

21M.065: Intro to Musical Composition (Keeril Makan), Assignment 9 – Final Project

Originally, after reading “The Future of Music: Credo” by John Cage, I intended to construct a piece that tried to include all, or nearly all, the things he mentioned in his speech, in the order they’re mentioned. I was considering putting in narration of the all-caps words between the sounds. However, I didn’t think that I could include an entire fugue and sonata, recognizably, in addition to everything else (and I wasn’t sure I could construct or pick a fugue or sonata, nor come up with a sound library and compose a quartet for such disparate things as wind and a landslide with it), so I had to come up with a different idea.

After the lesson in class on different kinds of scales, and from reading the bit that talked about Schoenberg’s twelve-tone system, in particular the claim that “new methods will be discovered, bearing a definite relation to ... [the] twelve-tone system,” I came up with the idea of playing with n tone systems for arbitrary (positive integer) n . Since Wikipedia has a lot to say about just intonation, I figured that I probably wouldn’t be able to come up with anything new and interesting based on small integer ratios. Since I have a computer at my disposal, and don’t need to write something that people can play, it was therefore natural for me to play around with equal tempered n tone systems, based on the n^{th} roots of 2. (I played around with the n^{th} roots of 3 and 5 for a bit, but they didn’t give me anything particularly nicer than the n^{th} roots of 2.) What I did isn’t “free from a fundamental tone”, and I didn’t play much with the overtone structure of tones (I just used pure tones). I started out with scales starting at standard A (440 Hz), and going up an octave by ratios of $\sqrt[n]{2}$ for $n = 1, 2, 3, \dots, 12$. I then replayed some of the scales two notes at a time (one note was two semitones ($\sqrt[4]{2}$ times) above the other), and then three notes at a time (one note was two semitones ($\sqrt[4]{2}$ times) above another, which was again two semitones ($\sqrt[8]{2}$ times) above the third). I then had Mathematica randomly generate notes in each of these scales about each of the notes in the scale (so it still sounds like it’s approximately going up and then down), and overlapped four of these tracks to make it sound slightly richer.

The other part of the speech that intrigued me was when Cage said “[t]wo hundred and eighty circles per second on a sound track will produce one sound, whereas a portrait of Beethoven repeated fifty times per second on a sound track will have not only a different pitch but a different sound quality.” I tried to figure out what Cage meant by “a portrait of Beethoven”. I got a gray-scale image of Beethoven from google and had Mathematica treat each pixel value as an amplitude and play them linearly; that sounded a bit like a helicopter. I couldn’t think of much to do with that, so I didn’t end up including it. I thought maybe that “portrait” was a synonym for “piece”, and so tried playing “Für Elise” fifty times a second. When I did this in midi, it sounded like someone

banging on all the keys of a piano, and when I did this in audacity, it was pitch-shifted to beyond my ability to hear (or my computer's ability to play), and audacity was incapable of pitch shifting it back. So all of "Für Elise" at fifty times a second wouldn't work. The sound in my piece, played after a tone of 280 Hz, is the first eight (or so) measures of "Für Elise" played fifty times every second for a few seconds.

To make this connect with the first part of my piece, where I was playing with n tone scales, I alternated between playing "Für Elise" (either all of it or some of it) at slower and slower rates¹ and playing the first eight measures of "Für Elise" in increasingly many tones. First, I subsample it to two tones per octave, then to three tones per octave, all the way up to six or seven or eight tones, and then I skip to eleven tones in the octave right before part of the piece is played at double speed.

So I ended up reacting to a very small part of Cage's speech, one that was not necessarily indicative of the overall character of his speech; though I constructed a piece that could not be played without the aid of a computer, all of it was still based on tones, rather than Cage's concept of "all sound" music.

¹After playing the first eight measures at fifty times a second, I play all of "Für Elise" in a second, repeated for a few seconds, then at 64 \times , then 32 \times , and so on, down to playing at standard speed at the very end.