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Development

Element 2b Instrument Essay

This has been done using a combination of a bell type synth sound that comes with Sonic Pi along with another synth named the Hoover. Components such as the attack and the delay of the sound have been modified to change the qualities of the sound. This essay will discuss the approach that was taken when creating this synth sounds. The factors that influenced my decisions will also be discussed within this essay. The instrument I have created is a synth that I have developed using the app Sonic Pi by Sam Aaron. essay. I will critically assess the whole creation process noting issues I faced as I began creating and what I would do differently upon reflection and under different circumstances. I will also take a brief look into the history of non-conventional musical instruments and earlier instruments that have been created. The instrument will then be compared to other instruments that exist within society today. The similarities and differences will be highlighted.

As mentioned above the instrument was developed within a coding software called Sonic Pi. Coding within the live music industry has been in place since the 1970s. "The phenomenon of live coded music stretches back to the demo-scenes of the 1970s to 1990s, where graphics and music demo programs were shared. This exchange caused the emergence of a public art form where the graphics and music were created real-time on live programming environments." (Partners 2016) This shows how far back evidence of coding within live music has been in operation.

The text goes on to say that "As the new-fangled type of musical expression, live coding music is gaining traction and creating a foundation for greater things that may well be the missing link between composition and improvisation." (Partners 2016) To me this means that in a way a new set of musicians or creators have been birthed to work and create music in a new way that has not been done before as opposed to the traditional ways of composing or improvising.

"While live coding have blurred the borders among an instrument builder, a composer and a performer, we are in favor of transplanting the outcome of live coding from speakers and screen to an instrument performer" (Grimes 2011) This quote again just goes to show how coding broke boundaries of traditional composers and musicians etc and now a wider group of people can create their own music.

"Live coding environments are designed for fast exploration of musical patterns. Platforms such as Tidal and Livecoding.tv host a strong movement of video-based live coders and online communities that offer support and help with problems. Livecoding.tv is inclusive and accessible to everyone. There are no restrictions on the musical genre." (Partners 2016) This again just buttresses the point that a new wave of music and musicians has come about where the creator is free to create and experiment which will eventually result in a development in the type of music we hear. There are no restrictions with coding meaning the possibilities for creation are endless.

The synth I have created was made through a coding software called Sonic Pi. There are a few default sounds already within Sonic Pi which I had planned to go through to select one and then further develop. However, two of these sounds, the bell and hoover sound, were significant to me and stood out from the rest completely. The bell synth sound stood out to me I believe because of my background in gospel music. You get use of a lot of bells or chime like synths which add a specific feel to the music. I feel that the hoover synth just appealed to me due to crunch and texture of the

sound. This led my thought process into a state of curiosity as I began to wonder about the sound that would be produced by merging the two together.

Using this software seemed to be the most practical approach, personally, to creating the software as the software firstly is free to download given me no issues of costs. This heavily influenced my decision to begin using Sonic Pi over apps such as MaxMSP or Native Instrument's Reaktor. Sonic Pi is a live coding software created by Sam Aaron. The software was designed for use in schools to teach students coding within live music. However, the software has been designed in a way that will be suitable for use by professional musicians in professional scenarios. The fact that it has been designed this way means that it is simple to get in to and beginning creating quickly but also to a good standard.

Sam Aaron at a talk goes on to explain how to use Sonic Pi. "The way to get started with sonic pi is that you just write the word play And chose a number" (Aaron 2018) Just by this simple line of coding you are able to generate sound from Sonic Pi so you immediately become more intrigued and comfortable with the software. This factor also helped me shape my decision to use Sonic Pi over any other software. He then goes on to say "This is important for schools because in schools the teachers have no time at all and that is before they have even got the management sorted out and got the kids to be quiet right? So all that stuff happens and when they've got the kids quiet they have to say their sentence which is going to excite all the children to code It needs to be something which is interesting and engaging and so having the word play and the number 60 you can immediately make some results... one simple line of code can provide some results which are meaningful to them." (Aaron 2018)

A brief history on coding within music. Coding began being used for performance basis strongly in the 1990s. "Emerging from the club scene at the end of the 1990s, a number of prominent Live Coding performers soon organised themselves into an international consortium "for the proliferation of live audio programming": TOPLAP [6, 2]. However, traces of Live Coding can be found far earlier." (Lee 2013)

The text then goes on to say "At the end of the 1990s, software art (and its sub-category code art) [10] evolved from net.art. Exploring the beauty of algorithms, this movement dealt with code as a new form of expression[13]. With the ever-growing power of computers, interpreted languages (or rather: their interpreters) had by now become fast enough to be used to generate audio and even video in real-time. In 2000, the duo SLUB (Alex McLean and Adrian Ward) did their first Live Coding performance (including projection of source code), utilising a self-written environment hacked together in languages like Perl and REALbasic. At about the same time, Julian Rohrerhuber did first experiments with Live Coding in SuperCollider. Since then an increasing number of people have expressed themselves by the means of source code on stage, which eventually lead to the founding of an organisation dedicated to Live Coding, TOPLAP[2]. While at the beginning Live Coding was confined to the abuse of general purpose languages (Perl) and the extension of existing computer music frameworks (SuperCollider), soon the development of integrated environments dedicated solely to the Live Coding of sound and multimedia (Chuck, impromptu; see Section 5) started." (Lee 2013) This shows how coding within music and for use during performances began to become popularised. Computers started becoming more powerful with the advancements of technology to the point where sound could be generated.

How does the instrument work? The instrument is made up of a mixture of a synth called "hoover" and a bell type synth called "dull bell". The synth is played through a midi device of some sort and is really good as both a cinematic sound effect as well as an instrument that could play a solo melody

or chords. Due to the different characteristics of the two foundational sounds, the synth has a tone suitable for a wide range of musical uses. Modifications have been made to the synths such as the change in its envelopes. For example, the attack on the dull bell synth is set to number 2. This simply refers to the time the synth sound takes to kick in. This subtle change helps the two sounds to blend together more and allows for the hoover synth sound to act as a tail for the dull bell synth sound.

In comparison to existing commercial instruments, I believe there are blatant similarities and differences between the synth I have created and commercial instruments that already exist. Along with that, there are also pros and cons to using one over the other. Firstly, traditional commercial instruments and this synth both make a use of the diatonic scale. The usual 12 pitches are used for the synth. This is a fundamental similarity and ensures the synth can be used both in conventional and non-conventional manners. However, there are some significant differences between this synth and commercial instruments of nowadays. The uniqueness of the sound means the synth can be applied to a wide variety of different genres of music and can play several different roles based on what it is needed for. It can be used as a solo instrument and can be compared to that of a synth string instrument such as a viola. On the other hand, it can be used as an effect rather than a musical instrument. The synth has very cinematic qualities which is why it would be perfect for effects to go with a piece of music for film for example. This is an evident characteristic of the theremin also as it is used in concerts for solo performances on the other hand it has been in several film productions. "Virtuoso performances by theremin masters like Clara Rockmore and Lucie Rosen ensured a loyal cult following for the instrument..... the theremin has enjoyed a storied history, especially in film. Here are just a few programs that have featured Léon Theremin's unique invention [source: Theremin.info]: "The Green Hornet Radio Show" (1936): "The Green Hornet!" began the broadcast, followed by a hornet-like hum from a theremin. "He hunts the biggest of all game ... " "The Lost Weekend" (1945): The theremin provides an eerie undertone as protagonist Don Birnam's alcoholic cravings threaten to get the best of him. "The Day the Earth Stood Still" (1951): Haunting and otherworldly, the theremin's whine underscores the overall creepiness of this 1950s sci-fi movie. Though the theremin is most often associated with the eerie tones of space and sci-fi flicks, it has also been featured in shows like "The Flintstones" and "Batman," as well as in horror films like 2004's "Hellboy." (Kretowicz 2017) Here we see the versatility of the theremin as it has evidently been used for solo performances but also has been used in film. Not only has it been used in film but the text shows that the instrument features in different genres of film. This is significant because different genres of film require different styles of music. The fact that the instrument can be featured in multiple genres of film gives the instrument more positive business implications as doors open for the buying of the instrument. Music for film is becoming more significant. An instrument like this synth would therefore do very well business wise as this is a market that is growing rapidly. The demand for music in film is growing constantly.

In comparison to commercial instruments such as the piano, guitar etc I feel as though this synth is more versatile in that it fits comfortably within a wider range of genres than commercial instruments. There are some songs or genres where a piano or guitar may just not fit the timbre of the music. I feel as though this would be much less of an issue when using this synth.

Coding is seen as a non-conventional way of making music and there are many other ways to go about doing this in a non-conventional manner. Many instruments have been made in the past which can be described as non-conventional or non-commercial instruments. Early non-conventional instrumental inventions include instruments such as the theremin. This was an instrument created by a Russian physicist named Lev Sergeyevich Termen. He was also referred to as Leon Theremin in western society.

“In the early 1920s, physicist Léon Theremin was doing research on proximity sensors for the Russian government. He was trying to develop something like a land-based sonar device using an electromagnetic field to detect objects that entered a certain zone. Instead, Theremin came up with a musical instrument: his namesake, the theremin. He demonstrated his creation to Russian leader Vladimir Lenin, who was said to have "adored" the new instrument [source: Beckerman]. Lenin sent Theremin on a world tour to show off the new technology, and Theremin delighted audiences throughout Europe with his "ether-wave" concerts. Theremin eventually found his way to the United States, where he patented the "Thereminvox" in 1928” (Kretowicz 2017)

Here we see how early on, non-conventional musical instruments have been around for. Way before coding becomes a mechanism for making music, people have been creating in ways that may be seen as unusual or uncommon. It can be said that coding further pushed boundaries and expanded the creative process in which we undergo to make music.

As well as using coding to create instruments and synth sounds, it can also be used to create music. From a beat, to a melody and even a bassline. Performances of this are already taking place around the world.

“In the back room of a bar in the South London suburb of New Cross, there’s a revolution happening. Or maybe it’s not so much a revolution as a de-volution, a rolling back to the backend of music production, where the possibilities of the encoded information inside computer software is open and endless. An artist with the simple stage name Joanne, is standing on a stage at the Amersham Arms, looking at her laptop and typing, immersed in dry ice and the creative process, as a projection plays behind her. Red, blue, green, yellow, purple text on a black background moves and changes; highlighted orange, and cut-and-pasted, in a flash, disappearing with the rhythm of a cursor. The music it conjures is bouncing out of several well-placed speakers. It ricochets from the corners of the dimmed room as a repetitive dull thud drops, then builds up through a crunching, incessant rhythm. Some of the audience squeals, the floor vibrating with a heavy beat that’s almost organic. This is the look and sound of live-coded electronic music, or the more recently (and craftily) coined music ‘genre’ now known as Algorave.” (Wand and Cook 2004)

The text then goes on to say that “As an audience member, essentially what you’re doing is looking at a person looking at their computer with a straight face. It’s an unusual sight to behold. The sound that comes out of that is often something, coarse, lo-fi and erratic. Sometimes the beats can be hard for the inexperienced dancer to follow, oscillating between the fast breakbeats comparable to drum ‘n’ bass, other times evoking straight up four-to-the-floor rhythms. There’s real, visceral experimentation going on here, even if it’s typed out through a certain syntax” (Wang and Cook 2004) This shows further evidence to support the idea that we have entered a new way of creating and receiving music. Things are changing. There is a large aspect of experimentalism within coding music which is different from going to a concert by your favourite artist where you know what songs to expect. That uncertainty is something we aren’t used to as music consumers. Also you know the type of energy you are going to receive from an artist you go to watch perform which adds to the value of the show. However, in the case of live coding what you have instead of all that energy is an individual completely focused on their laptop. This shows how coding has changed the way we both make and take in music.

It can be argued that coding has now taken electronic music into a new level. The opportunities and possibilities with the way we interpret music and create it have been further expanded evidently. Already there is a noticeable shift in the way we take in music and make it which is shown in the text above. This shows a blatant milestone in the music industry with its collaboration with coding.

Reflection upon results of instrument? – During this whole process, there were some failures as well as things that happened which I was pleased about. The first failure however was trying to add the bit crusher effect to the sound just to add a bit of a crunch. This proved too difficult to do as the system would continuously bring up an error message. For this reason, I had to scrap that effect causing the result of my instrument to sound a little different from what it would have originally.

Along with this, another failure or obstacle I faced in the process of creating my instrument was not being able to play the midi from sonic pi. Going through the tutorials on Sonic Pi it was difficult to try and connect my Midi keyboard a get sound generate by playing the keys. This is one of the obstacles I faced during this process. I feel as the solution to this issue would simply be more time on Sonic Pi to practice and become more familiar with the software.

To conclude the reasons as to why I have gone about the creation of my instrument on Sonic Pi have been clearly detailed above. First of all, the system of coding just allows for a new method of creation which allows the creative mind to be expanded more than seeing the same blank daw that we have become used to. It can almost be described as refreshing and less daunting not having to see that blank canvas. I believe that for the sake of practicality it makes life easier to develop an instrument through sonic pi because firstly the programme is free to download but also, its quick and fairly simple to get into. Also, the fact that we are coding opens up music to a whole new audience. Now those that code or enjoy coding, are able to comfortably make their own music.

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