"What's The Score?" Unlocking the Hidden Sounds of Video Games

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Introduction

Ludomusicology - the study of the music and sound effects experienced in video games - can be a complicated endeavour for researchers, scholars, and digital humanists. Much of a game's audio data is obfuscated through layers of code, compression, and digital rights management software. Additionally, official releases of game music, such as commercialized soundtracks, divorce audio content from its context within a game. As a result, conventional methodologies prevalent in Ludomusicology, such as analytical play (Summers, 2016) and critical listening approaches, lack the capacity to adequately investigate the layers of interactivity within the software that actually execute and manipulate sound.

These layers "between the operations of a machine and the instructions given to it by an operator offer a fascinating archaeological study" (Burdick, 2012) as well as what we believe to be an intriguing way to analyze games. However, there is currently a notable lack of academic tools to enable this sort of analysis. Although some types of software exist to extract audio and game code, they generally fall into the realm of modding or hobbyism (Nosov, 2017) and often flagrantly circumvent copyright legalities. Within the academic setting, there have been very

scant efforts to formally seek out, sort through, and document these technical attributes.

A Practical Prototype

Through the creation of a prototype database, we will present a user-friendly platform to enable a technically holistic scholarly approach to video game sound. The core pillars of our project are *accessibility* and a *fullness of study*. It is vitally important that our project can be utilized by people from a variety of academic backgrounds and technical skill levels, however, this accessibility is not meant to reduce the *fullness* of the study. It is important that data is not omitted or "dumbed down," as this may prevent the full complexities of game audio to manifest themselves. Decompiling a game can help us to interpret it (Bogost, 2007), and facilitating direct access to a game's digital assets would be an invaluable precursory research tool. Our ultimate goal is to present both the original data, as well as additional descriptions and classifications, using a highly intuitive interface.

Using Sid Meier's *Civilization IV* as the source of our data, we will create a web database that displays game sound in relation to its associated code, while at the same time providing additional context and searchability. *Civilization IV* was chosen due to the openness of its data (much of the sound is intentionally stored in easy to extract formats) with the developer actively encouraging modding and community engagement with the game code (Caudill, 2005). Although the game engine uses C++ and Python, the programming team encoded audio data in XML files for straightforward interpretation and editing. This makes *Civilization IV* ideal for prototyping, allowing for rapid experimentation with various analysis and presentation approaches.

A New Musical Methodology

We will first use Altova XMLSpy to extract and organize code data from the game, taking advantage of its ability to quickly parse XML data into tables while prominently displaying identifiers and

schemas. Once we have located a set of sounds that are appropriate for our case study, we will then integrate them into datasets (CSV and SQL) that can be presented on the web using a simple WordPress configuration. With this infrastructure in place, we will append our data with additional contexts, using the sound classifications theorised in the seminal work *Game Sound* (Collins, 2008) as a starting point. Audio will be classified based on its relation to diegesis (diegetic and non-diegetic) and behaviour (dynamic, non-dynamic, adaptive, interactive). Other musicological considerations will include: function, signification, discographic information, and sound description. In addition, we will link to *satellite sources* (Summers, 2016) - such as interviews, wikipedia entries, manuals, production documents, and composer notes - to create a set of digital liner notes that embed the project in broader discussions of Ludomusicology.

The playback of game audio is also of primary importance, and will be accomplished through an open source web player such as the one developed by FreeSound.org. We are particularly interested in incorporating technical audio analytics such as spectrogram displays (visual interpretations of frequency data) as well as information regarding file types, programming modifiers (volume, pitch, pan) and, most importantly, programming cues that "trigger" in-game audio events.

Conclusion

Due to the complexity of their presentation, video games are not often analyzed in the same manner as more traditional humanities texts. Our hope is that through the hacking, extraction, and presentation of game resources, we can begin to think of video games as expansive digital texts - ones that can be researched with the same tenacity and rigor as more established formats. Perhaps MacKenzie Wark summarized the role of such hackers and researchers best: "We produce new concepts, new perceptions, new sensations, hacked out of raw data. Whatever code we hack, be it programming language, poetic language, math or music, curves or colorings, we are the abstracters of new worlds" (Wark, 2004).

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