

MA Commercial Music Producer

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ALESSANDRO FRIGE

Student Number

2024502

Tileyard Education / UWTSD, London

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RESEARCH

The second term assessment for the MA in Commercial Music Producer offered at Tileyard Education entices the creation of a musical instrument taking into consideration the inputs from the “creative music technology week” offered during the term, in which students are introduced to creative and innovative music production concepts as well as opportunities, such as, working with samples using Ableton Sampler, Max and Max for Live, coding (Processing), game technologies and game audio using FMOD and UNITY.

We have chosen to research and develop a sample instrument at this stage of the learning development. We also aspire to create a synthesiser (MAX and MAX for Live) as well as develop games using UNITY engine and FMOD (audio for game), but that will be in the soon future. I have developed Arcade games in the recent past and it is indeed an area of interest for me as a music producer.

The outcome of this project was to develop skills to perceive interesting sounds, harness them using contemporary production techniques and produce a melodic sample instrument. Alessandro Frige, Afrige hereafter, is a vocalist with major in vocals and we have always been mesmerised by how the human voice can be harnessed and used as a musical instrument. We are amazed with the unique matrix of texture, colours, and dynamics of individual singers’ voices alone and when combined with other voices, as in choirs or lead singer and backing vocals settings. This was our inspiration to create an instrument that appreciated this versatility and beauty of the human voice, it inspired us to create our very own choir sample instrument, which we have named “AFRIGE BOYS CHOIR” Sample Instrument. In this project we are using Afrige’s own vocals and the vocals of a 12-year-old and 10-year-old vocalists.

The process has been a huge learning curve as we did not have a vast experience with software development or sound design prior to the Commercial Music Producer program at Tileyard Education. Also, we had not a formal training in production before, so this written report is not only the result of our ongoing research in contemporary music production, but it is indeed a learning tool and reference document for our future production endeavours. In some sections of this report, we have deliberately detailed procedures and methodology for the reasons mentioned above and not with a mere intention of trying to “teach” our examiners what they already know so well. The opportunity to write this report led us not only to engage in meaningful and in-depth research to acquire the necessary knowledge to achieve the project outcome, but also led us to further develop our entrepreneurship skills. The first phase of our enterprise was to brush up our knowledge about sample instruments and gather qualitative knowledge about the functionality and scope of Kontakt technologies when compared with other samplers.

We are very familiar with Ableton Live and the sampling plugin that comes with it called “Sampler.” We know that creating an instrument using Ableton Live Sampler would limit the use of the instrument to Ableton and narrow the commercial viability of our product in an

already competitive market. For that reason, we have decided to design, build, and deliver “AFRIGE BOYS CHOIR” using “Kontakt” technology instead.

Kontakt Sample Instrument

Kontakt Player is a standalone engine/VST plug-in that plays sample instruments and allows for the design and making of sample instrument which are then compatible with all DAW’s. This cross compatibility with all DAW’s has elected Kontakt as one of the technologies of choice for Native Instruments’ music software designers and engineers, for instance.

Kontakt was not a new technology for us as producers and users of Kontakt instruments. However, the software design and development features of the engine were a complete alien concept. We have always been mesmerized by the efficiency and capabilities of Kontakt instruments and how user friendly they can be. Now the opportunity to design and develop our own instrument using this technology was very exciting indeed. we have researched the instrument design aspects of Kontakt thoroughly and gained valuable knowledge about sample instruments, which combined with our previous knowledge as producers on the importance and techniques involved in recording, manipulating audio signals, and harnessing high quality audio samples, gave us great confidence to design and develop a project such as this one.

During my research, test drive and reviews, however, we found out that the “Kontakt Full version,” used to create sample instruments to be played on the popular “Kontakt Play,” is actually a very expensive software not covered by our current Native Instruments subscription. We had to resort to resources we already had to complete and deliver the project, which in this case is the already mentioned “Ableton Live Sampler.” Although this was not our original plan, we cannot deny that the experience was very valid adding even more to our experience with Ableton Live and the market involving its products, which is incredibly dynamic.

We have aimed to describe the process of creating my Instrument in this written report in chronological order, from the recording the samples to the editing, mapping into Kontakt, later into Ableton Live Sampler, and designing the custom graphics for our instrument, in this order. Below is the step-by-step process we investigated and followed in the creation of our sample instrument intended for Kontakt play but delivered on Ableton Live Sampler.

RECORDING SAMPLES:

There are some key concepts when it comes to working with samples: Notes or Phrases (vocals), Headroom, Audio Levelling, Round Robins, Velocity Layers and Samples, naturally.

The Human Element

Performance is the most important aspect of music making. Before being stage and vocally trained I, Afrige, had a quite naïve idea about how important the human element, as in mind set and general health, plays a fundamental role on the outcome of a studio session as it does on stage. The success of a studio session is in fact bound to these two important aspects of performance if quality is to be aimed for (Meadows, 2019).

Working with children in the studio made all these concepts even clearer as children do tend to engage and produce only, and only while they are having fun and the whole experience is still exciting for them. Apart from that, we noticed that a great deal of motivation and honest complements from our end were necessary to keep the flow. As a professional singer, I, Afrige, understand how the vocals folds need to be rested, lubricated (hydrated), and properly supported by specific muscles, which may not be the case for every singer that enters the studio for a singing session. We had to be careful in dealing with the children working with us as to get the most for their unique vocals and yet not to overwhelm them with the technicalities involved in professional singing. Being a qualified classroom teacher, I, Afrige, was very aware that our time management during the recording session should be focused on the children. Tiredness, asking to many times do repeat or do the same thing or even lack of incentive and pep talk can literally put a child in a “frozen” state, and it can be very challenging to help them to move passed that mind-set, which in our case that could mean the end of the studio session. We were careful enough not to take too long to capture their vocal performance, made sure they were rested fed, hydrated, and had a very friendly, honest, and encouraging approach before, during and after the recording session – as we might need them again! You never know (Shelton and Brownhill, 2008).

Miking Technique, Headroom & Audio Levelling

Recording high quality sounds is at the heart of working with samples, so, depending on what sound you are creating for the instrument, a variety of Miking Techniques must apply, especially if the natural ambience is important. I will not extend myself in this topic right now, but the inquisitive reader may want to explore the details of this technique in the works of (Swindali, 2019) and (Owsinski, 2017). We have, however, applied the Stereo AB and Close microphone miking techniques to record the sounds of my instrument, on Pro Tools DAW.

While recording, it is fundamental to take into consideration how much signal the well positioned microphones are picking up from the instruments being recorded. To ensure it is done correctly, the Headroom technique was applied: In 24-bit recordings “the signal peak must be between -6db and -10db or even lower” leaving a “headroom” between -12 and 0db” (Owsinski, p.103). The “Headroom” technique combined with “Miking” Techniques, ensured the recording of an interesting sound texture and well-balanced audio samples.

As soon as the samples were recorded to high quality standards, they needed to be levelled up by using the “Audio Levelling Technique,” in which the volume of the recorded notes or phrases were smoothed out to follow the contextualised dynamic, as opposed to conflicting with the overall energy of the intended sound (Owsinski, p.103), (Yates, 2021).

Round Robins

Round Robins, when it comes to sampling, means to record the same note, or phrase a few times, say, four or five, so when it is transferred to the sample instrument it “does not sound like a gun repeating the very same sound over and over,” which can sound very mechanical (Christian Henson Music, 2021). Round Robins is a technique used in sampling to prevent this mechanically identical repetition of one note or phrase. In our project, however, given the nature of the instrument, a choir, layering technique was employed, in which 10 samples per note/phrase were recorded to be played at once, varying in texture, colour, and dynamics. Two velocities were applied to incorporate Round Robins technique in a way that depending on the performance of the keyboard player the notes will be harder or softer. In future improved versions of the instrument, we aim to include more Round Robins elements in the sample library to enhance even more the vibrance and uniqueness of our instrument (Christian Henson Music, 2021), (Yates, 2021).

The Recording Process & Velocity layers

For this project, we have recorded the notes and phrases following a whole tone heptatonic scale (seven notes) and then recording again but a semitone higher to cover the entire chromatic scale when the two were combined. We chose this approach simply because it is harder for singers, especially children, to sing up the chromatic scale than it is for them to sing up the tonal scale. Ludic Audio sometimes chooses to stretch the range a half tone up or down on his strings sample instrument to create and transpose the missing/sharp note to cover the entire chromatic scale (Ludic Audio, 2021). Depending on the instrument however, Ludic recommends recording every note or phrase from the chromatic scale as the more originally recorded, the more natural and less artificial the sample instrument will sound (Ludic Audio, 2021).

EDITING SAMPLES

Editing the samples to build up the library that will be used by the sample instrument can be challenging and time consuming. However, it is worth it. There are also some key concepts to master when it comes to editing samples: Noise Reduction (Cleaning Up), Pitch Correction, Compression, De-Esser, Pop/Plosives and Gain Stage, to say the least and depending on what sound the samples refer to (David Hilowitz Music, 2021).

Noise Reduction (Cleaning Up)

The samples needed to go through a noise reduction process first using a noise reduction effect on Reaper. This was done bringing the sample volume up and listening to it in an area that plays noise only. Using a Reaper plugin, the noise was removed completely from the

sample as follows: > click FX > Cockos > ReaFir > Edit mode: Precise mode > FFT Size: 1024 > Mode: Subtract > click Automatically build noise profile > Playback a section with the noise and watch as it builds the profile > Turn off Automatically noise build noise profile > Command + click and move the waves on the graphic to have more or less of the noise cancellation effect (Gioia, 2021).

It was important to eliminate the spaces between notes/phrases (vocals) as in the following sequence: > Select the audio track + hit "D" to open "Dynamic Split." > Turn off all transients > Turn on when gate opens + when gate closes + remove silent areas. > Adjust the threshold. > Make sure fade pad is on and adjust leading pad + trailing pad to 50ms (fade in/out) > click Split. > Tweak manually obvious unwanted parts + clean up a bit more or trim out what was cut too soon from the sample tail + adjust transients if needed. > Heal (consolidate) unnecessary splits. > Split the already split samples further to eliminate plosives (vocals) and other unwanted performance noises: > Preferences > media item defaults. > Turn on Create automatic fade-in/out for new items, length, and change settings to 0:00.050ms + click ok. > Zoom in + hit "S" to split + hold on "Shift" and modify the region by moving the split selected area or moving the cross fader (Gioia, 2021).

Pitch Correction

The recorded large audio files, (before they were chopped up into individual audio samples) were processed on Melodyne to correct pitch inaccuracies and level up the audio volume as Melodyne has this additional feature that can save considerable production time. Once the file was processed it was rendered as a new audio file (Ludic Audio, 2021), (David Hilowitz Music, 2021).

Making Samples Sound Better with Band Compression

The next step was to make the samples sound better. It was achieved by adding some effects as in the instruction: Compressor to separate the frequencies: > FX > All plugins + filter Splitter > 3-Band Splitter (to divide the sound into three separate bands) > Crossover 1 = 120 + Crossover 2 = 4.5KHz > click Pin connector (2 in 2/6 out) + add 3-4 and 5-6 channels by clicking "+" > To hear the mid and high newly added channels: All plugins + filter Joiner > VST 3-band joiner > Pin connector (Now the three bands can be heard together). Now that the bands are separate, each frequency can be compressed separately: > All plugins + Cockos > VST ReaComp > Place the compressor between Band Splitter and Band Joiner > Pin connector + turn off Aux L/R to work on the low frequency band only > Solo 3 Band Joiner from the side menu bar > turn mid and high bands down > Solo ReaComp + adjust threshold + ratio = 4.0 – 1, fast attack = 3.0ms, medium release = 100ms (or accordingly) > Solo Band Joiner + bring other bands back to hear everything together > Add another ReaComp to work on the high band: All plugins + Cockos > VST ReaComp > Place the compressor between Band Splitter and Band Joiner > Pin connector + change pins to be just 5-6 in and 5-6 out > turn the mid and low bands down > Solo ReaComp + adjust threshold + ratio = 4.0 – 1, fast attack = 3.0ms,

medium release = 100ms (or accordingly) > Solo Band Joiner + bring other bands back to hear everything together > Add a compressor to all bands: All plugins + Cockos > VST ReaComp > Place the compressor after all current effects > Adjust the threshold accordingly > Add a limiter: All plugins > filter Limiter > JS Event Horizon Limiter/Clipper > Ceiling = -0.3, threshold -3 or accordingly (Gioia, 2021).

De-Essing Vocals (Accentuated high frequencies)

De-Essing is all about controlling the high frequencies of vocal sounds such as “s,” “ch” and “th” sounds depending on how they are pronounced. Two approaches were considered, as described:

Automatic: Compressor + side-chain EQ to only react to high frequency content – can be useful for quick editing or lots of backing vocals for instance: > ReEQ > Highhigh/Emphasize the high frequencies: Enable on > Type: High Pass > Roll off the low end by cutting everything below 1.5KHz or accordingly > Type: Band > Boost the Frequency parameter to about 5KHz and gain to about 11.0, which is where the “s” sounds are more obvious, by triggering them with this EQ into a compressor will cause the “s” sounds to be compressed > ReComp > Solo ReaEQ + click Pin Connector + add two more channels 3 and 4 channels for the side-chains (1 and 2 = the actual vocal, 3 and 4 = sidechain) + listen then > change output from 1 and 2 to 3 and 4 + listen > Solo ReaComp + change Detector input: Auxiliary input L+R [to hear the filter, hit Preview Filter] > Ratio = 4.0:1, fast attack = 0.1ms, fast release = 0 > Bring threshold down to compress the S’s accordingly but not too much at risk of the vocal sounding whispery (note that the compressor only compresses the S’s > Fx chains ? > Save all Fx as chain + Name it.

Manually: Can be time consuming but worth investing as lead vocals are usually where issues can be more clearly heard: > Envelopes > Volume (Pre-Fx) > Create points in the volume line when the S’s are and bring the volume down accordingly, or just draw the volume change by holding down Command + draw accordingly. Add an EQ if the overall sound gets too dark. This process can be very precise and more accurate than doing it automatically. For the purpose of this project, the vocal considered to play a more leading role was de-essed following the “manual” approach (Gioia, 2021).

Removing Plosives (Accentuated low frequencies)

Plosives or Pops, (P’s” and “B’s or even T’s) are a real problem on vocals as they interfere with the smoothness of the rest of the equalization by accentuating the low frequencies in those sounds. The only remedy to fix that is to remove them and the sequence below was followed on Reaper to clean up our choir vocals: > ReaEQ > Delet all bands except for 1 and switch it to “High Pass Filter” which roll off the low end > Bring the bandwidth up a bit > Find the frequency that will fix the problem (climbing from low to high until the accentuated low frequencies disappear, around 150Hz. The problem was that the EQ was filtering the entire track making it sound thinner than before, so, to avoid it, an automation of this EQ on the plosive sounds only was applied as follows: > Solo ReaEQ + Touch the fader on the Frequency

parameter > click Param > Show track envelope > Reduce the Plosive sounds on the track envelope by creating four points + bringing down the outside areas, deactivating the EQ on all other areas that are not part of the Plosive sound.

To avoid having to do it manually in every plosive sound, an automation item was created: > Hold Option + draw a straight line from the beginning to end of the graphic + select + right click + save + name it "Low cut" + save. To retrieve: > Right click + Load + Choose the item just saved > to adjust the size: Hold Option + stretch the sides. Likewise, to adjust the amount of all automations, stretching the top line instead was an option but to change and isolated, double click and de-select "baseline/amplitude affects pooled copies" could be done. Alternatively, right click + remove from the pool (Gioia, 2021).

Slicing the Audio File into "Individual Audio Samples," Setting up Region Markers and Sample Loop Points (REAPER)

The last step in the editing phase was to bring the large audio file/s into a preferred DAW and slice it into "individual Audio Samples." Any DAW could be used for this process. However, "Reaper" can be particularly more efficient for this process given its advanced features and user-friendly aspect for working with samples (David Hilowitz Music, 2021).

Using Reaper, we needed to find the transient of the audio files by clicking on "Tab." This action would split the audio file into individual notes or phrase samples and the following actions applied: > Select all and cut the end of the tale of the audio samples a little bit to facilitate the manipulation of the audio samples. > Fade out the audio samples.

Region Maker: "Region Markers" is a very nice and efficient feature on Reaper. It facilitates the sampling editing process as it gets the samples properly labelled, ready to be transferred to the sample library which will be used to build up the instrument. The regions made with Region Maker will be used to edit the "Looping Points" on the individual sample files: > Action > Show Action List > type Insert Region > Markers insert separated regions for each selected item > click "Run." Next, > View > Region manager > Name the audios accordingly in an orderly fashion.

Looping Points: Editing looping points on the individual samples is a very important skill to have working with samples. We chopped a nice part of the beginning of each sample, copied and pasted at the end of the sample and crossfaded while in "grid mode" into the sample until perfectly linked. After two loop points were placed on the sample in the very same point of the beginning of the sample and the graffitied cut and pasted section, making a perfect loop. After that, the "Region" box was adjusted according to the loop points. Then the following action applied: > View > Region Render Matrix. > Select the desired region and click "Render." This process is extremely important and efficient as it gets the samples ready not only to be used in any sampler but also to be sold out as a samples pack in any sample library such as Splice, Roqstar, ADRS and others (David Hilowitz Music, 2021), (Gioia, 2021).

MAPPING SAMPLES

Mapping refers to placing the edited samples into a sampler which will create the sampling instrument. In this project, I have used “Ableton Live Sampler” but there are other samplers also used for this purpose such as the already mentioned Kontakt and Logic Sampler (Ludic Audio, 2021).

Mapping the Samples into Kontakt and Ableton Live Sampler

Kontakt: > Drag the lowest note from the sample library into the empty Kontakt file. This will start up the instrument. > Go to Map Editor > Close the range of the note to one note > Place it on the correct pitch on the Kontakt keyboard as it says on the file name. > Drag all the other sample files from the library into Kontakt > Place each on their correct note on the Kontakt keyboard as it says on the file name. > Highlight all notes (if they are the Tone Scale only) and drag the range a half tone down. Kontakt will play the extra range a half lower. (For greater precision, instead of a Whole Tone scale (Heptatonic Scale), use a Chromatic Scale instead). Create and group and duplicate it until you have four groups. > Selected groups only. > Drag notes 1 to group one, etc. (Ludic Audio, 2021), (David Hilowitz Music, 2021).

Ableton: > Ableton is far easier to work with than Kontakt. The layout is also a lot simpler and not as glamorous as it can be on Kontakt. On Sampler, the challenge is knowing the capabilities of the plugin. It is a very well-designed piece of software and user friendly. There are great resources on the Ableton Live website on how to use Sampler for Live and very detailed courses that can be purchased on ADSR website. Our challenge was to be creative as to add EQ, Reverb and other parameter modulating knobs as it involved adding extra plugins onto the instrument as well as mapping them to the Instrument Rack Macros panel. Another challenge was to make the instrument to look a bit cooler on the DAW and we achieved that changing the knobs colour.

CUSTOM GRAPHICS

Overview of a Choir Instrument Design

David Das specializes in Choir samples instruments and gives great insights on what the main features of a Choir Sample instrument should be. In the grid below are some of these key features:

Vocal Harmonies	Mic Position
Vocal Layers	EQ – Low / Mid / High
Vowels: AH EH IH OH (Phrases)	Volume
Modes: Legato / Polyphonic / Sequencer	Reverb

Designed knobs and a cover for the instrument not only makes it more interesting and user-friendly but also can have a decisive factor commercially as it adds value. Given the custom

graphics limitations on “Ableton Live Sampler” there was very little we could do in this department apart from adding a bit of extra colour. Design wise, we focused on EQ, Compression and Reverb user customisable controls as the main features. In the future improved versions of the instrument, we plan to include more features as suggested by Das (David Das, 2021), (David Hilowitz Music, 2021).

DISCUSSION

(The Project & Inspiration)

The idea for my instrument derived firstly from my desire to create an instrument that I could effectively use in my own productions, be excited about it and have it as one of my brand’s recognisable signature sounds. Secondly, I have realised how expensive similar instruments available online can be, such as “Voxos Epic Choir,” “Aurora Choir,” “Abbey Road Drummer Collection” or Action Strikes Percussion Sounds” from Native Instruments, which can cost hundreds of pounds (19 Sampled Choirs Compared, 2021), (Native Instruments - Software and Hardware for Music Production And Djing, 2021).

Being able to produce samples of high quality and use them to create an unique, friendly user, affordable and yet efficient instrument can be a game change for any producer. This insight inspires me to be a “sound scavenger” anywhere I am, especially when travelling to a different place or a foreign country in which we all get marvelled with the cultural variety and all the beautiful and unexpected sounds which inevitably come with it. In the case of this project, we explored the texture, colour, and dynamics of the unique voices of three different singers, who could be any singer anywhere in the world!

We believe that this kind of freedom, when a music producer can harness unique, unusual, or rare sounds anytime, anywhere is the holy grail of contemporary music production. It takes our mind straight away to the work of incredible producer-artists such as Finneas Baird O’Connell, Billie Eilish’s brother. In an interview to the teen magazine, seventeen.com, he revealed that he “uses different sounds to help him stand out as a music producer. In “Bury A Friend” you can hear Billie Eilish getting her teeth drilled at a dentist appointment in which she recorded the sound and it ended up in their song. In “Bad Guy” there is an Australian stoplight sound. Finneas says the stoplights in Melbourne make a sound that he loves. It even stays on beat so of course it ended up in a Billie Eilish song. “To me, as a producer, I always want something to set stuff apart,” says Finneas. According to Seventeen, he “travels with a recorder and if he hears something he finds interesting, he’ll record it and find some use for it”” (Williams, 2021). Apparently so does Billie, following the footprints of her successful music producer brother.

Like Finneas and Eilish, anyone can record interesting sounds on their mobile devices nowadays. It is, however, the production applied to those sounds that set them apart, and here is when the work of a good and creative producer shows off its magic. Processing the newly discovered raw sound can result in an even more interesting sound. Now, transforming this interesting new sound into an instrument that other producers all over the world will be

able to have access to is the ultimate innovation. This is the idea that laid the foundation for my project – the “AFRIGE BOYS CHOIR” sample instrument, which hopefully will be the first straight line of the blueprint for many other projects of the kind.

FEEDBACK

(Instrument Functionality and application)

The “AFRIGE BOY’S CHOIR” Sample Instrument, is intended to be used in productions that require an atmospheric choir feeling. It’s advanced features such as Reverb, Attack, Release and Decay make it possible for the instrument to be employed in a variety of ways. Also, the velocity feature allows for purposeful modulation in dynamics, which is great for live performance.

The ready instrument was tested by other producer colleagues who gave very useful feedback such as additional control knobs to modulate LFO’s. An extension of the number of samples in the library and addition of a “soloist” mode for melody line purposes were also suggested. A sample track of the instrument was shared with non-producer listeners, and it was feedbacked that the sound produced by the “AFRIGE BOYS’ CHOIR” sample instrument has a spiritual, soul uplifting and nostalgic quality that makes the instrument an asset also for film and television productions.

In the future improved versions of the instrument, as mentioned above and in response to feedback, we intend to include more samples in the sample library as opposed to starch the sampler region to make up for missing notes, add extra velocity to increase dynamic variation and a “Soloist” mode. A “Phrases” mode, as pointed out on feedback, would make the instrument more appealing, increasing its commercial value.

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