For this project I decided early on that I wanted to explore multichannel composition as well as re-synthesis. After some experimentation, exploring re-synthesis and spatialization I decided to create several short etudes each experimenting with a different aspect of either re-synthesis or spatialization in reference to composition. This gives me the opportunity to explore themes surrounding the composition of recognisable sounds and how multi-channel configurations can be used to explore and expose the makeup of these sounds.

Once I had decided on a compositional piece, I started using the program Spear to decompose sounds starting with a piano note sample. I then used pro-tools to arrange and spatialize this sound, having some success with this. Fairly quickly into my experimentation with using the partials I realised that I would need to time-stretch them, I tried various methods for this including "Paul Stretch" but found that time-stretching them in Ableton worked fairly well, though all the methods I tried caused significant distortions to the sounds. The majority of the pieces are created using sine generators, for these I took the partials from SPEAR and found their pitch, I then simply created a MIDI note and matched the pitch using a sine generator in Ableton. This approach allowed me to be far more creative with the partials as I didn't have to warp them and could play with things like volume, envelope and effects far easier. This method of re-creating the partials rather than simply recording them seems to be the best way of creating convincing compositions and is how Jonathan Harvey created "Mortuos Plango, Vivos Voco"

Originally my idea for this module was to create an interactive installation where participants would speak into a microphone and hear their voice de-constructed and spatialized. The original purpose here is to attempt to display the voice as its simplest elements, exploring something which is seen as solid and concrete and subverting this assumption through deconstruction and spatialization. I experimented with this idea and had some success but

found it hard to localise the partials in space. As well as this the human voice doesn't occupy a large enough frequency range for the piece to be particularly interesting. My original Pure Data patch simply recorded a short clip of audio, ran it through a re-synthesis object and allowed me to send the different partials to separate outputs with the view of being able to control these outputs "on the fly". While the patch worked the result wasn't particularly interesting and I eventually decided to move away from the interactive element of the project, so the patch wasn't necessary. Despite not using it in the final piece this patch allowed me to explore re-synthesis and multichannel audio in a novel way, allowing me to understand both concepts better as it gave me extreme control over both. This tool will likely be useful in future projects.

The main themes of both the final compositions and my original installation attempt, follow my interests in the alteration of audio through set processes. My original installation piece could have been defined as a piece of process or generative music, with the participants "building" the auditory landscape with the partials of their voices. This is in some ways similar to pieces like "I Am Sitting in A Room" By Alvin Lucier' which also uses the human voice as the instigator for a musical process. The core concept of generative or process music is also seen in pieces such as "pendulum music" and "it's Gona Rain" by Steve Reich. While my original intention was to create a generative installation piece using the participation of other people, the final compositions I created are more similar to a "static" piece like "Mortuos Plango, Vivos Voco" by Jonathan Harvey in concept and execution. In his article "Mortuos Plango, Vivos Voco': A Realization at IRCAM" Harvey writes about how he created the piece and some of his thought processes while doing so, when writing about the technicalities of the pieces' composition Harvey describes how "The spectrum of the bell was analysed with the fast Fourier transform (FFT) program at IRCAM[...]I first synthesised the bell spectrum[...]Then, using Music V (IRCAM) I could give the partials any envelope I chose, for instance I could turn the bell inside out by making the low partials, which normally

decay slowly, decay quickly." (Harvey1981)This method of analysing a sounds spectrum, re-synthesizing it and then using the newly synthetic partials as the basis for composition is largely the method I settled on for my own compositions. While the specific programs used are of course different the core idea of using partials as a compositional tool is the same. The conclusion of this article matches my opinions on the process fairly well, Harvey states that "The computer's ability to read a recorded concrete file, to analyse it, to isolate the minutest fragment, and then to reproduce it rapidly in all sorts of patterns and multiplications (mixed or unmixed with synthetic material) comprises its most intriguing potential" This essentially sums up some of my own intentions with the work I created, taking a recognisable sound and breaking it down into its component parts was the original intention of my installation idea as well as the final compositions. Harvey's use of the word "concrete" harkens back to Pierre Schaeffer's' "musique concrète" This is appropriate in my opinion as if Schaeffer's intention with musique concrète was to record and create "sound objects" to compose with, then Harvey's intention with Mortuos Plango, Vivos Voco could be described as dismantling these sound objects into their simplest components and using these components to re-create and transform the original sounds. This idea of taking seemingly "concrete" sounds and dismantling them is the core idea behind my work throughout this module. The basic techniques of both musics are somewhat similar as well, cutting, splicing and experimenting with envelopes are things that play a vital role in both compositions and in some ways Mortuos Plango, Vivos Voco could be described as a "collage" created from partials.

When it comes to how both my own compositions and (to a certain extent) pieces like "Mortuos Plango, Vivos Voco" sound there are definitely parallels to drone and ambient music. For example, Work by Le Monte Young such as "Pre-Tortoise Dream Music" and "The Second Dream of the High-Tension Line Stepdown Transformer" are (at least aesthetically) similar with the majority of the piece being composed of long drawn-out tones.

Throughout the creation of the pieces, I and others noted how many of the sounds created were gong-like or in some instances reminiscent of woodwind instruments. This sonic ambiguity is something that I find fascinating, simply removing a sounds partial from the context of its envelope for example can have interesting and unexpected results and I intend to use this realisation in future projects.

Throughout this project I have struggled with both time management and developing my ideas. I think that this mostly stems from the fact that I had to significantly diverge from my original idea which left me less time than I would like to both develop a new project as well as complete it before the deadline. Due to this I found it hard to bring the work into focus until later in the module. Despite this the change in direction meant that I have learnt new skills and researched interesting new methods of composition. I feel I have created some interesting experimental compositions and learnt a significant amount about both re-synthesis and the use of multichannel systems, these are both topics that interest me and I am considering for future projects. Potential improvements to the compositions mainly revolve around using more complex techniques to analyse and re-create the partials, using a dedicated piece of software to both analyse and export the partials would have been more efficient than the methods I used. I also would have liked to explore the possibility of using more than eight partials in my compositions as this could have led to more complex and interesting pieces. Composition is something that I am still quite new to, however the limitations imposed by this proved to be helpful, I found myself using simple techniques to create "sound object" like phrases rather than focusing on traditional compositional factors such as melody, harmony etc. This I found to be novel and freeing.

In summary, while I found it difficult to establish ideas and produce a clear plan at the beginning of the module, leaving me less time to produce material, I feel that my work has been a useful learning exercise as well as being convincing experimental compositions. I now understand both topics I intended to explore better and am excited to use knowledge gained throughout this project in my future work both when it comes to specific techniques such as setting up a piece for multichannel systems as well as more general ideas such as how sounds are made up when it comes to re-synthesis and how this can be used as a compositional tool in itself.

Bibliography

Harvey, Jonathan. ""Mortuos Plango, Vivos Voco": A Realization at IRCAM." *Computer Music Journal*, vol. 5, no. 4, 1981, pp. 22–24, https://doi.org/10.2307/3679502.

Lucier, Alvin . *I Am Sitting in a Room*. 1969, www.youtube.com/watch?v=fAxHlLK3Oyk. Accessed 12 June 2024.

Young, La Monte . *The Second Dream of the High-Tension Line Stepdown Transformer*. 1991, www.youtube.com/watch?v=7UmBTr-Kx-g. Accessed 13 June 2024.

Young, Le Monte . *Pre-Tortoise Dream Music*. 1964, www.youtube.com/watch?v=4t1Sl_gYHuw&t=55s. Accessed 13 June 2024.

"La Monte Young | MoMA." *The Museum of Modern Art*, www.moma.org/artists/6520.

Miller, M. H. "The Man Who Brian Eno Called "the Daddy of Us All."" *The New York Times*, 22 July 2020, www.nytimes.com/2020/07/22/t-magazine/la-monte-young.html.

"Mortuos Plango, Vivos Voco | Faber Music." *Www.fabermusic.com*, www.fabermusic.com/music/mortuos-plango-vivos-voco-1154.

List of Software Used

Ableton (2021) Ableton Live 11 (version 2021) [Computer Program]

Avid Technology Pro Tools Ultimate [Computer Program]

Michael Klingbeil. Spear (Version 0.7.3 r.140) [Computer Program]