

Game Audio

Final Assignment

Joseph Breslin C15713979 DT508/4

Game Overview

The game is a single player shooter in the style of 'Hotline Miami'.

Keyboard Input

To control the player left rotation press "a" or "left arrow".

For player right rotation press "d" or "right arrow".

To move forward press "w" or "up arrow".

To move backward press "s" or "down arrow".

To shoot a projectile press the spacebar (Available when "red orb" is collected)

Objectives

Collect all of the orbs.

Avoid enemy fire and death.

Destroy all the standard enemies.

Destroy the boss.

Try to beat the previous high score.

Orb pick-ups

Health (Pink)

Weapon (Red)

Points (Cyan)

Sound Design & FMOD Development

Music Overview

The music consists of exploration and combat themes and is accompanied by the player and boss motifs. The dominant key for the Music and SFX is A#.

The motif design was done using Ableton's wavetable virtual synth. For the player motif, I chose a preset and played around with it. I eventually settled on a sound that I liked. I used EQ, phaser, and bit crushing to create a unique sound that I thought would work well for an 'exploring protagonist'.

I repeated this process for the boss motif as well but utilized a different preset as the base for the wavetable synth. My desire was for the boss motif to sound abrupt and jarring.

The exploration theme was created using the wavetable synth with heavy delay. The melody is a simple one-note (low octave) played on repeat. The delay fills it out. This track sets a dark mood for the level, it's repetitive and claustrophobic.

The combat theme introduces some rhythmic action to the piece, it layers aggression into the music and breaks the tension of the darker exploration theme. It is a combination of recorded drums in my dad's studio arranged to form an aggressive breakbeat.

The end game stinger is a simple drum roll that naturally goes with combat music.

FMOD Music Implementation

The Music Event in FMOD contains the explore loop, combat loop and another event called motifs. The Motifs Event contains the boss motif loop and player motif loop. There is probability enabled so to add some dynamism to the piece and to prevent the player motif from overpowering the track.

The "Music_State" parameter is then used to step through the music during key in-game events.

- 0 = Explore & Player Motif
- >1 = Combat & Player Motif
- >2 = Combat & Boss Motif

The stinger is played from the ambiance event. The ambiance event has a parameter named location. Once the location is set to 4 the ambiance loop ends and the stinger is played.

SFX

Enemy, boss and player projectiles were created by bending the pitch of a wavetable synth over time. I created a variety of sounds that seemed similar to lasers and retro shooters. I then created events for the enemy and player in FMOD.

The boss projectiles consist of three different sounds. These are to represent the Single shot, sharp shots, and triple shot functions of the boss weapon. I created an event called Boss_Fire which has a parameter called "Weapon_Type". This parameter places the start point of the event at different points along the sequencer.

Enemy and boss damage sounds were created much the same way with more bit-crushing and lower tones. The collection of sounds are shuffled within the FMOD “Boss_Damage” and !Enemy_Damage” Events. This provides variance within each event.

The health, weapon and orb pickups were all designed to provide positive player feedback. The health sound is clean, crystal-like and, melodic. The points orb is the root note A#. The gun is a deeper resonant sound. In FMOD These sounds have their own events.

Enemy death event was created similarly with pitch bending and heavy EQ (LowPass). There are two death sounds that are shuffled on every play.

The restart UI sound is a single press of a keyboard synth. Housed in the “Restart_Game” event.

With many of the above sounds, I am using the ADHSR feature to ensure that nothing gets cut off or sounds abrupt.

Ambiance SFX

There are 4 area types in the game.

	Location(Parameter):
• Outdoors	0
• Room type 1	>1
• Room type 2	>2
• Boss Area	>3

The sounds were recorded around my parent's house and my apartment. I wanted to have an outdoors ambiance when the player is outside the main building. The recording of the outdoors ambiance is just the sound from outside the parent's front door.

Room_01 and Room_02 and Boss room are a collection of recorded fans from a bathroom, underground car-park, and washroom. There is also a detuned washing machine mixed in to the boss room. These have been Low passed and mixed in Ableton.

Each ambient sound has its own event that is then fed into a “Master_Amb” event. These Events are looped but only play relative to the value of “Location”.

Ambiance also contains a snapshot utilizing the “Player_Health” parameter. This is so to add a low pass effect on the master bus when the player has low health. This effects the music, ambiance, and SFX.

Effects and Reverb

I added snapshots to the ambiance room events. This saved creating new events for snapshot implementation.

“Area_Room_01” and “Area_Room_01” snapshots have a short tighter reverb to represent the inside of a building.

The “Area_Room_Boss” snapshot, has a flanger effect and reverb.

The “Area_Outside” snapshot has wide open reverb, to represent the outdoors.

Unity Implementation

Triggers

The StudioEventEmitter is used to trigger every music event in this project. The trigger types used were On Start, On Destroy, On Trigger Enter/Exit, On Collision Enter/Exit and through scripting.

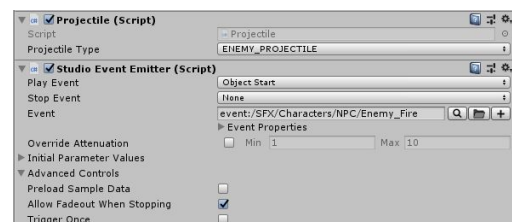
The StudioEventEmitter SetParameter() function was also utilized for making changes to events. Specifically in conjunction with the music:

```
StudioEventEmitter eventEmitter = GetComponent<StudioEventEmitter>();  
eventEmitter.SetParameter(“Music_State”, 2);
```

On Start

Projectile prefabs (assets/prefabs) from enemies, the player, and the boss play immediately when instantiated into the scene. (player>Gun>GunNozzle->Player_Gun.cs) (Enemy_Ai.cs)

The boss projectile prefabs have a parameter named “Weapon_Type. This is set in the inspector. Exploration music is played on start along with the player motif. The ambiance is also played on start from the FMOD_Ambiance gameObject.



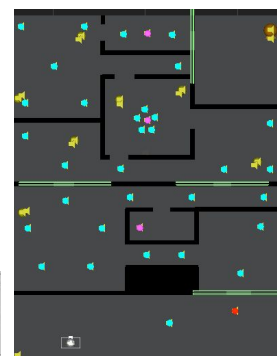
On Destroy

Enemy death is played through the StudioEventEmitter when the boss or enemies are destroyed.

Collisions

Ambient SFX and reverb zones are handled by a StudioEventEmitter and trigger colliders with the StudioParameterTrigger components. The colliders can be seen in the picture to the right. (Green)

The ambiance event is updated by the StudioParameterTriggers. If the player exits a trigger collider with the StudioParameter attached, it will set the “Location” parameter to



the specific value assigned to the trigger.

Orb pickup sounds are also played with the `OnTriggerEnter` function of the `StudioEventEmitter` component.

The “Music_State” parameter is also handled through collision.
Collisions with enemies change the music theme from exploration to combat.
Collisions with the boss add the Boss motif into the music mix.

Scripting Events

The `StudioEventEmitter` can also be played through code.
The standard enemy and boss damage sounds are played on collision with a rigid body non-Kinematic player projectile.
On collision, the projectile component simply checks the tag of the collided object and providing conditions are correct, the `StudioEventEmitter` will play.

```
if(other.transform.tag == targetTag){  
    StudioEventEmitter eventEmitter = other.gameObject.GetComponent<StudioEventEmitter>();  
    eventEmitter.Play();  
}
```

The end game music stinger is handled with `eventEmitter.Play()`; once the end game conditions are met.

The ‘Anykey to restart’ prompt has a sound that is played once any key has been pressed.
This is also handled using `eventEmitter.Play()`;

Conclusion

The music changes required in the brief

A major theme change:	“Exploration to Combat theme”
Stinger:	“End-game stinger”
Character Motif change:	“Player to boss motif”
Audio effect on another music piece :	“Low pass on the master bus based on health”

The SFX changes required in the brief

An environmental audio change:	“Outdoors to Room_01 ambiance”
A player character significant action SFX:	“Player Gun”
An NPC action SFX:	“Enemy Gun”
An effect to one of the previous SFX types:	“Reverb Zones over ambiance”

