Dying Dreams:
A Computer Game Made Entirely of Audio

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Date of Final Presentation: 7 Dec 2016

Abstract

Since their inception, computer games have always had a distinct focus on presenting themselves with their visuals. This is so much the case that they are nearly always referred to as "video" games. Though sound has also long been a part of them, it is typically considered ancillary to the visuals and interaction, which end up being their primary components. Unfortunately, this prevents a great number of people from playing them: those who cannot see. Such people are forced to play video games without much knowledge of what is going on, leading many to avoid them entirely. This problem has not gone unnoticed, however, and a number of "audio" games have been created in response. These games try to solve the problem by creating gaming experiences specifically for the blind population. Rarely, however, have they attempted to translate the experiences present in traditional video games over to an audio format, and that is exactly what this project aims to do.

Dying Dreams adapts the experience of a role-playing video game to a format where all information is presented to the user aurally. The game's story is primarily told in the form of second-person present tense narration in the vein of multi-user dungeon interfaces and certain works of fiction, allowing the player to be made aware of what is going on at all times. Battles in the game use this same descriptive style, and were chosen to be turn-based so as to allow the user ample time to listen to the current situation, and select actions appropriately. Three actors were kind enough to lend their voices to the game, allowing me to record them and direct their performances. Given the vital importance of audio to the project, *Dying Dreams* was recorded with a dedicated 3D audio microphone so that the user can hear all narration clearly, as well as be able to ascertain where characters' voices are coming from in the game world. The full game takes approximately three and a half hours to complete, and contains eight distinct battles, all with unique voice lines and challenges to overcome. It is my hope that *Dying Dreams* will bring the pleasure of playing games to a new audience, and show that traditional computer games are not restricted to video, but can also be adapted to other formats.

Introduction

As they are currently, a vast majority of computer games appeal only to those who can see. Those with significant visual impairments are unable to play such games because of their heavy focus on presenting information visually. As gaming continues to grow into an industry

worth billions of dollars annually, games must continue appealing to a progressively wider audience, including those with visual impairments. Games are also largely meant to be fun experiences that a wide range of people can play, and many visually impaired people have expressed interest in engaging with them [1, 2]. As such, there exists both a want and a need for more games which are accessible to this audience.

Of course, I am not the first person to have thought of this, as games which are accessible in this way have existed for decades. For example, multi-user dungeons (MUDs), which are online, text-based computer games, have existed since the late 1970s [3]. Given their text-focused and highly descriptive nature, those who cannot see the text for themselves can use software to read aloud what is written on-screen and understand what is occurring in-game [4]. Some of these principles for user immersion and embodiment had been passed along to future virtual environments, but, as graphical technology has gotten better, visuals have become increasingly prominent [5]. Though MUDs might have fallen somewhat out of favor, recent years have brought the development of "audio games," computer games which use audio as their primary or sole method of delivering information [2]. A majority of these games do not attempt to recreate existing gameplay styles, but rather aim to generate new experiences, often specifically for the blind [1].

Audio games are still rare in the modern gaming market, and very few try to replicate the gameplay experiences made popular by video games. As such, it is my intention to create an audio game which attempts to recreate a gameplay experience popular in video games in an audio-only format.

This game, which I have titled *Dying Dreams*, is an audio, turn-based role-playing game. It builds upon current audio games by appealing to both veteran gamers and newcomers alike, attracting gamers looking for a somewhat new experience, as well as the visually impaired who wish to experience games for the first time.

Problem Domain

This project is grounded in the field of computer games. More specifically, since it lacks visuals, it would be considered an audio game. However, describing *Dying Dreams* as such is somewhat misleading. Many audio games do not place themselves into traditional video game categories, such as RPG or adventure, instead generally creating experiences unique to their

aural medium. For this project, however, I have chosen a different approach, adapting a long-standing video game genre, the RPG, into the form of an audio game. This is done not simply with the hope of being unique, but also so that the game might attract fans of both video and audio games. Another area of computer science of note for this project, which is described in further detail later in this paper, is three-dimensional audio. It is used fairly often in audio games to provide a better experience for player immersion, so a certain degree of 3D audio is used here as well.

Literature Search

The research conducted for *Dying Dreams* required discovering sources on a number of quite varied topics. Sources are primarily on computer games and the visually impaired community's interactions with them, but also include information on storytelling, computer game immersion, and the technologies used to develop this game.

Given that nearly 40 million people worldwide are blind, it is not surprising that a fair number of visually impaired people would be interested in computer games. Though still uncommon in the market as a whole, audio games, which is to say, computer games with no visual components, have increased in both number and popularity since the mid-1990s [1]. Though initially smaller efforts rooted in personal experience [1], the community of people creating and playing such games has grown to the point where a number of active communities online now create audio games [2].

Prior to the advent of audio games, a number of computer video games had been adapted to be played by the visually impaired. The most notable example of this are multi-user dungeons (MUDs). Since they interact with their players only via text [3], a number of people have used screen readers to read off this information, making them open to the visually impaired [4]. This was not a perfect solution, as ACSII art is sometimes found in these games and reads out as gibberish to those using screen readers, and visually impaired people who play such games still need to be proficient in using a full keyboard [4]. As technology has progressed past the need for text-only communication, a need for better aural immersion in modern virtual environments has been noted, yet is still rarely considered given the ubiquity of video in virtual spaces [5].

Storytelling in audio games, and audio-focused media in general, has relied heavily on the models found in computer games. MUDs made popular the technique of second-person

present tense writing, where the player is always told what "you" are doing and what effects this has on the world around "you" [3, 4]. To this day, storytelling – or at the very least the presentation of textual information – in computer games is still much the same as it was in the MUDs of the 1970s, being very descriptive, direct, and presented in the second person. Some forms of media, however, have attempted a greater degree of creativity with this style. The podcast *Within the Wires* presents its story entirely through second-person narration, but makes this literary structure far more engaging by giving the narrator a personality [6]. This, and other works of literature, have given second-person stories a greater amount of depth and complexity.

As far as the technology used in this project, I became familiar with some of the hardware and software created by Andrea Electronics. This included their Superbeam 3D Recording Ear Buds (SB-205W), and Audio Commander software, which allowed for efficient and quality recording of 3D audio [7]. Additionally, the Unity game engine was used to create this game, and, though I have used it in the past, I became better acquainted with the engine's documentation on audio [8], and its scripting language [9].

Solution

Dying Dreams is a story-focused, turn-based role-playing game presented to the user exclusively through audio. The major idea behind the game's design philosophy was that it should be fun and easily playable for anyone who can hear, not just the blind or sighted. The goal was to make *Dying Dreams* more universal and appealing than most other audio games.

In order to analyze the design ideology and creation of the game, it is perhaps best to divide this solution section into the following three parts: story, gameplay, and technology.

Story

Despite my prior experience with writing both computer game scripts and short stories, *Dying Dreams* was still a unique challenge, one which required a number of careful design choices. The first decision made in regards to the story was that it ought to be presented to the user primarily in the form of second-person, present tense narration, allowing the user to feel most present and engaged in the moment. Though rare in literature as a whole, this style has seen success in the past, having been used in MUDs [3, 4], and other works which want the story to speak more directly to the user, such as in the podcast *Within the Wires* [6]. Like MUDs, *Dying*

Dreams directly tells the user exactly what it is they are doing, what the world around them is like, and, in battles, what the effects of their gameplay choices are. Unlike MUDs, and similarly to *Within the Wires*, the narrator is not factual and unbiased, instead having a distinct personality in order to keep players interested. Surprisingly, perhaps, it is extremely important to note that the game's narrator is quite snarky and cynical, almost to the point of condescension. This came about naturally when developing the game's story, but was also chosen with the visually impaired community in mind. Many visually impaired gamers are just as serious about playing games as anyone else, and dislike it when games baby them, treating them with fragility and little respect [1, 2]. So, a snarky narrator allows the game's story to challenge people, treating them equally no matter who they are.

Additionally, as is often the case in computer games, the player character never speaks, allowing the player to bestow them with whatever personality and physicality they see fit, further increasing immersion. Two primary characters, Helen and Ana, were written for the game as well. Limiting the story to only two major characters besides the player character allows for their personalities to be better developed over the course of the story, and allows the player to more easily keep track of their locations and situations.

Gameplay

Gameplay in *Dying Dreams* was meant to be extremely accessible, especially for the visually impaired, while still having the challenge and satisfaction present in most computer games. The game makes use of only five buttons on the keyboard: the 1, 2, 3, and 4 keys, and the spacebar. These keys in particular were selected because they are located in the same place, the top for numbers and bottom for spacebar, in almost all keyboard configurations. The game's tutorial directs players to these locations, allowing anyone to find and use them regardless of what computer they have, if they are visually impaired, or if they have little experience using keyboards.

Dying Dreams consists of sections which describe what is happening in the story (called "scenes" from here on), and sections where the player must fight enemies (called "battles" from here on). Scenes are straightforward affairs where the story is advanced, and the player experiences them much like an audio book, except with the narrator speaking directly to the user. Players can skip lines of dialogue in scenes with the 4 key.

Battles in the game are similar to many turn-based role-playing games, and this style was selected so that the situation on each turn could be carefully analyzed and listened to before proceeding. The player is given all the time they need to select the actions of each of their party members, then the game's enemies act, then your party goes again, and this cycle continues until one side has depleted the other's health. On each party member's turn, the player can select from four actions. Attacking, selected with the 1 key, has that character attack a selected enemy. Defending, selected with the 2 key, has the character defend themselves, taking less damage for the remainder of the round. Special Attacks, selected with the 3 key, are unique to each character, have various effects, and more of them are gained as the game progresses. Perhaps the most unique and purposefully designed aspect of the game's battle system is the ability to "sense" the current situation, which is selected with the 4 key. Most RPGs present a good deal of information visually, with the most important piece of information typically being characters' health. "Sensing" is how *Dying Dreams* presents such information to the user. Upon choosing to sense everyone's status, which does not use up the current character's turn, the narrator will describe the general health of all party members and enemies. This provides vital tactical knowledge to the player. For example, if one character is in critical condition, then the player can have Helen heal them. Or, if an enemy is about to faint, the player can have the party attack in order to finish them off. Along with unique and challenging battles, this provides players with the depth and complexity they would want from an RPG, and gives them control over and knowledge of the situation even without visuals.

Two computer game staples, pausing and saving the game, have also been included. At all times, players can pause the game with the spacebar, and exit while paused if they so choose. The game also saves quite often, returning players to the most recent voice line if the game is exited while in a scene, or to the start of the battle if the game was exited during one.

Technology

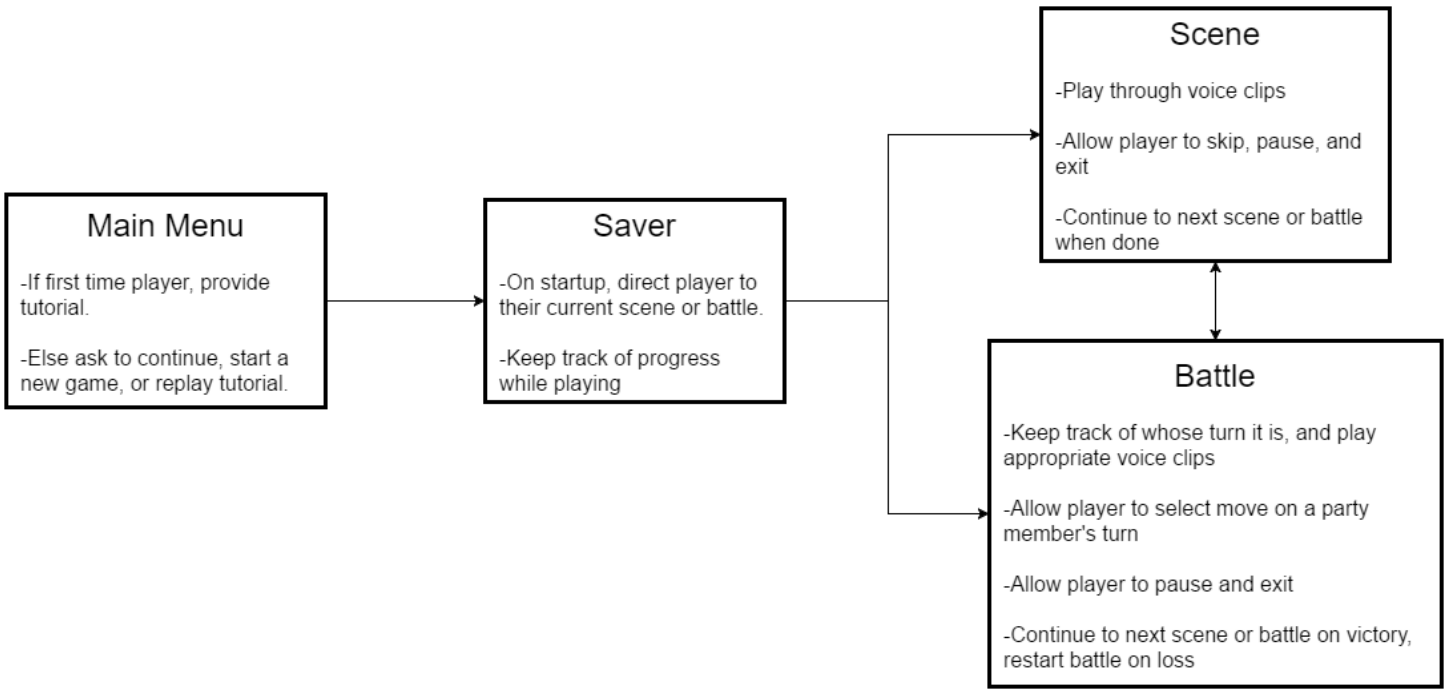
Given the total lack of visuals in *Dying Dreams*, it was incredibly important to record quality audio which immerses the player into the game. All audio was recorded using a 3D audio microphone, and this additional 3D audio aspect was used carefully and sparingly, so as not to end up with a poorly-realized addition, or overwhelm or annoy the player. Most notably, the game's three main voices, the narrator, Helen, and Ana, each sound like they are coming from a

different place. The narrator sounds like they are coming from the inside of the player's head, Helen is typically on the player's left, and Ana is usually on the player's right. Though characters will often move around when appropriate during scenes, this basic center, left, right positioning is kept, at least to an extent, at all times, so that the player can more easily recognize who is speaking and can locate them in the game world. Sound effects, though very sparingly used so as not to overwhelm, are also recorded in 3D, with the most notable sound effect being used at the game's start so as to draw in the player.

Given my experience with it in the past, its ability to deploy quickly on multiple platforms, and its solid audio framework, I selected Unity to be the game engine used to create *Dying Dreams*. I became more familiar with how audio works in the engine, including the best methods for compression and playback of audio given the large quantity of high quality audio files used. All of the game's scripts were written in C#, and in accordance with Unity's scripting protocols.

Below, one can find a flowchart showing a highly simplified rendition of the structure and roles of the game's classes. Main Menu directs players either to the tutorial or to continue, Saver saves and loads the player's current game state, Scene goes through story scenes, and Battle handles the game's battles. As battles necessarily have a number of things to handle, including many possible player inputs, basic enemy AI, and hundreds of voice lines, Battle is by far the longest and most complex class in the game.

Figure 1. A basic flowchart of the game's technical structure.



Results

Dying Dreams takes approximately three and a half hours to complete, tells a full narrative arc, includes character progression both in terms of story development and battle abilities, and contains eight battles. Unique pieces of dialogue were written and recorded for every scene and battle, resulting in a script that is approximately 35,000 words long, about on par with a short novel.

The three people who lent their voices to the game's characters all have a great deal of experience with acting, and allowed me to record their work and direct their performances. Yan Bergquist, the most experienced of the three and a recent graduate of the University of Florida's Theatre BFA program, was given the greatest amount of acting work, being the voice of the narrator and performing several miscellaneous voices. Jamie Kerzner and Sarah Steinman performed the voices of Helen Abello and Ana Batel, respectfully. While recording their lines, I had them place themselves around the microphone as though it were the player character. This resulted in 3D audio recordings which sound accurate to the characters' locations in the game world.

Though it is common for RPGs to include repeated fights against the same sort of enemy, such tactics were not used here, as it would have done nothing to make the game more complex or interesting. Instead, each of the eight battles is different, with unique enemies and challenges. Battles are also not always straightforward, with several important elements of the story being revealed as players fight through some of the later battles, and a few battles requiring players to figure out unusual strategies.

In addition to the organization done directly through Unity's user interface, the game was created with approximately 5,500 lines of C# code. The Battle class was by far the longest and most complex due to the number of things which must be kept track of in each battle, and the sheer number of unique voice lines which will only play during certain instances. Also of technical note is saving data. Given the frustration many have with manually saving data in games, making the saving convenient, automatic, and as streamlined as possible was important. As the game is a relatively simple one, the save data requires only two integers and a very short string. They are saved, without interruption or need for player interaction, whenever progress is made.

Thus, *Dying Dreams* is a fully-formed computer game. Though it is in some ways simple, the experience given to the player is unambiguous, complete, and, hopefully, fun.

Conclusions

For this project, I decided to create a computer game with no video, meant to be experienced equally by any with ears ready to hear it. With that idea in mind, *Dying Dreams*, a turn-based role-playing game, was created. It was made to both emulate certain aspects of past popular video games, while also using specific parts of its aurally-focused medium to its advantage.

In completing this project, I learned a great deal about game design, sound design, writing, and the visually impaired community. By combining what I managed to learn from all of these different sources, I found that, regardless of how successful one might find this particular project, it is most definitely possible to create a computer game which is both accessible to the visually impaired and which can appeal to a wide audience.

People's imaginations are far more varied and deep than we tend to give ourselves credit for. *Dying Dreams* was my attempt at converting the pleasures of video game playing over to audio, but it is certainly not the only way to do so. In the future, I hope people with a creativity different from my own continue to think of unique gaming experiences. Games such as this one can and should become more complex, engaging, and fun. And really, having fun is ultimately the point of all gaming experiences, no matter who you are and what it is you can and cannot do.

Acknowledgements

I would like to extend my most sincere thanks to a number of people who supported my work on this project. Thank you to my advisor, Dr. Shaundra Daily, for her openness, positivity, insights on design, and for letting me embark on this crazy endeavor in the first place. Thank you to Yan Bergquist, Jamie Kerzner, and Sarah Steinman, the three actors who let me rope them into doing voice work for this game. Yan, especially, was instrumental in giving this game's story the life and energy it needed. Finally, thank you to several members of the UF English department, including David Leavitt and Dr. Sidney Dobrin, for their kindness and enthusiasm for this project.

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Biography

Nicola Frachesen was born in Miami, Florida on March 20th 1995 to an unusual name and a birthday which usually falls on the spring equinox. She completed her secondary education at Coral Gables Senior High School, and then promptly moved to Gainesville to attend the University of Florida. She is currently obtaining a BS in Digital Arts and Sciences there, an experience she has generally found enjoyable, varied, and fascinating. For as long as can be remembered, she has loved tinkering with design, language, technology, and the ways in which they interact. In the spring of 2016, she was fortunate enough to have had an internship at Immersed Games as a user experience designer. After she graduates from UF at the height of 2017, she plans to write (furiously), read (calmly), design (curiously), and gain some form of meaningful employment involving those passions.