My final project was adding audio to my Interactive Media *Asteroids* project. It’s a simple game, so the addition of audio greatly improved the experience of playing it. Being a space-themed game, a lot of the sound was industrial and sci-fi inspired.

The first thing you will notice when running the program is the drone of procedural ambient music. Starting the game, the full, rich synth chords of the music begin to play, fading in and out and switching between each other as you play. The basic UI sounds are constructed from saw and square wave synths. They’re kept simple to avoid being distracting.

The ship has two different thruster sounds: a lighter one for small orientation thrusters when turning, and a deeper one for the large main thrusters. These are tuned down to not be obnoxious. When an asteroid hits you, crunches and creaks alert you to the fact that your life counter has gone down. As your ship takes damage, the thrusters begin to sputter and rattle, and the rattling increases as you lose more lives. Also, when not as full health, soft creaks and clatters can be heard from within the ship to let you know something’s wrong. On your last life, the ship will begin sounding alarms, making sure you know to be cautious. Finally, when it’s time to attack the asteroids, a synthesized, sci-fi laser sound accompanies the projectiles.

The asteroids have two distinct sounds for their two stages. When an asteroid first spawns, it is larger, and when shot, it breaks into two smaller ones. This event has its own rocky, crumbly sound. When destroying the smaller asteroids, a more impactful, collapse-like sound plays. This one is more dramatic than the other to notify the asteroid is gone.

In FMOD, each event was put into groups/banks with sets of sounds that had a similar purpose. This made sure it was easy to find sounds when attaching them to the events in Unity that would emit them. Similar groups were also made in the mixer, since being able to mix them based on what parts of the game they were associated with was useful (ex. Make sure UI and ship events were louder, ambience was quieter). Aside from that, most of the FMOD work was fairly straightforward.

Working in Reaper was tedious at times. I’m personally not a fan of Reaper’s UI, and I always felt like it took a while to find things in menus. Either way, I made sure all the sounds had their own regions and tracks, and each sound could be individually tweaked and exported as needed. The effects in Reaper also made it easy to add character to sounds, especially as I either recorded or synthesized all sounds on my own. I will note, some effects used made it difficult to loop. A few looping sounds had to be rendered into stem tracks and tweaked to be able to get a consistent sound without the effects carrying over or interacting with the break when the loop occurred.

Reaper’s synthesizers aren’t the most in-dept from what I’ve gleaned (though there is likely much more to them than I was able to find). Despite this (or perhaps because of it) they were fitting for small UI sounds. A few simple waves with some chorus, formant manipulation, and some distortion made unobtrusive and fitting sounds for a small space game.

In addition to Reaper and FMOD, I decided to create some ambient sounds in FL Studio since I had a license for it and wanted something with more familiar controls. This was the ambient music. I used one of FL’s more robust synths called Sytrus, which features additive, subtractive, and FM synthesis along with modulations and effects. It allowed me to create some very lush sounds that I layered in chords and a drone to keep players’ ears “occupied” without being overbearing. I’m very happy with how those sounds came out.

When mastering the game itself, the best way I could do so was simply to open FMOD’s mixer and link it with the sounds from Unity and just listen as I played. This was a very by-ear process, and I know I could spend a ton more time on it. Unfortunately, I had to settle for a mix that’s mostly “not terrible” since other projects had to be taken care of and ate away at my time. If I was planning to release this, I would definitely spend a lot more time on the mixing and mastering, and learn more about LUFS and other parameters.

Here is a list and description of all assets used:

* Engine Sputter
  + A crunchy metallic tapping sound that plays when flying while damaged. Also occasionally plays when not at full health as ambiance.
  + Sound sources:
    - Me tapping a bottle cap on a metal tin lid.
* Metal Creaking
  + A scratchy, crinkly metal sound that plays when taking damage and as ambiance at low health
  + Sound sources:
    - Me tapping a bottle cap on a metal lid
    - Me rubbing a bottle cap on a metal lid
    - Me slowly crushing and releasing a chip bag
* Asteroid Split
  + A rocky, slightly echoey crunch that plays when splitting a large asteroid into smaller asteroids
  + Sound sources:
    - Me crinkling a chip bag
* Asteroid Destroy
  + A rocky impact, similar to the Asteroid Split, that plays when destroying the smaller asteroids
  + Sound sources:
    - Me tapping a bottle cap on a metal lid
    - Me crinkling a chip bag
* Fire Projectile
  + A sci-fi laser sound that plays when shooting from the ship
  + Sound sources:
    - A square/pulse wave synth (Reaper)
* Orientation Thrusters
  + A light hiss that plays when turning the ship
  + Sound sources:
    - Me opening a sprite bottle
* Main Thrusters
  + A deeper, hissy roar that plays when moving forward/backward
  + Sound sources:
    - Me opening a sprite bottle
* Ship Damage
  + A creaky, crunchy metal sound similar to the metal creak and engine sputter sounds that plays when an asteroid hits the ship
  + Sound sources:
    - Me tapping a bottle cap on a metal lid
    - Me crunching a chip bag
    - Me rubbing a bottle cap on a metal lid
* Alarms
  + A low, repeating, computerized alarm that plays when the player is on their last life
  + Sound sources:
    - Synthesized square/pulse waves (Reaper)
* Start Game
  + A light, chiptune-like rising jingle that plays when starting the game
  + Sound sources:
    - Synthesized square/pulse/sawtooth waves (Reaper)
* Game Over
  + A chiptune-like (same synth as Start Game) descending arpeggio that plays when the player loses the game
  + Sound sources:
    - Synthesized square/pulse/sawtooth waves (Reaper)
* Generic UI
  + A simple chiptune tone that plays when going from the game over screen to the start screen (Same synth as Start Game)
  + Sound sources:
    - Synthesized square/pulse/sawtooth waves (Reaper)
* Score Milestone
  + Two small ascending chiptune notes that play every time the player reaches a multiple of 100 points
  + Sound sources:
    - Synthesized pulse/triangle waves (Reaper)
* Ambient Drone
  + A long, lush, synthesized tone that plays continuously throughout the game as ambiance
  + Sound sources:
    - FM Synthesizer from FL Studio
* Ambient Chords
  + Long and dense chords that play over the ambient drone when in gameplay
  + Sound sources:
    - FM Synthesizer from FL Studio