

Synth challenge 2021

Introduction :

I had to model 11 instruments (Grand Piano, Distortion Guitar, Bass, Timpani, String Ensemble, Choir, Orchestral Hit, French Horn, Synth Brass, Sax Alto and English Horn) and 15 percussion sounds (Kick, Snare, 2 Low Tom, 2 Mid Tom, closed and open hi hat, triangle and 5 Cymbals).

Instruments :

For most of the instruments I analyzed with the function *analyzer* samples of instruments that I found on the internet. I note the amplitudes of the first harmonics for synthesizing then the source of each instrument by summing several sine, square or sawtooth waves with respective amplitudes according to the analyzed samples.

Then I added an envelope to try to imitate the attack, decay, sustain and release of each instrument.

After that, for most of the cases, I added filters to imitate the equalization. Indeed, it's one of the most important parts for a sound engineer when he mixes a sound. Then I put some low pass filters for instruments like bass and some high pass filters for instruments like string ensemble.

Finally I had for most of the instruments a reverb because I wanted the instruments to sound real and true.

Percussion sounds :

For the percussion sound I used as source mostly a white noise that I shaped with an exponential envelope. For the toms I also added a sweep sine wave to try to be the closest to the real sound of toms. Then as with the previous instruments I added some filters (high pass for the cymbals and low pass for the toms and the kick) and I had a lot of reverb to the cymbal because I wanted them to resonate a lot in the track.