include the distance between instruments, the distance of relative pitches, etc.

The chronotopic layer focuses on movement [13], [14]. In games, this can be understood as what is attached to players and what is not[14]. In audio, there are parallel concepts [15]. Current concepts of spatiality in recorded music largely cater to an audience listening from a fixed point in space [15]. These concepts will have to be expanded in mixes where the listener is free to walk around e.g. what sounds follow the player when they walk about [2].

The textual layer relates to how audiences are guided through a narrative space [13], [14]. In games, these are cues that guide the audience through an experience [14]. Improper feedback cues and sound rules can confuse the audience and impact the experience, so composers likely need to include and consider the design of such cues as part of their composition decisions [16].

3.3 Time Layers

The "order" layer is the chronological order of a narrative, this be dynamic in interactive environments [13]. Applied to a song, it means that *Hotel California* does not necessarily have to start on a dark desert highway each time, and the ending can be a dynamic, user-input driven one [17]. "Speed" layer refers to a pace of the narrative, this includes jump cuts, real-time events, or slowed-down time [13], [14]. This is seen commonly in music apps with a disk jockey (DJ) feature where users can speed or slow down a record, much like a DJ [18]. "Frequency" refers to how often events repeat [13], [14]. Games often consider this in terms of "repetition fatigue", this concept is particularly applied in interactive game music structures that tend to loop music to save disk space and game resources [4].

4 CURRENT RESEARCH MILESTONES

This research is currently implementing Zoran's space-time frameworks in a 6DoF music experience titled "*Empires*". This is an apocalypse drinking song that reveals multiple lyrics and musical arrangements as the listener travels through the space. A prototype of the experience containing a facet of the experience is available in reality composer [19]. So far, a large part of the practice-based methodology has been to undertake various projects with aspects that inform the design of QDSS. This includes a piece entitled "No One Died", a horror theatre piece exploits sound ranges and the listeners' movements through space to reveal multiple points of view in what initially seems like a singular story [20]. This is designed to explore how listeners may be guided through a QDSS which can reveal multiple lyric variants spatially. Another highlight is a commissioned piece with the renowned Japanese Drumming ensemble Taikoz *When the Rain God Sings, Storm Lions are Born* [21]. This piece is a study on how musical triggers can be used to guide listeners through a spatially revealed piece. The mechanics of this piece is planned to be used in the quieter moments of *Empires*. These projects prioritize generated from lived experiences as part of the research methodology [22]. Many of the interesting unknowns stem from questions around workflow. The current processes from exporting from Digital Audio Workstations to Game platforms remain unwieldy processes especially when composers like myself regularly mix while composing. Some of these elements are aspects that I am looking forward to exploring in this mid-stage of my Ph.D.

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