COVID-19 Destroyer 2020

Design Document

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**Description**

*Synopsis*

COVID-19 Destroyer 2020 makes use of the test level provided by Unity’s “Creator Kit: FPS” template. The kit establishes a world where a doctor has been miniaturized and sent into the body of a patient to help fight off unwanted germs. The player plays as the doctor, and makes use of their pistol, machine gun, and grenades to eliminate instances of COVID-19 as quickly as possible without harming any of the healthy, nearby blood cells.

*Theme*

The game is set in the many inner organs of a human being. The player has been shrunk to be able to explore the narrow passageways of these bodily systems, and I wanted the environment to feel akin to traversing through a myriad of twisting caverns that would be easy to get lost in. But unlike a normal cave system, the walls of each room are surrounded by the constant droning and churning noises of everyday bodily function (heartbeat, stomach acid, brain zaps). The soundscape feels vast and organic, and almost has a quality of feeling alien with how microscopic the player’s perspective is.

**Creating and Mixing Assets**

*Player*

I had to create a bunch of sounds that were going to be made by the player character in the game. I started with some basic vocalization sounds for when the player exerts himself (i.e. jumping, landing, and throwing grenades). For these sounds, I recorded my own voice making some simple grunts and pitched them down a bit to fit the voice profile I wanted for our doctor character. For each of these events I made use of a multi-instrument that randomly chose between 3-4 sounds per event. That way, every time the player jumps and lands, there is a good chance they will hear a fresh combination of grunts. I was also able to create a slight whoosh sound using a baseball cap. This was added to the grenade-throw event to add extra oomph to the toss.   
 Player footstep sounds were amusing to create and have some interesting programming. By default, the player creates a nice squishy stepping sound created with a boot impact and the wringing out of a washcloth. But the game has a traversable area that is filled with stomach acid. So, I knew that this harsh sound was not going to make sense for that space in the level. I created the Distance\_To\_Acid parameter and programmed the level so that when the player makes contact with acid, (either by walking into or jumping on top of) a wet footstep sound would replace the squishy original. But the acid pool has some depth, so I went further by parameterizing the event to change the footstep sound depending on how deep into the acid pool the player travels. This ranges from small puddle-stepping sounds around the edge, to knee-deep sloshing sounds once near the center. In total I created three tiers of water-depth footstep sounds. Each of these event instruments also has slight random pitch modulation so that the player doesn’t get too tired of hearing the same sounds whether on land or in the juice.

Player weapons in this game feature a lot of fun sounds. The pistol, rifle, and grenade weapons can be selected in game by pressing the ‘1’, ‘2’, and ‘3’ keys, respectively. I wanted the guns to have a combination of futuristic laser and traditional mechanical elements. Shooting the pistol sounds relatively straight forward with a synth laser sound, followed by a mechanical loading of the next round, followed by another synth that confirms that the blaster is ready to fire again. Across each of these weapon attack and reload sounds, I must have used no more than 4 different synth sounds. But I recycled several of the laser sounds I had and incorporated them into other parts of the sounds with the use of pitch automation. This ended up being an efficient way to reuse sounds and create unique parts of the weapon soundscape that felt like they belonged together. One of the coolest events within these weapon sounds was the rifle-long-shot. I had originally planned to create a parameter that would control when this event was supposed to fire, but logistically, it didn’t make as much sense as I had previously believed. However, I was still able to create the effect I wanted, which was to have a droning laser sound that played concurrently with the individual firing sounds of the assault rifle. I was able to modulate the pitch and volume of this event using AHDSR modulation to create a really cool “powering down” effect upon release of the gun’s trigger. This “charging up” laser effect of the rifle really made all the difference and is the reason why the rifle is now my new favorite weapon in the game. The grenades are also really fun (although difficult to control) and the explosion sound was created with the use of a simple kick drum and some vocal, electric, zap sounds that were pitched in all sorts of directions to make them feel less organic.

*Creatures*

I wanted the germs and blood cells in this game to feel more animalistic and alive than their real-life counterparts. It was also important that I somehow convey the allegiance that these organisms had to the player via their sounds. Germs are the “bad guys” and the player is supposed to shoot them, so I used a combination of vocal cries, gargling liquid, and mouth sounds to give the germs a vicious and feral quality. In contrast, I gave the blood cells an angelic quality with a choir “aah” sound that I had lying around. I also made the cries of the cells feel more tragic in hopes that the player would feel bad when shooting them. I drowned all of their hit and death cries in reverb so that even from far down the hall, the player can still hear the impact that they are having by shooting these creatures from a distance.

*Ambience*

Creating a believable ambience was one of the most important parts of the project for me. Naturally, it was not easy to create sounds for a space that nobody has ever been able to visit before. But our culture has created enough stereotypes regarding what our innards could sound like thanks to TV and movies. So, I set to work creating an acid pool ambience with pitched, blubbery, vocals, and other boiling/liquid sounds. I wanted the brain to feel like an engine or a high-powered computer that was processing information. I was able to get a cool effect with the combination of a microwave hum, a rotating dryer drum, and some vocal electric zaps. I wanted the electricity to feel like it was coming from all around the brain, so I added a scatterer instrument to move the sounds around in space and play them randomly on top of one another with adjustments to the spawn interval. The heartbeat is one of my favorite sounds and was created with a kick drum and a trashcan. This sound is so deep and has just the right amount of reverb on it that you can hear it almost everywhere in the level if you listen closely. I felt like this was perfect because I imagine that a human heartbeat sends vibrations that can be heard for great distances in the body. The rhythm for the beat was created with an FMOD loop. I had an idea for a universal ambience that was created and *almost* implemented. In the end, I felt that it was a little bit too much and didn’t really sound as much like a bodily ambience as I wanted it to. I was already very happy with how playing through the level sounded, and I think the ambient elements in the game really help the player understand the world without distracting them too much. When you first load up the level, you can hear all sorts of sounds especially with the reverb of the creature idle sounds coming at you down the hall from the main room. And so, as you move through the body and clean up the enemies, the number of noises that you hear goes down gradually. I really like this subtle effect because it coincides with the objective of the game which is to purify the body and bring it back to a less chaotic, peaceful state.

*UI*

I made the UI category of sounds with pitch automation that I applied to various instances of me tapping on a vase. This is also a good time to mention that opening the UI screen with the ‘ESC’ key activates my ‘Paused’ snapshot that I used to tweak the volume and EQ for the sound effect and ambient group busses in the game. This snapshot carves a space for the UI sounds by ducking the sounds based around the player as they click through the menu. Upon resuming the game, the snapshot is stopped, and normal levels are restored.

*Miscellaneous*

My FMOD organization had a category of miscellaneous sounds that didn’t particularly fit into any other category. But each of these sounds adds a little extra something where it feels necessary and rounds out the experience as a whole. I didn’t do too many things in terms of mixing these elements but let me know if you can hear which one of these events was made in part by an apple being stabbed.

**Mastering**

For mastering I went ahead and tested my sounds to make sure the game could be played at some healthy LUF levels. I ran through the game several times and made use of all the weapons, enemy deaths, and hung out in each room of the game to make sure that max peak never rose past -1dBTP. After altering some of the louder sounds and playing through the game with a balance of walking, sprinting, shooting, grenade throwing, and splashing through the acid pool (in an attempt to create as realistic of a playthrough as I could), I arrived at Live Update and the loudness meter values that I think are pretty healthy for this type of FPS game. Below are my results derived from playing through the level a few times for about 5-10 minutes. I currently can’t find a way to get the max peak above -2dBTP, and integrated levels tend to be between -26 and -21 LUFS depending on how hard you try to make all of the sounds trigger at once.



**Source Audio**

All sounds were created in a closet by me other than maybe a dozen that were synths, kicks, or other random sounds from the standard Ableton sound library. But I’d say probably about 95% were just recorded by me.