Max Project Brief

If flight has a sound, then what will the sound be like? Will it be just like “boom- boom” sound? In my imagination, it is more complicated, and it sounds more interesting. This project’s name is ‘interactive music plane’, which player use a plane model (or even a drone) to control it. I got this idea from the m5 stick. There are three parameters inside this small machine, roll, pitch, and yaw. These words originally come from plane. My undergraduate university was named ‘aeronautic and astronautic’, and I learned a lot of knowledge about plane in the past. Therefore, I want to make an interactive music work with plane in which people can control the plane and then control the music interactively. What’s more, I want to use this project to convey a thought of music with flying. At last assignment, I wrote in the project brief that I would use a part of that project in assignment2, and this time, I use some parts of the last assignment, but I use a totally different way to control them.

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M5stick

This is the main flow chart of this project. I use m5 stick to control all the parameters in the patch. First, the synthesizer part, I set a lot of parameters here. These parameters are not only used to modulate the timbre, but also play an important role in the overall music rhythm, chords, playing methods, spatial positions, etc. In this part, I use four basic waveforms to synthesize different sounds, sine, saw, square, and triangle. I designed a large mesh structure to allow players to set different amounts of polyphony and different sizes of detune. However, this time I will control these parameters through m5 stick, which I will explain later. On this basis, I designed a very complex block structure to achieve a symmetrical panning of the sound. In a group of polyphony, the detune increases exponentially, and the larger the detune is, the closer the sound image is to the sides, which will make the music sound more three-dimensional.

In this project, my biggest design idea is to use m5 stick’s information to control different parameters and achieve very good sound interaction through the plane model flying in different ways. I use receiver to catch the pitch, yaw, roll and acc of XYZ from m5 stick. Then, I use them to control different parameters in the main patch. I use the pitch to control detune and width. When the pitch gets higher, the detune will be more and the sound will become wider. Then I use roll to control the basic frequency. When the roll become higher, the basic frequency of the sound will be higher. Also, I use yaw to control the four chords written by me. I divide the yaw to 4 zones, with each has a singe chord. So, when the plane is flying, the sound will change the chord from one to another. The basic frequency is influenced by both chord and the roll.

Then, I use accZ and accY to control the proportion of the four oscillators. In the last assignment, the proportion of sine, saw, triangle, and square was set by the listener, which means it was fixed. However, this time I also make these four sounds dynamic. In this way, the sound will change very differently when the plane flies from here to there. When the accZ gets higher, the sine and triangle will become more, and when the accY gets higher, the saw and square will become more. Sine and triangle sound milder while square and saw sound richer. In this way, when the plane flies in different speed in different orientation, the sound will change in an interesting way, from a mild and light sound to a rich sound. I use accX to control the polyphonies as well. When the accX become higher, the polyphonies become more. That means, more sounds will come in, with each has a detune and a different sound situation. Therefore, the sound will be richer.

At last, I use the situation of X to control the LFO of the low pass filter’s cut off frequency. I set an LFO for the cutoff frequency of the filter. However, in the process of my design, I found that the situation parameter changes very fast, causing the sound to change not smooth enough. To solve this problem, I use ggate, zl group, maximum, zl.join and multiple calculation elements to smooth the LFO frequency. Especially, I use pipe to restore the number occurred in the last moment, and I restore the number in this moment. Then I put them together and send them to zl.group and then use $1 and $2 to read the numbers and make a line with these two numbers. In this way, I can make lines from each number to the next one and the LFO will change in a smoother way. This part updated frequency in real time. The bigger the number is, the faster the cutoff frequency of the filter changes.

As I show in the video, I install the m5 stick into a paper plane model. Then I let the plane flies in the air freely, and the sound changes in a very interesting way according to the aircraft flight path. It changes a lot but not just in a random way. For me, I want to use this max project to create a sense of really fly in the air in person.

Overall, this project creatively realizes the interaction between people, plane and music, simulating the changes of plane flying in the sky. It represents my thought about sound interaction with both software and hardware. It doesn't have a lot of rhythm, but more emphasis on the change and interaction of music.

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