

Assignment 1 - Video Game Audio

Sound Design for New Media – DESC9117
Architecture Design and Planning, University of Sydney

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Introduction

Game sound is the last step in game production industries which plays an important role to enhance the sense of immersion or emotional involvement in most recent games. This feeling can be enhanced by adding ambience and interactive music with the correct transitions. Apart from providing sound materials, the role of a sound designer is to create smooth musical transitions for complex interactive events. Nowadays, the trend of game engines that can implement a real time transformation in acoustical and sound parameters has been increased [6,7,12]. Designing nonlinear sounds for video games can be challenging, especially when sound diversity for interactive scenes and characters is viable. This assignment has been scheduled to be complete individually. Although most of the audio materials have been created by author, some of the music and sound effects have been downloaded from online sources. The asset list and time schedule has been printed in appendices A and B.

Design intent and design choices

The aim of this project is designing the sound track for Cube (game) using Wise platform. The game story has been developed around the interaction (fighting) between the player and monsters which occurs in different rooms, corridors and semi-open spaces with different materials and acoustical properties. As it is obvious in other similar video games such as *Alien vs Predator 2 Primal Hunt 2002* [1], 3D and 2D factors for designing sound effects for shooters has been considered in the interactive sound design. The visual objective elements in Cube are demonstrated by a combination of stone age buildings and creatures and modern technology, all of which need special consideration in relation to sound effects. The game contains different maps and in this assignment the sound effects of four maps (map dcp_the_core/enter, map music/wwise 201, map KSP1 and map_met13) and the main game map have been captured in about two minutes of video for demonstrating different gun blasts, sound effects, ambiences and the interactive music. The game has been played silently to understand the potential sound assets in different scenes and levels [9]. As there is no direct contact between the sound designer and game designer in Cube, finding about the characters and events' names is only achievable through logging the remoted game in the Wise profiler and using the reference tutorials [15], [16] which are very helpful for creating a sound asset compatible with the game's objects and events.

The main design intent is creating a realistic acoustical atmosphere in the game's fictional world by implementing interactive sound elements by using the powerful spatial tools of Wise [7]. For enhancing the mood of immersion [8], [12] a specific music has been composed as the main accompaniment and more loop musical elements have been developed and gathered for interactive musical events [16]. According to the data extracted from the Wise profiler, an asset list has been developed for most game actions and events. Accordingly, a great part of hard

effects (SFX), Foley (FOL), voice, ambiences(BG), music and melodies (MX) are created by the author by employing different basic [4] and advanced technical manners.

Voices

In the core of the game map, 12 interactive voice events have been allocated for different entrances while playing the *map_dcp_the_core*. These voices were acted by the author and recorded in a home studio (Mic: RODE NT2000). Later, the raw sound was processed with a Morphoder plugin (VST) in Adobe audition to mimic a mechanic sound.

Sound effects

A great variety of 116 sound effects have been developed and created in this sound design. This category contains a variety of short sounds mimicking the monsters and the player in different actions [7]. All these effects were acted by author and recorded in a home studio. For creating more realism, multiple effects were acted for actions such as grunts and pained noises and different styles of footsteps were acted and recorded on tiles, grass, concrete and dirt for better induction of different spaces in the game [7]. Other sound effects such as gun blast and teleportation effects were modified and/or synthesized in adobe audition. The sound effects of multiple types of explosions and weapons were mostly created through synthesis and modification. For example, the player gun blast effect is a time stretched modification of a water impact effect.

Ambiences

Ambiences have been designed for the *map_dcp_the_core* game through two different methods. Some abstractive and melodic sound effects were combined with the main music which plays a dual role for representing the space. The second method is a more randomized approach by allocating five modified animal sound effects and two highly probable silences (5 seconds) to a Random Container that can be played along the main music event. The subjective evaluation has shown that these methods have been effective for breaking the monotonous atmosphere of the game and changing it to a more realistic ambience.

Music

A mastered stereo music track (2', 22'') has been composed by author for creating a non-diegetic sound for the game play with a narrative mood [3]. Different music tracks have been played by a Roland F-120 digital piano and recorded directly through the sound card (Personus 22VSL) and multitrack recording system (Adobe Audition). The main theme (first track) of the music was inspired by the spaces in the game immerses the player in the game locations [12], [10]. This part consisted of a dark and heavy harmonic sound track which accompanies with the game space as a linear background sound. Other tracks added to the music are instrumental sound effects such as musical vocals and bells that can emotionally involve the player in the game stream [12]. Another sound element that was added to the music is a looped Morse code effect [11] that sounds as a communicative ambient and is repeated throughout the entire music

track. This music has been used as the main music in the *map_dcp_the_core* game and as the Explore theme in the Interactive Music Hierarchy.

Furthermore, 15 music tracks have been created for use as interactive music according to [16]. For enhancing the excitement of game events and the sense of location [12] some free form loops with suitable tempo and scale have been produced by Garageband (Apple application) and recorded using Adobe audition. More melodic loops composed by the author have been used as Death, Story and Boss in the Interactive Music Hierarchy. The music for Combat events have been borrowed from free online resources [13,14]. According to [16] stingers are added to the interactive session. Three tonal charms are played by the piano and defined as announcers for specific events in the game story.

Technical discussion

In terms of an interactive sound design for Cube, Wise engine (2018.1.0.6714) has provided different tools and solutions according to [15,16]. A part of these tools is similar to other regular DAW systems while extra controls are provided for interactive sound implementation in the game. The connection between the game and Wise is addressed by some predefined game calls. In the software platform, Events use the game call names for syncing the proper sound effects to different scenes.

In the discussed game (Cube), the most repeatable events are gun fires and footsteps. For creating maximum realism regarding the weapon effects, sound designers should consider different sequential actions. The Shotgun event has been defined as a delayed play action for Gun-Blast, Pumps (in and out) and shells in the Event Editor. For creating a real-world sound effect, the shell effects have been recorded randomly by thronging a small brass shell on hard and soft floors. The recorded effects were then edited (Adobe audition) into two parts (head and tail) and programmed in a randomized sequence. Enhanced realism and spatialization has been achieved through the pitch randomization and pre-set attenuation curves (Sharesets tab) by distance. As the shells usually expel to the right side of player, more spatialization has been created in the 3D positioning dialogue window by defining the arbitrary paths and adjusting the speaker panning for gun pumps to the right side.

Footsteps were recorded using a shotgun microphone (RODE NTG3) and a portable recorder (Tascam DR-40) on different floor materials for replicating the sound effects according to the Cube game calls for different materials. Four footstep random containers were located inside a switch container that can select the correct effect according to the pre-defined switch calls in the game engine. Footsteps are randomized in term of volume, pitch, and quantized to three different recording for each category. Monsters and the player share the same footstep switches but in the game stream the effects characteristics can be different due to randomization in pitch and volume.

BUS Tracks

The sound effects and music are allocated to proper BUS tracks. Some common effects such as different reverberations and delays are applied indirectly (through the BUS system) that can

reduce the CPU operation capacity. In some occasions the Effects are applied directly to sources (such as Emitter_Teleporter) and rendered through the sound bank. Four reverberation effects (large, medium, small room and corridor) are shared between different SFX (main character, monsters) by creating the proper environmental buses that have been adjusted to Share-Sets mode. In this case the environmental acoustics can change by receiving the triggers and resulting in more realistic acoustics throughout the game story. The parameters of these effects are adjusted to achieve the best compatibility with the game locations. A main attenuation curve (0 ~100m) has been shared between the sound effects that needs to be attenuated by distance such as monster footsteps and their gun blasts. Some state transitions also have been defined to control if player is in water or land and dead or alive.

The interactive music audio files are imported to the Interactive Music hierarchy folders according to the instructions suggested by [16] and accordingly adjusted in timing and tempo to play in different events in the *map music/wwise 201*. The final mastering has been done by inserting proper objects to the mixing desks for applying the final tuning on the sound volumes and filtering. Throughout the sound design memory size has been reduced by using loop music and in some occasions the same SFX has been used for two events with some internal manipulations.

Conclusion

As Cube is a tutorial Game with predefined game calls, understanding the software's applications and the name of game calls are essential and can be accessible through the two provided tutorials [15,16] and game logging (remote connection between the game and Wise). Understanding the functionality of the game engine and how to implement sounds in the software has been a priority for the sound design. The game contains different characters and locations and many actions that has been manifested as an asset list. This list then has been used to recognize the sound effect that was needed for each event. The sound of player and monsters in different positions was acted for creating a natural environment and having an emotional impact on the player. The recorded sounds were then edited and normalized in Adobe Audition and processed in some respects such as level, spectrum and noise. A part of sound effects synthesized in Adobe Audition. These include the effect of grabbing armors by the player and gun pump effects. The music asset was provided by a combination of composition, musical loop generation by Garageband and downloading some allegro musical pieces for interaction in combat situations. All the assets were then revised for any artifact and scheduled for implementing to Wise according to [15,16].

Accordingly, the resulting sound was tested and analyzed subjectively in the game play and corrected in Wise. In different revisions, some of the sound effects were replaced with other ones with higher quality. The key success in this assignment has been a technical and artistic employment of Wise interactive tools for representing the highest amount of spatialization and realism gained with immersive ambiences and music. The sound analysis of some classic video games such as River Ride [2] have been useful for synthesizing some of the hard effects. The game (Cube) with the new audio design has been played in five different maps and recorded by Bandicam. The two-minute final video (DESC9117_Assignment One.mpg) represents the highlights of the game play which have been edited in Vegas Movie Studio Platinum 9.

References

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Media



Picture 1. *Alien Vs Predators* (2002) [1]



Picture 2. *Sound analysis of River Raid* (1982) [2]

Appendix A: Asset list

Game: Cube						
Action	Trigger	Description	File Name	Duration	Author	Numbers
Shotgun Player	player/monster	SFX - blast	Gun_Blast_W	1s	Reza	1
Shotgun pump in	player/monster	SFX - gun's pump in	Shotgun_Pump	70ms	Reza	1
Shotgun pump out	player/monster	SFX - gun's pump out	Shotgun_Pump	130ms	Reza	1
Bullet shell	player	SFX - shell impacts	Shells_Head/Tail_1-6	100-200ms	Reza	12
Rifle	player/monster	SFX - rifle blast	rifle_2	1.2s	[5]	1
Machine gun	player/monster	SFX - automatic gun	Machine+Gun+4	250ms	[5]	1
Weapon Load	internal	SFX - mechanical clicks	WeaponLoad	300ms	[5]	1
Empty weapon	internal	SFX - mechanical click	OutOfAmmo	60ms	[5]	1
Rocket	player/monster	SFX - rocket blast	bazooka+2	1.7s	[5]	1
Fist	player	SFX - fist impact effect	Punch_1-4	130ms	Reza	4
Iceball and Slimball	player/monster	SFX - Soft explosion	Iceball_1-2	1s	Reza	2
Mini explosion	monster	SFX - Soft explosion	Explosion_1-3	1.3s	Reza	2
Big explosions	monster	SFX - Loud explosions	Bomb, Explosion,Grenade	1.5s	[5]	3
Ambience	DCP_Music	SFX - modified animal sounds	A1,A5,A9,A10,A11	3-4s	Reza	5
Teleport	int/teleport	SFX - synthesized signal	Emitter_Teleport	750	Reza	1
Splashing	player/monster	SFX - effect of splash in water	splash_1-2	1s	[5]	2
Grabbing	player	SFX - getting armour- synthesized	Get_armour	750ms	Reza	1
Item	player	SFX - picking an item	Item pick	900ms	Reza	1
Item	internal	SFX - item reappear effect	Item back	1s	Reza	1
Land	Player	SFX - Player landing	Land_01	300ms	Reza	1
Rumble	player	SFX - item pick rattling sound	Rumble	900ms	Reza	1
Grabbing_2	player	SFX - picking an item	Teleport-2	750ms	Reza	1
Player death	state	SFX - acted dying sound	Die1,2	2s	Reza	2
Player Jump	player	SFX - acted jumping effort	Jump_1-4	800ms	Reza	4
Different pain sound	player/monster	SFX - acted pain effect	Pain1-23	0.5-1s	Reza	23
Monster death	monster	SFX - acted death effect	Death1-7	2s	Reza	7
Grunts	monster	SFX - acted grunts	Grunt1-6	2.2s	Reza	6
Footsteos	player/monster	SFX - acted footsteps on 4 materials	Footsteps1-12	500ms	Reza	12
Heart beating	player health	SFX - Heart effect	Heart_1	1s	[5]	1
Map items	DCP_the_core	Short musical items	Samples	4s	Reza	2
Entrance voices	DCP_enter	voice over announcement	enter1-12	4s	Reza	12
Main music	DCP_map	Composed music	Main_Music	140s	Reza	1
Stringers	map music 102	composed short charms	Samples	7s	Reza	3
Boss music	interactive music	loop excitement music	Samples		Reza/[13]	5
Combat music	interactive music	loop excitement music	External music	10s	[13]	5
Death music	player state	composed music	Samples	20s	Reza	1
Victory music	player state	classical music	SMETANA_01	13s	[14]	1
Explor music	interactive music	composed music	Main_Music	140s	Reza	1
Story music	interactive music	classical + compsed music	Samples and SMETANA_02	5-50s	Reza/Online	3

Appendix B: Time Schedule

Task	Time dedicated to task	Date
Works on Wise tutorials [15,16]	15 hours	Week one
Event manifestation	4 hours	Week one
Sound effects acting and recording	5 hours	Week two
Composition of music	5 hours	Week two and three
Searching for and downloading additional sound effects and music components	2 hours	Week three
Sound implementation in Wise	10 hours	Week three
Game play and video recording	3 hours	Week three