

Christopher White
Student No: 1917314
Development
Element 2b

Introduction

For this assignment I have chosen to build a video game as a form of interactive instrument. It has both sample based audio and music elements which are triggered or change based on the player's interactions with the game and movement through it. Additionally, it continues a thread from my term 1 assignment presentation on marketing a single for release called 'A44' by The Weasel Kickers. A music video was shot and edited by the band for an upcoming single and the resulting game contains a 'cinema screen' where the player can stop, watch and listen to the new single and music video. But the screen will only play the video from release day. The game will be released ahead of release with placeholder 'support films' or spoof ads and guidance for players to return for the release.

The game controls\instructions are included as both a .txt and .pdf file in the folder once unzipped. They are also included at the end of this essay as an addendum.

Research

The decision to build a game stemmed from a previous marketing assignment and it's research. Tileyard Education organised an interview and student Q&A with Malcolm Garrett, a graphic designer well known in the music industry. The interview discussed his work designing album artwork, particularly vinyl, and he referred to it as 'creating a visual space' (Garrett, 2020) for a release. I asked Malcolm if he'd been involved in creating a digital space for an artist or music release and he mentioned a game he'd designed for The Spice Girls. Considering the increasing popularity of video games, online and otherwise, partly fuelled currently by more people staying at home, it seemed the ideal medium to help market a new release without the benefit of being able to tour it. Malcolm also discussed broadcasting concerts by Orbital and Oasis in the infancy of internet web-casting in the early 1990s. This led to the thought of a live stream of the video or a live performance into the game on it's release. As this was technically quite advanced considering the learning curve of building a game, the plan was adjusted to have the video play inside the game, but the video would only be available from the release date.

Many of the concepts used in the game are taken from the book *Game Audio with FMOD and Unity* by Ciarán Robinson. This explains the basics of building a 'First Person Shooter' (FPS) style game with the free game engine 'Unity' and how to more flexibly integrate and manage audio within the game using a software package called 'FMOD'. (Robinson, 2019). FPS games started with games company ID Software's 'Wolfenstein 3D'. They were then popularised by the 'Doom' franchise by the same company who then innovated with it's follow up 'Quake'. The Quake series of games had an adaptive industrial rock soundtrack recorded by Nine Inch Nails (Wikipedia.org, 2020).

Earlier game audio was often MIDI based, a type of music performance data that triggers sounds on the computer's soundcard or onboard chip, as discussed in a blog on the website of audio industry supplier Thomann (Thomann, 2019). This reduces the amount of data storage needed to deliver a game and load it into a computer's memory, data storage being much more restricted in the past than it is now. This lends itself to loop based music with interest created by triggering variations, either through a player's actions or at random based on probability programmed into the game. This is adaptive music. It's non linear and changes to suit the action or mood of the game.

As computer memory and data storage became cheaper and more readily available, games like 'Quake' could use more traditionally produced audio which uses larger amounts of data. Due to the non linear nature of the action in a video game, it is difficult to sync up linear music's development with the player's experience of the game. For this reason, games like Quake use ambient and 'moody' soundscapes which can be easily looped or changed part way through as rhythm and a

sense of progression is less defined in the music.

Design

In the case of this production, the purpose of the game was to market the music being released and so it needed to be a key component in the gameplay. Other games utilizing rock or band music often used the tracks in full as diegetic music, that is music that doesn't adapt to the players position in the game, it can be thought of as 2D and commonly worked into the story as music on the TV, radio or other forms explainable by the situation (eg – the car radio in the GTA series). Although the single here is a rock track, it features a driving beat with little variation throughout the song. It could therefore be cut up and used in a way similar to how electronic loop based music is more commonly used in games.

By editing loops out of an instrumental mix of the single, the key idea was to have the in game music develop as the player's score increases, building excitement by progressively adding instrumental layers and moving from verse to chorus loops. This would also work in the marketing as 'teaser audio' as the game would be released ahead of the single and music video. The game is to be released online through a browser and hosted by a website. The original version will have placeholder video on the cinema screen and a sign indicating the player should return on the release date for the music video and full track. The browser version can then be updated during the night before release, which solves the problem of people downloading the original version of the game and potentially not coming back for the update on release day.

Aside from it's marketing function, as a game it needed to be playable, engaging for fans of the band and ideally to new audiences. Also referencing the interview with Malcolm Garrett, it was important to tie together elements from the song, music video and game which can in turn influence the other marketing and branding surrounding the release. The music video was shot on zero budget using phones by members of the band, partly due to the limitations of the lockdown during which the video was shot. The game visually references some of the ideas, visuals and themes from the song and music video to tie them together.

The game starts near the end of the A44 as the road enters the game version of Aberystwyth. The music video depicts a beach at the end with the words 'Don't Touch' drawn in the sand. This is also represented in the game, as are the lead singers experiments with green screen which resulted in a disembodied head floating in the sky, both in the music video and game. The singer also filmed a skit dressed as a character from the music video, inspired by testing an earlier iteration of the game. This became the clip broadcast on the TV next to the player as the game starts. Design wise, it also reflects the comedy, sometimes juvenile nature of the band and has a surreal sense of humour that references both the band's name, 'The Weasel Kickers', and it's influences such as Monty Python, The Bonzo Dog Doo Dah Band and Half Man Half Biscuit. The player has to collect shoes for a deified giant weasel and fight off weasel bears, chickens and the coronavirus with a rocket launcher that fires shoes. At intervals through the game, a disembodied voice gives instructions relating to life in lockdown in a barely audible and confusing way, lampooning the UK governments Daily Brief and press conferences during the health crisis. NHS health pickups restore your health and trigger a round of applause. The references to the pandemic ensure the game is relatable, albeit surreally, to a wider audience. While it may be considered in poor taste, the band generally feel that nothing should be off limits to comedy. It helps to bring about discussion of sometimes awkward or taboo subjects and can be cathartic to laugh at things that can cause harm. The memes and Tik-Tok videos that flooded the internet at the start of the lockdown illustrate this and are a natural way to bring people together.

Implementation

FMOD is a piece of software which can be integrated into the Unity game design engine to manage audio assets. It has features similar to a DAW (Digital Audio Workstation) with a mixing console that can be used to balance relative volume, add effects and create automation and 'scene' snapshots that can be recalled by actions within the game. Areas within the game can be designated as 'triggers' to either play a piece of audio or change the mixer settings. In example, when the player steps into the building with the statue of a giant weasel, an audio sample is triggered which is an instruction to 'Find my shoes!'. A mixer snapshot is also triggered which adds ambient reverb to the player's actions and sound effects such as footsteps, jumping and landing to better indicate the environment is one of stone and metal.

Unity also uses C# code script which can be written or adapted from pre existing code. The score script in the game has been re used from the book's resources. When a pickup is collected, it triggers an audio sample of a voice counting how many pickups have been collected so far. A sidechain compressor simultaneously reduces the volume of the in game music in a process commonly called 'ducking' in broadcast. This helps the voice count be heard more clearly as the music momentarily dips in level and then returns once the audio sample has finished playing. The script also starts the in game music at the start and causes it to progress to a new music loop each time a pickup is collected. When enemy fire hits a player, not only does this play a sample to indicate the player has been shot, but it triggers another mixer snapshot which filters out the higher frequencies in the game audio and plays a sample of the player's heart beating. This is a common affect in games and recreates the sense of a player feeling 'woozy' when hit hard.

A particular challenge was the cinema screen playing the music video and it's attached audio. It isn't currently possible with FMOD and Unity to sync playback of video with audio that's hosted separately in FMOD. By ensuring the Unity audio engine is still active as well as FMOD's, it was possible to have a video play on a surface in the game as the game starts. The video and it's audio is then looped by Unity. To ensure it didn't clash with the general in game 'battleground' music, a Unity object called a 'sphere collider' was setup as a trigger surrounding the cinema screen. As the player enters it's area of influence, another mixer snapshot turns down the volume of the 'battleground' music as the player approaches the screen. Simultaneously, the 3D sound elements of the video player cause the video audio to get progressively louder as you get closer to the screen. A bit of tweaking of the size of the collider and the 3D sound parameters was needed to create a natural sounding overlap as the music essentially cross fades from one to the other as you enter and leave the area, though it was difficult to achieve this satisfactorily. Regarding volume, the video's audio playback is significantly louder than the rest of the game audio to draw attention to it and to give the impression of a concert or cinema sound.

The ethereal voice of the Daily Briefings was more simply implemented by having the audio attached to a Unity 'object' as the game starts which sources audio from FMOD. The FMOD audio event in this case was a 'multi instrument' containing multiple samples, one of which would be played at random each time the event loops. The loop was created much longer than the samples, so while the event is looping continuously, a lot of the loop is silence and so the affect is that the voice speaks randomly at intervals through the game play. In FMOD, that audio was placed in a group that is also turned down in the mixer snapshot triggered as the player approaches the cinema so that the focus here is entirely on the music video.

Regarding the in game music that changes with the player's score, an inherent issue is that the

triggering event may not happen at an appropriate place for the music to move seamlessly to the next piece. FMOD allows regions of audio to loop if certain parameters (eg game score) are true, such as between a score of 0 and 1. Transition and destination markers can then be used to ensure the music doesn't actually change until a suitable point, such as at the start of a beat or bar. To further increase the musicality, the transition markers can be programmed so the music jumps to a relative point in the next music loop, ie – the music may jump from the end of loop 1 beat 1 to the start of loop 2 beat 2. This would maintain the sense of a 1 or 2 bar loop even during transitions and increase the variation in the music as it moves by triggers.

Similar to many other games and following the book by Robinson, player actions such as jumps, landings, footsteps, laser hits and 'death' sounds were given more variety by programming FMOD to trigger one of a choice of a number of different sounds when activated. For more complex sounds like footsteps, there can be a number of different layers, each with a several options for triggering (ie – the footstep, clothing rustling, clinking of weapon and ammo). Further variety can be added with modulation of pitch shift, which is most useful if the sound isn't a vocal.

Evaluation

Of itself, this project was intended as a creative marketing tool and a learning curve for testing the potential for game design to engage music fans in a different way and judging from the feedback so far, that was successful. The band have been showing the video and game to friends and fans with positive feedback from everyone. While it's wider appeal will have to be tested on release, for close friends and fans of the band, there's enough there for people to relate to the band, the situation and the song. Despite being ridiculous, in that sense it remains 'authentic' for the band, something that Malcolm Garrett again discussed in his interview when creating a branding and persona for artists when marketing.

There are a couple of bugs, sometimes the music drops out altogether when collecting the first shoe, then comes back in again, suddenly. The overlap between the FMOD hosted music and the Unity hosted cinema audio is less than smooth and rhythmically out of sync. For the future it may be worth researching other audio integrations for Unity such as Wwise, Fabric or Elias. It may also be that FMOD is further updated in the future though, bringing this feature and more. Scripting could possibly solve the problem, but I would be inclined to work with a coder\games company in resolving those issues for me rather than aiming to become a coder as well as a producer. In terms of playability, a more experienced coder would be essential to better animate the game characters, this would then increase the scope for more flexibility and more adventurous game design.

The music loops triggered by the game score are quite long, 4 bar loops to make them more identifiable as the single. The transition points were therefore placed at the start of each bar. These points were easier to identify as the single itself was recorded live as a starting point with no metronome. This means the music doesn't move as responsively with the score as it could if transitions were placed each beat. In the future, the music for the game would be better planned before it's recorded rather than use existing music. Or, the loop creation could be treated as a separate production with time stretched\quantized loops so it's easier to place the markers in FMOD by tempo, bar and beat. Alternatively, a retro, 8 bit style version of the single could be produced in addition for the game music which would then give the band more assets to use in other ways for marketing and release.

Feedback and Beta Testing

The band reacted positively from the start. There were suggestions for game play, not necessarily audio related that are beyond my current skills but could be worth exploring in the future. The

crates in the game had been left on a low gravity setting regarding the physics. But I got feedback to say people enjoyed 'Blowing them into the sky for 5 mins', so I left it in. Similarly, transparent walls are constructed around the edge of the terrain to stop a player falling off, though the road forms a ramp which goes over it with the player risking falling into infinity. I left this in also with an on screen instruction on how to quit the game. It adds to the ludicrousness that you can see through the cracks of the game and 'behind the scenes'. I also had this note among band feedback:

'Authoritarian voice saying. Everything is fine. Do not worry. Everything is fine. Please go about your normal daily business. Stay at home. Everything is fine. Protect your humans. If you think. Please don't. Do not worry. Please wash your hands. Everything is fine. Stay at home. Please do not think. Wash your hands. Remain calm. Please Don't think. Stay at home, etc...' (Corbyn, 2020)

This tied into the Daily Briefing idea which became the Boris Emitter object in Unity.

A friend of the band also filmed himself playing the game for the first time. The videos are of him alternately laughing and exclaiming "What's going on? This is insane!"

I think it will be a success with existing fans who know the band and their sense of humour well. Time will tell if anybody else gets it.

Existing Market

In terms of interactive music software, there have been notable releases from both Bjork and Sigur Ros. 'Biophilia' by Bjork was less a game than a multimedia and educational exploration of music, nature and technology. The album Biophilia was released alongside an app that explores musicology concepts connected to the songs of the album. One review of the app in the apple store states

"I think this app is the early 21st century equivalent of the 12" album cover. It brings the audience into the artist's world in a way that music alone doesn't." (anon. 2020)

Echoing the Q&A with Malcolm Garrett, this again points to the potential to engage with music fans in a tangible or interactive form, adding a visual experience to the music, but with the potential to go further with interactive technology. Biophilia went on to spawn a nordic cultural and educational project of the same name (biophiliaeducational.org, 2020)

'Tonandi' by Sigur Ros and Magic Leap does just that. Magic Leap is a form of AR (Augmented Reality) that uses a headset so that the layers of reality appear seamless with the real world. The AR visuals can be interacted with and can respond to the users movement. Sigur Ros explored this concept in Tonandi by creating visuals such as clouds of feathers and balls of electricity in the air along with ambient sound and music. Manipulating the visuals of the AR leads to changes in the soundscape.

With the rise of online, multi player games in virtual worlds, there has also become a trend of concerts being performed virtually in these worlds. They can be organised, promoted and ticketed in the virtual world with a live performance streamed into it for it's delivery. If current restrictions of live music performance aren't able to lift soon, this may well be an arena that is utilised more in the future. Companies like 'Wave' have reportedly made large profits from organising concerts inside online games such as 'Fortnite', making additional money from things such as virtual merchandise. (Techcrunch.com, 2020)

Future Development

Having explored the basics in a simple project, an alternative but more advanced concept was to use FMOD and Unity to create bespoke, low cost interactive AR audio experiences for arts and heritage groups. A wire frame of a specific community space could be created in Unity without need for graphics and textures. Unity Objects relating to actual objects in the physical space could be setup to emit audio which changes as the person moves around the space. Either relating in some way to a heritage artefact or more abstractly as ambient music for an arts project. The experience would have to be relative to the player's movement, so a marker in the physical space could relate to the "player's" start point in the Unity wire frame. It would require use of Unity's XR input protocol so that once the app is started with the player in the correct physical location, the XR controller would 'move' the player within the Unity wireframe relative to their physical movement. As Unity can build an app for iOS and Android, a player could use their own phone and headphones meaning the organisation doesn't need to invest in expensive handsets. Especially if a phone's sensors can be implemented as an XR controller. Once developed, the same techniques could then be applied to games and media surrounding and connecting to a band or artists output.

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Addendum

A44 Game Controls:

W = Move Forward

S = Move Backwards

A = Side step Left

D = Side step Right

Use the mouse to look around and change direction

Hold down Shift to Run

Ctrl (Windows) or Option (Mac) or Left Mouse Button = Fire weapon

Spacebar = Jump

Alt and F4 = Quit Game