Jason Cardella

671 Final Documentation

* Introduction describing the game.
  + My game is a recreation of the classic arcade game "Asteroids". The player controls a spaceship and must navigate through an asteroid field. Players can shoot the asteroids, splitting the larger ones into smaller ones and eventually destroying them entirely. Players have 5 lives and lose a life each time they collide with an asteroid. After losing all their lives the game will end and return the title page. It is meant to be simple and enjoyable, as the classic arcade games were.
* Analysis of the game and its requirements.
  + As I began creating the game, I had to analyze what sounds would possibly be required or make the game better. I was able to think of about 13 types of audio that would be implemented into the game. Sound effects, Ambience, Dialog and UI sounds were the categories that each sound fell under. Looking at the project requirements, I had to further plan how each sound would work within the game. There were only a few sounds that I felt could be parameterized, and decided to use the thruster sound effect and the live counter as sounds to be parameterized. The thruster sound would change with time, and the sound effect for the player being low on lives would become more urgent sounding the lower the live count.
* Discussion of sound assets developed for the game: Describe the sounds made and why those sounds were used (i.e., what role they play in the game). Explain any particular interesting things done to create the sound.
  + Beginning with the FX category, the largest one, the majority of the sounds are meant to be played as oneshots and increase the immersion of the player. I built the sounds around a sci-fi theme, being a space game and all.
    - The first sound I created was the firing sound for the ship. I found a nice source file online, and just adjusted the EQ to raise the higher frequencies and dampen the lower frequencies in order to get more of a "pew" sound.
    - The score gain sound was pretty simple, just a quick trill made using a synthesized sound in reaper. I wanted the sound to be higher pitched, to give off a celebratory or congratulatory sound.
    - The low health sound was created in a similar manner to the score gain sound. From what I've seen, low health sound effects usually mimic a heartbeat that gets faster and more intense the lower the health of the player. I emulated this concept but again using a synthesizer to fit with the genre of an arcade game. I created MIDI tracks with less silence after the notes until there was barely any silence for the one live remaining sound. These sounds were created to be looped, and this gives the impression that the situation is more intense and dire as the player loses more lives.
    - I will group the small and large asteroid sounds together here, since they were both made the same way. I found a source online of rocks breaking, seeing as how an asteroid can be considered a big rock in space. The audio file didn't need much editing which was nice so I just spliced different portions of it up to create a small array of possible sounds. I then added some fading in or out for the tracks.
    - The ship explosion track is one of the tracks that I heavily affected with effects within REAPER. The source file I found was longer than I needed so I spliced it up and layered two clips to create a nice punchy explosion with a small buildup and fadeout. I added some distortion and a small delay to make it fit with the other sounds a bit more.
    - Finally, the ship thruster was one of the more difficult sounds to create well. Finding a good audio source was tricky but I eventually was able to get one to work with. I adjusted the EQ right off the bat, lowering most of the frequencies other than the very low ones. The original sound felt too loud for the higher frequencies, and I wanted a very deep thruster sound so this did the job nicely.
  + Moving to the other sounds, their primary function was to support the immersion of the player and create more interesting sounds outside of the player control.
    - The ambience sounds are used to add a sense of the vastness of space, and are actually real sounds recorded by NASA of things heard from space. They definitely help create the sci-fi theme, and add a creepy element as well.
    - The dialog for the game appears at the start of play to the scene and let the player know they have begun. Along with this, I've created voice over lines when the player reaches three and one live(s) remaining. The game felt a bit empty and repetitive soundwise with only the SFX of the ship and lasers. The voice overs for lives break things up, and also explain why the low health sounds start and change. I wanted to make sure the player fully understood that they were entering dangerous times.
    - The UI sounds are fairly simple, and are meant to just add to the start menu and responsiveness of the buttons.
* Discussion of work done in FMOD. Explain the organization of your project and describe each event in terms of instruments used, parameters exposed to the developer, effects processing used, logic incorporated, and parameters set (i.e., I used randomization of pitch for this event to get a more life-like feel to the sound).
  + In FMOD I organized the files in the same directories as my asset list spreadsheet: Ambience, SFX, UI and VO. As previously mentioned, most of the SFX events are meant to be oneshots. The asteroid break events are created using Multi Instruments, with an equal distribution of each possible instrument to be played. This is to add some diversity to the game, since the player will primarily be focused on destroying the asteroids I didn't want it to sound the exact same way each time. The low health event exposes the lives count to the developer, allowing the sound to respond to the lives left for the player. The Engine/Thruster event exposes the Thrust parameter to the developer, which basically acts as time. The longer the player uses the thrust, the louder the thrust track becomes. The UI and VO events are simply coded into the game itself to play at certain times.
* Discuss work done to address mixing of sounds in your project. Setting levels, parameterizing EQ, introducing compressors, etc.
  + As previously mentioned, I adjusted the EQ for a good amount of the sounds to get them to sound right. The adjusting of levels was mostly done within FMOD and was fairly straightforward, just trying to create a nice even mix of sounds.
* Discuss work done to address mastering. Mention reference games and audio used for level matching and what metering (LUFS) and adjustment work done to polish the game's audio.
  + For my references I used the original Atari version of the game, as well as the Sony Playstation 1 version of Asteroids. This gave me a range of between -26 LUFS and -22 LUFS. Upon first testing my game, I was around -19 LUFS. This is much louder than the other references I found, so I lowered the master bus in FMOD. I recorded gameplay for an average of 2 minutes to get a good sense of the integrated value and put that into reaper to measure. It took a few iterations, but I ended up being able to fall within the -22 to -26 range.
* List all source audio files and references to where they were acquired. This should list the name of the source file, name of original author, and URL to where the file was downloaded from.
  + Laser Gun1.aif by Burkay <https://freesound.org/people/burkay/sounds/130121/>
  + Rock Smash by NeoSpica <https://freesound.org/people/NeoSpica/sounds/512243/>
  + Delta IV Launch by NASA <https://soundcloud.com/nasa/sets/rocket-engine-sounds>
  + Sounds of Saturn by NASA <https://soundcloud.com/nasa/sets/spookyspacesounds>
  + Short small explosion with no tail 1 by ZapSplat <https://www.zapsplat.com/music/short-small-explosion-with-no-tail-1/>
  + UI\_Click.wav by finix473 <https://freesound.org/people/finix473/sounds/546974/>
  + ClickGlass.wav by Divoljud <https://freesound.org/people/Divoljud/sounds/520579/>