

# The Functions of Music in Interactive Media

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**Abstract.** In this media theoretical and critical elaboration we intend to close the gap between music in static linear and non-linear interactive media. We will give a brief overview on media music perception and its historical development that enables us to recognize parallels between music in films and games and, thereby, uncover future perspectives of interactive media music. According to this, we will elaborate its narrative functions and potentials in order to widen the scope of the field where music meets interactivity.

**Keywords:** Interactive Media Music, Perception, History, Narration.

## 1 Introduction

Amongst all the arts, being interweaved by their cooperative coexistence in multimedia, music is one of the oldest and most frequently underestimated. In combination with image and sound it leads a nebulous shadowy existence, seemingly aimless or at least difficult to explain by terms like *background music*. Its tremendous importance only becomes apparent by muting it and experiencing the disillusioning lack of this unconscious something [1].

It is intended to be perceived subconsciously to directly access the limbic system, by-passing the rational thinking in the cerebrum, and affecting its immanent emotional load [2]. The suggestive power, which is thereby emerged through music, can sensitize the audience to emotional and analogous contents [3]. Furthermore, its combination with other media spans an association space, giving it an amazing clearness of content [4] which the musicologist and linguist Norbert J. Schneider calls a *semantization process* [3]. Music becomes meaningful as a narrative medium that does not even express emotions and mood, but also becomes a means for expression of associations and comments. These possibilities were not available from the very beginning. They had to be discovered and developed over centuries and to be established in the general listening habit.

## 2 History of Media Music

The linkage of music with other media has a tradition as old as music itself. With text and speech song emerges. In the Greek drama it is linked to stage scenery

and the dramatic plot. Within dance and ballet, music becomes a regulator for movement and gesture. The step from the scenic stage works of the renaissance towards opera interweaves music, plot, and text closer than ever before.

In these forms music is the dominating layer. It is not just restricted to the illustration of textual content, but construes and interprets it. Compared with this, music in drama and stage play has a less organic and intrinsic role but still has its artistic tasks. It prepares the audience for the emotional mood of the scene or summarizes it. It accompanies monolog and dialog and performs punctuation tasks [4].

Film is related to theater. However, the first occurrences of music in films—more precisely silent movies—were evidence of a retrogression of established theatrical traditions and conventions that had to be rediscovered. The primary task of musicians was to drown out the noise of the projector. They were free to play any music that fits reasonably to the mood of the scene. The selection depended on personal favors, mood, musical repertoire and skills. Classical works were performed next to banal pop songs and modern dances. They appeared in smaller and larger fragments and broke off in-between phrases quite often [4].

Obviously, these musics were not composed and thus hardly suitable to accompany the film medium. Adorno and Eisler already pointed out that traditional music structures do not work within the film medium [5]. Music had to become formally more open and unsealed. The composers had to learn to follow rapid short-term scene structures without the time for an extensive exposition or thematic treatment.

Finally, the talkie laid the technical base for the complete synchronization and introduced the layers of speech and sound. The music, so far amongst other things having the task to remedy the spooky aloofness of the silent pictures [5], was now free for a more selective and dramaturgically sophisticated use. The more it was displaced out of the focus of conscious perception towards subconsciousness, the more grew its value and importance for the film as a whole.

Today, music is an inherent part of films and developed a multitude of different forms and aesthetics according to the manifold film genres and functions that it accomplishes. For music in interactive media, especially in computer and video games, a similar development process emerges, giving us the opportunity to discover prospective promising perspectives of interactive media music.

### 3 History and Future of Interactive Media Music

At first, the unrealistic surreal sound effects of early video games, like *Pong* (by Nolan Bushnell, 1972) or *Super Mario Bros.* (Nintendo, 1985, music and sound effects by Koji Kondo), were a concession to the limited technical possibilities. But soon they established an own self-contained aesthetics for sound design that is closer related to music and cartoonish micky mousing effects than to cinematic sound design. They substitute not just real, but also non-existent sound effects, e.g., gesture illustrations like the upwards sliding glissando that illustrates a jump movement, and motivic cues that reward picking up an item.

Technical restrictions forced the music to be relatively simplistic. In *Asteroids* (Atari, 1979) it consists of only two alternating tones, permanently disturbed by sound effects on the same one and only audio channel. The music of *Space Invaders* (by Toshihiro Nishikado, 1978) is a repetitive sequence of four stepwise descending tones, illustrating the approaching of hostile UFOs. The nearer they come, the more do game-play and musical tempo increase, causing a hectic pace. Karen Collins gives further exemplary discussions of aesthetical aspects of C64 and Atari games music [6].

*Space Invaders* is one of the first and rare examples from the first decades of games music, that demonstrates its dramaturgic use. The usual musical accompaniment is just a nice-to-have background feature without any narrative functions, as can be observed still today. Most games allow the player to switch it off in the setup menu. Of course, this optional kind of music cannot be of any importance and is deemed to be redundant or at least insignificant. The game must be and is playable and understandable without it. As well as film music did more than half a century before, interactive media music started from the outset apart of all the achievements of hundreds of years of music history.

A turning point was the improvement of sound hardware with more sophisticated synthesis abilities and the introduction of the MIDI standard in 1982. It constitutes a homogeneous musical interface for home computer systems as well as for professional sound studios, enabling musicians to create musical data without programming abilities via graphical high-level interfaces.

Not just the composition became more professional now, but also its performance within the games. One of the highlights of the MIDI and audio based music engines was and still is the *Interactive Music Streaming Engine (iMuse)* of Michael Land and Peter McConnell [7]. It offers a number of automated arrangement techniques, enabling the composer to write music that can be performed and organically adapted to the gameplay without any unmusical breaks or cuts. It was the reversion to the insight that film music made approximately fifty years before: There should be neither an antagonism of character and expression between music and film, nor an indifferent relation [4].

But with the upcoming of the CD-ROM medium in the 1990s interactive media music made a step back. The big memory capacities, now available, led into temptation to use memory intensive audio formats like Wave, MP3 or CD-Audio. These provide high-quality sound but are completely static. Consequently, the indifferent relation between music and interactive scene, the abrupt unmusical cuts within the musical accompaniment are still predominant today.

As well as film music once had to outgrow the structural limitations of traditional music, interactive media music has to find new approaches to coalesce with the interactive medium. Composers became aware of the necessity to compose in a latent way so that asynchronous cuts do not appear too flashy. Or the hard cut is smoothed by a short cross-fade and becomes a still asynchronous soft cut. Others write their music as sequential fragments that can be rearranged in real-time. Newer solutions from the last few years incorporate an extensive use of multi-track arrangement and real-time mixing, an overview is given in [8].

This will pave the way for a more sophisticated use in terms of narration and dramaturgy.

## 4 Narrative Functions of Music in Interactive Media

In every artistic work its piece-parts and formal aspects are not just present for aesthetic reasons, but to support mediating its content. This is known as the *dialectic unity of form and content*. Hence, music is not included in multi-medial environments just as an end in itself, but performs vital narrative functions.

### 4.1 The Cinematic Heritage

A very basic and widely accepted high-level classification of the film music's narrative functions is that of Eisenstein et al. [9]. They distinguish between audio-visual *Parallelism*, comprising music that follows and expresses the visual content, and *Counterpoint*, describing music that controverts the scene. This scheme was extended by several musicologists like Pauli [10] and Thiel [11]. They introduced a third category—which Thiel calls *Affirmative Picture Interpretation and Illustration*—comprising music that adds new non-visible content but does not contradict the scene.

This very coarse scheme is hardly suited to distinguish the manifold intentions behind the use of music. That is why Zofia Lissa's very meticulous detailed categorization [4] became important. She distinguishes the following eighteen categories of functions the music could perform (or are related to music):

1. Musical illustration of movement and sounds (known as *Micky Mousing*),
2. Emphasis of movement,
3. Stylizing of real sounds,
4. Representation of locations (geographic, ethnic, social),
5. Representation of time (for historical associations),
6. Deformation of sound (for alienation effects),
7. Comment (audio-visual counterpoint),
8. Source music (diegetic music),
9. Expression of (actor's) emotions,
10. Means of immersion,
11. Symbol (e.g., national anthems),
12. Anticipation of subsequent actions,
13. Enhancement and demarcation of the film's formal structure,
14. Multi-functionality of music (the functions are not mutually excluding),
15. Sound effects (and the mixing with music),
16. Speech/Dialog (e.g., punctuation tasks of music),
17. The function of silence ('The rest belongs to the music as well.' Stefan Zweig),
18. Non-functional aspects (for inner-musical and aesthetic purpose).

Even today, half a century later, Lissa's functions are still up to date and only need to be supplemented by a few new and advanced functions of contemporary cinematic practice. An up-to-date approach is presented by Wingstedt [12].

**Emotive Class:** emotionalize content and acting;

**Informative Class:** communication of meaning; communication of values; establishing recognition;

**Depictive Class:** describing settings; describing physical activity;

**Guiding Class:** attention guidance; mask (out) unwanted or weak elements;

**Temporal Class:** provide continuity; define structure and form;

**Rhetorical Class:** comment, make a statement, judge.

In connection with his temporal class, Wingstedt states furthermore: “In interactive non-linear media, such as computer games, music’s ability to provide continuity is an important quality with strong potential.” [12] Likewise all the musical functions can be transferred to interactive media.

However, the only established functions in games are those providing the feeling of immersion into the scenario and a superficial dramatization of action scenes. Occasionally, some functions of Wingstedt’s informative class appear, in terms of a parallelism based recognition establishing use of the leitmotif technique. Hence, interactive media are far behind their possibilities and even behind ancestors. Especially the contrapuntal functions seem completely unknown to game developers. Even issue-related literature does not invest much attention into a professional music conception [13,14].

#### 4.2 Take a Stand on Interaction!

Since the player is primarily part of the real world he perceives diegetic as well as non-diegetic information, the comment of a non-diegetic contrapuntal music, too. Here a major distinction to linear media emerges: extra-diegetic film music cannot be heard by the actors on screen, thus, has no influence on the plot. But in interactive media the player acts in the virtual world and non-diegetic information can influence the diegesis over him. Interactive media music necessitates a different conception!

It cannot refer only to the virtual scene, surrounding the player, demoting him to an external outsider, but take a stand on himself and his acting. By music’s associative power it is possible to make it clear for him what his actions cause and mean. It can laud him for doing something good and reprove him for bad morally condemnable actions. This educationally and even therapeutic interesting potential lies idle!

Moreover, music can be used as a regulator for the player’s attention, emotional state, and playing behavior by an adaptive musical soundtrack that dynamically reacts and mediate a personalized playing experience. It can be a powerful instrument to ensure and fine-tune the type of a particular scene (action, creepy, sneaky) even if the player acts in a different unintended way. Furthermore, music can be used to influence the player’s decision process by accenting some associations and masking out others.

Till this day this potential is widely unused! Game developers have to become aware of the ontological difference between linear and interactive media in all its facets and apply music as an active essential participant in the multimedial interplay and dialog with the player.

## 5 Conclusions

This paper presented a media-theoretical attempt towards closing the gap between linear and interactive media music. The analysis of film music history uncovered many parallels to the development of interactive media music (technical limitations in the beginning, rising professionalism, dealing with the problem of synchronization), and indicates promising future perspectives:

The synchronization and organic correlation of musical and interactive elements is one of the most challenging technical problems. New musical structures have to be found to enable flexible adaptive performances. On this technical base interactive media music will rediscover and widen its rich pool of narrative functions for which we have shown that interaction must be an integral part to open up the great potential currently unused.

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