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Instrumentality in Electronic Music

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Commentary submitted in partial fulfillment for the degree of
MA by Research, University of Huddersfield

February 2011

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Pepe512.....	4'09
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Rackudesu.....	3'00
Pianwanwan.....	3'09
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Nature of Submission

This submission consists of a portfolio of original compositions supported by a commentary discussing the ideas and techniques explored in the individual pieces. The commentary focuses on ideas surrounding traditional musical performance, particularly with acoustic instruments, which have established normative methods of performance practice as well as more modern techniques such as laptop performance and how the latter draws on, but develops significantly away from the former. For the purposes of this commentary I will define the term non-musician as a person who takes an active interest in art but comes to compose music having not had a formal music education that involves use of western notation. This is in comparison to the traditional view of the virtuoso musician as someone who has spent their life perfecting their performance technique. The commentary also discusses the perceived differences between the physical virtuosity of the instrumentalist and the more static virtuosity of the laptop performer. The term *sentia* is used to by Julio D'Escrivan to describe the research into conserving energy by using the smallest human gesture to perform a task. I use this term particularly with reference to laptop performances.

Abstract

There is nothing intrinsically musical about a laptop computer, but there has in the past two decades been a rise in popularity of using portable computers to perform music. Computers powerful enough to create music were once exclusive to Universities and music studios. Now computers are as accessible to people as traditional instruments and have fully opened the world of electronic music to the non-musician through the use of graphic interfaces.

This commentary will discuss the relationship between instrumentality and the performance and composition of electronic music by examining traditional methods of instrumental performance and the relatively modern idea of performing live with a laptop computer. The issue of imperfection will be discussed and how certain 'errors' have become widely acceptable even to the point where whole genres have arisen entirely from their creation. I will look at the way glitch music began as a genre entirely reliant on the computer for its creation into one that has embraced traditional instrumentation and the idea of performance.

There will be a comparison of the compositional styles of Alva Noto's earlier solo work and his more recent collaborations, in particular with the Ensemble Modern and the formally trained pianist and composer Ryuichi Sakamoto. The aim of this is to examine whether the inclusion of instruments or notions of instrumentality in the compositional process has in some way changed Alva Noto's approach to composing from a visually led (cymatic) process to one that is more

sonically led. This comparison is used as a case study to inform my own work as some works in the portfolio set out deliberately to explore traditional instrumental playing techniques, whereas others deal with virtuosity within the software environment of Ableton Live.

1. Glitch Music and Instrumentality.

Glitch music is the 'sound of the system'¹ - the sound of digital hardware failing, being captured and sequenced by self-taught composers and performed by self-taught performers. This has made for a vast array of different approaches that can all be summed up in Kim Cascone's description of the genre in his article 'The Aesthetics of Failure'. In this article, Cascone writes that, 'the medium is no longer the message; rather, specific tools have become the message.'² While the current in-vogue genre, dubstep, is instantly recognisable by its signature rhythm and bass lines, glitch is not so easily categorisable. Whilst there are certain generic sonic similarities between tracks, glitch is essentially a style governed by process and a method of handling and creating sonic material - CDs being scratched or painted over and rerecorded, image files being opened in sound programs to exploit their raw data or digital clicks drawn sample by sample. Glitch music is not known for its heavy use of effects but for the insides of the machine being laid bare, uncompromising and unapologetic.

Glitch music more than anything benefits from being acousmatic - a sequence of clicks produced by alternating between minimum and maximum values in quick succession and ultra dry production bypassing essential circuitry and being projected directly into the brain. Glitch is literally the sound of the failure of the computer system, edited, organized and transmitted through the speaker. This genre could not be made in any other way - it is the quintessential digital music.

Of particular concern is glitch music's ambiguous role as either a commercial product or an academic pursuit. Glitch music is an offshoot from the more popular electronica movement, separated from commercialism by the extensive influence of art and philosophy on the genre, evident even in the naming of the label Mille Plateaux after Deleuze and Guattari's book³. Although it is clear that glitch is inspired to a degree by dance music, a glitch composer is more likely to cite Luigi Russolo or Steve Reich as an influence due to the emphasis this music places on the patterned repetition of noise based signals.

Herein lies a problem with the reception of glitch music. Most glitch music is performed in a formal setting either within an art gallery or within a university laptop ensemble catering to a musically knowledgeable audience able to understand the process and draw cultural benefit. Yet the repetitive structure and aggressive, percussive timbre of glitch music is reminiscent of popular dance music. It

1 Collis, A. (2008) 'Sounds of the System: the Emancipation of Noise in the Music of Carsten Nicolai' *Organised Sound*, Vol 13(1), p. 31

2 Cascone, K. (2000) 'The Aesthetics of Failure: "Post-Digital" Tendencies in Contemporary Computer Music' *Computer Music Journal*, Vol 24:4, p. 12

3 Deleuze, G. & Guattari, F (1987). *A Thousand Plateaus*. London and New York: Continuum.

is for this reason that the glitch community is rhizomatic in structure, which inherently provides creative freedom but also alienates a popular music audience who are wary of investing time or energy educating themselves about such a complex genre. If even the smallest portion of this larger audience is to be won over, then the responsibility of educating them lies in the hands of the composer, who must work within current accepted modes of reception to educate and eventually subvert currently accepted ideas.

Although glitch music originally eschewed notions of instrumentality more recently a number of glitch artists, in particular Alva Noto have been working with instrumental ensembles, exploring the limits of both instrumental and computer resources. If we can view the laptop as an instrument in such an ensemble then we need to understand the notion of 'instrument':

the limits of an instrument are essential to its being perceived as an instrument at all⁴.

Physical and practical limitations are inherent in traditional instruments. These limitations are often fully recognized by the audience who use these as a means to measure the skill of the performer. With the laptop there are no such limitations. The laptop performer is often situated in a club with limited lighting, while the laptop itself obscures the performer's actions. A further important issue regarding the 'instrument' in digital spheres is the multiplicity of possibilities that arise – particularly when using a laptop. With a traditional instrument there is one set of behavioral characteristics – be they timbral, gestural, monophonic or polyphonic. With the laptop we essentially encounter a device capable of being many instruments and also control these simultaneously. Therefore the conceptual understanding of the laptop as an instrument is complex.

In a traditional sense, instrumentality implies human agency and virtuosity. In the twentieth century hundreds of years of convention regarding playing techniques and how we perceive these physical actions in relation to the music were subverted in electronic music and particularly in acousmatic music - arguably the most confusing of all musics from a performance perspective. In acousmatic music the speaker is the primary means of sound production. The traditional limits of instrumentality are stripped away with virtually any sound now possible. With the computer as the infinitely customisable front end, 'instrument' becomes much more difficult to define.

The piano's limitations are on display for all to see. From a mechanical perspective its basic elements are a set of fixed taut strings, struck by a hammer, whose velocity is controlled by how

4 Croft, J. (2007) 'Theses on Liveness' *Organised Sound*, Vol 12(1), p. 62

hard and fast the piano key is pressed. The strings of a piano are traditionally (up until Henry Cowell and John Cage) not interacted with directly so it is safe to posit that a piano's most limiting factor is its sound design and from this it can be said that a piano will have been designed to sound aesthetically pleasing.

Many people will have played an instrument in their lifetime and will understand the inner workings to a basic level. It is clear then to such an audience watching or listening that the amount of effort required to perform and effort invested by the performer is physically linked to the resulting musical sound. There is a clear dichotomy between the current reception of instrumental performance and the modern laptop performer due to the fact that in the latter there is generally an absence of any sort of spectacle or visual cues.

Spectacle is the guarantor of presence and authenticity, whereas laptop performance represents artifice and absence, the alienation and deferment of presence.³

Glitch music is more mystery than spectacle. It can be performed without much noticeable intervention on the part of the performer with the computer. As a result it can be confusing for an audience as to why it is necessary to have a performer at all. With the inner workings of the performance hidden away on a laptop screen and the physical manifestation of parameter control often cramped on to a portable controller, it can be difficult for the audience to gauge whether the performer is doing much at all.

This dichotomy is further amplified by the fact that the contemporary audience is in a state of distracted reception due an overwhelming influence from current popular culture⁵. Popular music is often accompanied by attention deficit inducing music videos with edit cuts seconds apart and bright visual cues and overly literal visual metaphors flashing to keep the attention for a fleeting moment until the next shot of breast or thigh. All of this has the effect of drawing the audience's attention away from the sonic and the structural and performative aspects of the music. In certain instances the lack of 'performance' is substituted by a dancer who provides the visual and gestural cues more generally provided by an instrumentalist.

A common spectacle used in the performance of glitch music is to have some form of projected video behind the artist usually featuring some form of abstract animation work synchronised to the

⁵ Cascone, K. (2003) 'Grain, Sequence, System: Three Levels of Reception in the Performance of Laptop Music' *Contemporary Music Review*, Vol 22:4, p. 102

music. This can displace the feeling of lost spectacle to a degree and keep the visual attention of the audience but cannot be considered as replacing any sort of gesture intrinsic to a musical instrument.

It is debatable whether gesture adds much to the performance of electronic music. The current techniques of laptop music performance can be compared to the European classical tradition of the eighteenth century⁶ in which the performances were restrained and were more about focusing on creating a perfect rendition of the score than attracting any sort of acclaim as a performer. Musically meaningful gestures are communicated by physical means in both early European classical music and laptop music, however, it was not until the rise of the virtuoso in the 19th century that the role of physical gesture was amplified in order to focus attention on the performer as a ‘celebrity’ (such as Paganini or Liszt) rather than merely a function of playing the music. If the preferred mode of performance is generational as this fact suggests then it is more than plausible that current audiences can be educated to accept different performance techniques in the future.

With the advent of laptops and faster computing in the late 1990s the divide between studio-based work and live performance has become increasingly blurred. The case study discussed later in this commentary centred on Alva Noto exemplifies this move. Alva Noto is clearly not a ‘celebrity’ performer on stage unlike DJs such as Richie Hawtin even though the technology they use is virtually the same. Alva Noto’s deliberately restrained approach is part of a carefully constructed performance aesthetic. Alva Noto’s collaborations with instrumentalists (such as that with the Ensemble Modern on *UTP*) are extensions of his studio-based work. Another artist who has successfully bridged the divide between studio-based work and live performance in a contrasting way is Björk. It is common for Björk to reappropriate her songs for a live setting even going as far as to create different renditions for different tours. This removes the audience’s anxiety that they may just be listening to a backing track with performer’s live vocal and also provides surprise and spectacle. Another interesting technique at Björk’s *Volta* concerts was that the performer’s actions on the tenori-on were broadcast live to a panel for the whole audience to see. This goes some way to relieving the audience of any anxiety they may have that the performer is not directing the sound generation, although without the audience knowing the processes involved it does not do this fully.

What such devices as the tenori-on and Ableton do provide however, is a means to communicate to the audience that the performer is reacting physically to the performance environment in real-time. As the music industry moves from focusing on the sale of physical CDs or virtual downloads to live

6 Jaeger, T. (2003) 'The (Anti-)Laptop Aesthetic' *Contemporary Music Review*, Vol 22:4, p. 53

performance⁷ it is important to understand how contemporary electronic music engages with traditional notions of performance. Does the laptop necessarily engender a new performance practice? Can traditional notions of virtuosity be communicated without the one-to-one mapping of physical gesture to sonic result? The compositions included in this commentary explore both aspects of this: by either focusing entirely on live electronic performance using Ableton Live or through the use of traditional instruments to communicate human presence and gesture.

⁷ From 2008 to 2009 Madonna's 'Sticky & Sweet' tour grossed \$408m whereas the supporting album sold less than 4m copies.

2. Alva Noto: Comparison of Solo and Collaborative Work

Music as much as instrumentality is defined by its limits and it is how far the composer strays from these limits that blurs the line between sonic experimentation and music. When the sound being created is in the hands of a non-musician it is likely that established or widely agreed musical conventions will play a lesser role during the compositional process.

Alva Noto is one of the leading figures in the relatively recent scene of laptop performance. By his own admission he is a non-musician and began his professional career as a landscape architect. Alva Noto has discussed in interviews his preference for not using sequencers in his music but rather to work with the sound in a more visual way⁸. It is no surprise then that Alva Noto's earlier work lends itself well to an installation environment, it is sound to be contemplated and studied. He aims to 'overcome the separation of the sensual perceptions of man'⁹ by presenting his works in nontraditional ways. In his musical work this can be seen as taking a very visually led, cymatic approach to composition, using frequencies beyond human hearing abilities, which can be analysed visually, or by using mathematic patterns to influence or generate compositions. This can be seen clearly in the album *Prototypes* (2000) in which Alva Noto constantly challenges the listener with ultra high frequencies at levels much higher than is comfortable and seemingly endless repetition, with little musical change. The cymatic approach can be best seen on the track 'm10' on the album *Transform* (2001). At 2'42" long the track is seemingly devoid of any musical information aside from a repeating rhythmic sine wave rhythm barely perceptible amongst a more dominant lower frequency sine wave gradually increasing in volume. Yet when the file is opened in a wave editor an elegant curve shape is revealed, no doubt formed by a mathematical process. The level meter never reaches above -3.6dB throughout the track, which is at odds with popular music production, which has demanded louder and louder mastering.

To begin with, Alva Noto's performance tools were analog tone generators, a DAT recorder and a mixer¹⁰. Even by electronic music standards this is an abstract way of working but if it were assessed in the same way the piano was assessed earlier then there are clear limitations that are easily perceivable by the audience and thus this is a very effective electronic instrumental performance setup.

⁸ ns. Alva Noto interview in Big Magazine. Available: <http://thebigupmagazine.com/blog/about/art/alva-noto/>. Last accessed 7th November 2011.

⁹ ns. Alva Noto. Available: <http://www.raster-noton.net/main.php?action=artists&dat=8>. Last accessed 7th November 2011.

¹⁰ Balit, D. (2010). macro-micro-minimalism. Available: <http://www.tate.org.uk/intermediaart/macro-micro-minimalism.shtm>. Last accessed 20th Dec 2010.

There is a stark contrast between an album such as *Prototype* or *Transform* and *Mimikry* (2010). Separating these albums are a number of collaborations with Ryuichi Sakamoto, a pianist and composer who has also spent time in a successful pop band, the Yellow Light Orchestra.

The piano is deeply embedded in classical tonal and early popular music. It was in the music of Stravinsky and Bartok did its percussive side become more emphasized, particularly in works such as Stravinsky's *Les Noces* (1919) and Bartok's *Sonata for two pianos and two percussion* (1937). In the twentieth century it is this focus on rhythm and repetition that has come to dominate. So it is most interesting that Nicolai and Sakamoto decided to combine these two paradigms - the electronic and the classical.

Insen (2005) is the second collaboration between Alva Noto and Ryuichi Sakamoto and marks a turning point in works of Alva Noto. Unlike the previous collaboration between the two, the relationship between the piano and electronics is the main focus of the work and the relationship here in terms of the computer is a subordinate one in which the computer has effectively taken on the limitations of the piano. Rather than just being exploratory pieces, each of the compositions on the album were designed to evoke some sort of emotion surrounding the title, whether it be a time of day or a place¹¹.

Every sound in 'Morning' appears to come from the piano and there are none of the familiar glitch sounds of Alva Noto's previous work. In their place is a simple repeating sample of a piano key cut away from the centre of the waveform to produce a characteristic but subtle click, which features through most of the piece creating a tonal pedal. Where the clicks would usually feel tied to a regular rhythm, these pulse freely devoid of time signature or quantisation. Whilst in previous Alva Noto compositions the clicks would usually contain large amounts of high frequency content, they are filtered in this composition. In this work there is no discernible melody: the piano plays a series of isolated atonal pitches. The piano line gives the impression that Sakamoto is reaching around, exploring the piano carefully looking for a resolution between the two paradigmatic opposites of traditional and modern performance one key at a time. Sakamoto's piano performance is left untreated. The composition contains an absence of high frequencies and mid range frequencies are kept to acceptable levels while the bass, providing a heavy corporeal element, is mixed high as is common in Alva Noto's work.

11 ns. (2005). alva noto + ryuichi sakamoto. insen. Available: http://www.raster-noton.net/download/rn-65_insen/insen_pr_info.pdf. Last accessed 28th Dec 2010.

The culmination of all this instrumental experimentation has led to Alva Noto's latest collaboration with the vocalist Blixa Bargeld. The project began as a series of live improvised concerts with an emphasis on improvisation and resulted in the album *Mimikry*, in which Alva Noto continues to engage with an increasingly more traditional musical aesthetic focusing on popular music structures and tonality as opposed to the more minimal noise based structures of his earlier work such as *Prototypes*. Alva Noto has switched from a process or mathematically driven compositional style to creating teleological works with a clear pop structure.

'Once Again' is the title of the second track on this album and features the voice of Blixa Bargeld. The use of vocals is almost omnipresent throughout popular music regardless of genre and the voice more than any instrument within the pop canon comes with the most cultural expectations. This is due to the voice's strong link with the refrain. 'Once Again' follows these expectations by using a slightly modified version of a pop song structure, chorus/verse/chorus/verse/chorus/middle-eight/breakdown/chorus repeat. Opening a song with a chorus is a common pop music technique and clearly demonstrates Alva Noto's increasing engagement with popular modes of composition rather than the more esoteric glitch music he wrote at the start of his career. Alva Noto acknowledges his use of melody as being 'more memorable'¹².

Certain popular music vocal conventions are used in the choruses where the melody takes the form of a repeated refrain, which follows the popular music method of building an anthemic or memorable hook. The intervals of this melody feature very minimal movements of mostly one tone and numerous words are sung over one note. There is not much other musical information within the melody - it is deliberately simple and most of the transformation takes place digitally. The verses make use of predominantly spoken or almost whispered words, that nevertheless have an aggressive quality only possible with close mic'ing.

It is evident from my research that certain instruments are inextricably bound by their physical limitations and also to cultural expectations on behalf of the audience - a pianist will be expected to perform to a certain level before being accepted by a knowledgeable audience just as vocals in popular music carry associations with pop music structure and small tonal movements.

When thinking about the ontology of instruments it would be unwise to try to think of a checklist of points which an instrument has to include to be genuinely considered an instrument, but it is also

¹² Balit, D. (2010). *macro-micro-minimalism*. Available: <http://www.tate.org.uk/intermediaart/macro-micro-minimalism.shtm>. Last accessed 20th Dec 2010.

important to remember that musical instruments have up until the 20th century been designed with a certain aesthetic appreciation of what constitutes 'music' and how this is communicated via physical actions. It seems strange to abandon this idea completely so I feel that the most successful way of integrating performance into electronic music would be to take into consideration accepted modes of performance.

Alva Noto's work has seen a definite influence from his work with instruments in that he has switched the focus of his music from rhythm to tonality, a reversal of what happened with early 20th century popular music and at odds with his beginnings as a dance music influenced performer. This suggests to me that Alva Noto has come to respect not just established musical conventions in composition but seeks to explore these conventions within the new form of digital composition. Later works have taken into consideration that high or mid range frequencies can be uncomfortable to listen to and these have been mixed accordingly. The frequency range that Alva Noto currently uses in much of his recent work has become bounded by more traditional instrumental ranges. There is also a clear structure throughout Alva Noto's later works in contrast to earlier works.

3. Composition Portfolio

As a composer with no formal traditional music education every composition I have created has in some way involved technology and I regard the sequencer and the computer as my instrument. The sequencer in question, 'Music,' was for the Sony Playstation, a commercial games console with a 33mhz processor, 2Mb of RAM and a maximum of 1MB available storage. The Playstation did have a rudimentary audio effects chip offering simple reverbs. The program offered a maximum of 24 tracks. This restrictive environment led to a number of creative techniques to conserve resources such as using samples milliseconds long, looping these samples to create tones and making use of all the available piano roll of 8 octaves plus a maximum 12 note pitch bend to expand the timbre of a sound as much as possible before resorting to using more resources. From working on such a limited machine I have become accustomed to working in quite a restricted environment, and when comparing this to working with an instrument which has its own bounded set of musical possibilities, there are certain parallels and a creative way of working to extract the most interesting music. Due to these techniques I take very little concern in the choice of samples I use to begin with (because the samples are so small), and because of this I would say my music relies far more heavily on process. The process has such a significant impact that some of my compositions are created almost fully from just one click sample milliseconds in length. This process is similar to that employed by Alva Noto – the teasing out of the smallest sonic clicks and noises to form larger structures. However, where our practice differs is that thus far, Alva Noto has only made use of electronic and more recently instrumental source materials, whereas I am open to using all types of sound as they contain a wealth of spectral information that give each work a character.

There is a definite exploratory process when choosing new samples and it is not so much the initial sound I am interested in, as the aliasing or glitch it produces when looped. This glitch can then be harnessed in a compositional way to create something interesting.

The concept of my project was gradually to integrate traditional instruments and both instrumental and live-electronic performance into the process of composition to see what, if any, effect it had on the compositional process. It was perhaps naïve on my part to think that I would become a competent performer of the piano in just over a year, but this has only served to highlight the divide between the start up cost in terms of effort, of learning to perform with a traditional instrument and Ableton Live – a software designed with its ease of use in mind that uniquely among current digital audio workstations allows the triggering of pre-made audio clips, therefore removing the left-to-right timeline basis for composition prevalent in such software as ProTools, Logic Pro and Digital

Performer. Further into the project as I became more competent performing with Ableton Live. As a result, I decided to focus more on the idea of the laptop as an instrument.

Within the larger community of glitch artists, the concept of the laptop is widely accepted. Christian Fennesz was the first such artist in the 1990s to consider his work on guitar and laptop as equal instruments. On his album *Field Recordings 1995-2002*¹³ four of the tracks are called 'Instrument' demonstrating his engagement with the laptop as an instrument. Further evidence can be cited in the review of Fennesz's collaboration with Sakamoto on *Cendre*¹⁴,

For the purposes of *Cendre*, both artists used laptops as an instrument, while Sakamoto contributed piano, and Fennesz his requisite guitar.¹⁵

What has become more apparent as I listen to more and more glitch music and follow Facebook or Soundcloud groups more closely is that there seems to be a limited number of composers promoting their work solely within their own community. Glitch artists seem to be only listening to other glitch artists, promoting their work on these internet groups to other glitch artists they have added as friends simply to link to their portfolio. I feel it is necessary to look outside the established glitch community for inspiration to avoid the genre turning into self-parody, just as Fennesz has moved toward more pop-based oceanic glitch and Alva Noto toward the inclusion of more traditional instrumental sonorities.

Towards the later stages of my project there is a distinct switch towards music that is more commercially viable and this was done as a conscious response to what I saw as, not so much a commercialisation of Alva Noto's work with Blixa Bargeld but more an attempt to reach out to the listener that usually would not contemplate listening to glitch music. An attempt to communicate in a musical style that is at once familiar but also provides something new.

In integrating instrumentality (both through traditional instruments and in live-electronic performance) into my works I have chosen a limiting factor for each composition. This is due to my view that it is limitations in the design of an instrument that create the most successful performing environments.

¹³ Fennesz, C. (2002) *Field Recordings 1995 – 2002*, Touch

¹⁴ Fennesz, C. (2007) *Cendre*, Touch

¹⁵ Dunton, C. review for *Brainwashed* (USA) Available:

http://www.touchmusic.org.uk/catalogue/tone_32_fennesz_sakamoto_cendr.html . Last accessed 7th November 2011

Sine Scales

I composed this at the start of the project and it features only one sound source. I wanted the limiting factor to be that the piece was entirely humanly composed and avoided any unnecessary sound design work or performance. The predominant influence in taking this approach was the work of Frank Bretschneider. The sine wave is the simplest sound source available and aside from reverb and EQ to indicate space there are no processes or effects. The delay effects at the end of the composition are programmed manually. The speed changes are used as a tool to reveal the imperfect notes in the scales, which are only audible at a certain tempo. This technique was used to show that one of the main compositional processes in the microsound genre is to repeat notes or samples of only a few milliseconds length at high speeds to create timbre through composition. I used a number of repeated (imperfect) scales to bring attention to the fact that to perform on an instrument takes years of repeating the same performances over and over to achieve something close to perfection yet with a computer this can be made compositionally interesting in a much shorter period of time.

Harmonic Guitar

This composition was designed as an emulation of a live guitar performance, typical of artists such as Christian Fennesz and Christopher Willets, which when recorded and looped could be added to. This could have been done by using Max/MSP to record a mix of the original performance in the background and playing it afterwards, with the added notes. The opening phrase involves only one note at a time and this is added to on further repetitions. One of the problems of this composition was the large amount of background noise from the samples. I believe this problem arose from the number of individual quietly recorded samples used to sequence with. If the notes are recorded discretely then there is an inevitable amount of background noise recorded with each note whereas a complete performance includes this only once and is easier to deal with. I intended to create a companion piece to this of a live performance but abandoned the guitar and took up piano instead. Originally, I did not want to include the noise and crackle in the composition as I thought it was very typical of something I would do usually and wanted to try something new. I included a Linear Predictive Coding (LPC) version of the whole composition as a single audio track, which reduced it to a simple sine wave resonance of the original. This can be heard on its own towards the end as the guitar fades out. Another concept behind this composition was the use of repetition. Repetitive chanting has been used by Buddhist monks in Tibet to induce a state of meditation and I was inspired by the idea that music can have such an effect on people. I included a binaural sine wave mixed very low in the composition that pulsates between either ear when listened to on headphones.

The difference in frequency between the two sine waves results in a binaural beat being created at this frequency difference which can result in alpha waves being generated in the brain, potentially aiding mental state¹⁶.

Piano

This composition was intended as a composite of sampled performance elements and sequenced composition. Most of the melodic content of this composition was from individual piano keys I had sampled. The repeated rhythmic melodic line is sequenced rigidly and complimented by the high pitched melody which was a sample of a small 3 note performance treated in Soundhack with phase-vocoder and imported. In the middle of the composition the piano melody takes over the focus for the first time and the glitch elements are reduced from being percussive to an accompaniment. This was to provide a contrast by including a traditional performative element.

The kick rhythm is composed from a number of short clicks layered on top of each other and depending on how exact the quantisation is affects the timbre of the sound. I used this to my advantage to create timbral variation from bar to bar to mimic how an instrumental note will never sound exactly the same. At the end of the composition the piano swells and distorts over the glitch sounds to assert its importance in the piece. Composing parts of this piece for piano reinforced for me the inextricable link between tonality and the refrain, for creating memorable melodies.

Ominousness

I composed this piece by performing on a bass guitar directly plugged into a soundcard that I then recorded and cut into samples. An interesting benefit of using an instrument is the ability to modify the timbre very easily and intuitively. I aimed to communicate this by using extended performance techniques to create this composition solely from the bass guitar. The melody is a simple bass pluck which I have sampled and sequenced four octaves higher. The bowed timbre was created by bowing the bass guitar with a cello bow. At the end of the piece the track appears to be effected by a gate, but this is in fact a manual effect that I have created by automating the master volume. In the same way that a good performer is always in control of their instrument, using unconventional techniques to subvert the sequencer in ways like this displays similar personal control of the computer.

Pepe512

¹⁶ Lane, J. D., S. J. Kasian, J. E. Owens & G. R. Marsh. (1998) 'Binaural Auditory Beats Affect Vigilance Performance and Mood' *Physiology and Behaviour*, Vol 63, p. 249

Around the time of this composition and the following one, I had begun looking into less traditional methods of performance and decided to investigate the performance opportunities of Ableton Live. This composition was an exploration into the sound of the glitch offshoot, clicks and cuts from the Mille Plateaux label but with a more pop music slant.

I composed a number of scenes within Ableton Live that I used to form the structure of the piece although I relied too much on creating separate scenes where turning off or modifying clips would have been sufficient. This serves to highlight to me the instrumentality inherent within Ableton Live in that it also requires a degree of learning and practice in the same way a traditional instrument would and also that external MIDI instruments such as the Korg NanoKontrol (see Figure 1) are providing the well designed limitations that instrumentality relies upon.

Sinebass

This composition explores further the Clicks and Cuts style of music but with a more minimal style. The concept behind this composition was to create something that represents a current successful mode of performance. This composition, more than any, would be at home in a club setting as it uses a number of conventions of popular dance music such as the heavily compressed percussion and musical movements occurring every eight bars. At 3'07" there is also a clear mixing of two elements as one part of the track comes to a close and another enters. This is a reference to DJing as the current most accepted mode of performance of electronic music.



Figure 1: Korg NanoKontrol

The Korg NanoKontrol is an inexpensive, portable controller designed specifically for laptop performance. It features 9 fully customisable faders and rotary controls as well as 2 customisable buttons per channel.

NanoClicks

This composition was my first to investigate performance with MIDI controllers. Unlike the previous two compositions that were not structurally complete before the performance, this one focuses more on the changing of parameters on the samplers. Drawing from John Croft's 'Thesis on Liveness' that the most obvious solution (to an easily identifiable performance) is to restrict the range of processes to the relatively transparent¹⁷: filtration, reverb, transposition, and so on. I mapped the Korg Nano faders to the volume of the glitch and sine tracks and the rotary faders to both the reverb output and reverb length of the sine track. As the composition was completed structurally prior to the performance the length is fixed. Logic's implementation of controller mapping is less flexible than Ableton's and the fixed length does not lend well to making mistakes. I would not say mapping traditional notions of instrumentality to a computer-based piece creates the most interesting of performances. I feel that computers will in time carve out their own conventional performance techniques.

Sjasja

This contrasts with the other Ableton Live pieces in that it does not have a typical dance beat. I wanted this to be the culmination of my efforts in Ableton so far, focussing on both structural and transformative detail with the Korg NanoKontrol rather than the mouse and keyboard. The sound design does not include any instrumentation and the focus is more on sounds that are only possible digitally, although by using multiple layers of similar clicks in the way that Pole does on the album *123* (2008) and simple dry delays, I was able to create subtle variations in texture. The Korg NanoKontrol works as an instrument in this composition, triggering multiple clips with one button where the mouse would require 3 or 4 separate clicks.

Rackudesu

Where I had relied on creating different scenes to implement variation on previous tracks I limited myself to creating only two for this one to encourage the use of the Korg NanoKontrol to automate parameters and change clips. I had to use the mapping feature of Ableton creatively to create structure for example mapping multiple channel play buttons to one Korg Nano button. The level of transformation and automated process available with the press of a single button takes the idea of an instrument's timbre being easily changeable to a whole new level although I am still not sure as to

¹⁷ Croft, J. (2007) 'Theses on Liveness' *Organised Sound*, Vol 12(1), p. 64

whether this can create an interesting performance as this limits the audiences idea to gauge the level of human interaction.

Pianwanwan

I composed this largely from a sampled A4 piano note as a way of limiting the sound design in the same way in which Alva Noto and Ryuichi Sakamoto collaborated on *Insen*. I mapped a number of transformative parameters to one rotary fader to try to create interesting timbral effects with the least amount of movement in a similar way to Julio D'Escriván's description of sentic movements in music¹⁸. An EQ on the master fader had its high pass filter assigned to a rotary fader as did the frequency of an auto filter, while the strip fader below this had been assigned to the wet/dry option in a filter delay as well as the resonance of an auto filter. This created a very powerful effect at 2'10", which I feel conveyed a very strong implied audible human interaction due to the non-linear movements of the filter parameters. Like with a traditional instrument, if the human interaction can be easily gauged by the audience then this can go some way to creating a level of trust and a more exciting performance.

¹⁸ D'Escriván, J. (2010) 'To Sing the Body Electric: Instruments and Effort in the Performance of Electronic Music' *Contemporary Music Review*, Vol 25:1, p. 187

4. Conclusion

What this project and its associated research has demonstrated to me as a composer is that people with a non-formal musical education carve out their own particular practice depending on their needs and the technology they use. Over time, these techniques will become the accepted norm for contemporary performance in electronic music.

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