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Introduction

Human perception of sound may not be restricted to aural stimuli as perceptual experience may not be modality specific (McGurk & MacDonald, 1976; Calvert, et al, 1997; Krumhansl & Schenck, 1997; Guttman, Gilroy, & Blake, 2005; Bulkin & Groh, 2006; Skipper, van Wassenhove, Nusbaum, & Small, 2007; McAuley & Henry, 2010; Man, Kaplan, Damasio & Meyer, 2012; O'Callaghan, 2015; Vilhauer, 2015; Su & Salazar-López, 2016). Several musical works by **Schnebel** generate an **imaginary or non-cochlear sound** through **live gestural performance, an image or a text**; as does **Pisaro's** text piece *Braids : for (silent) reader*; **Wolman** composes text pieces to evoke imaginary sound in **live concert and other modes**; and **Ablinger** uses still photography in *Music without Sounds*, a photo-series which 'only make sense when considered as music' (Ablinger, 2013, Seeing and Hearing section).

As **ventriloquism** seeks to reorientate the visible location of the human voice onto a dummy or character (Connor, 2000) and comic books imply sound through language (McCloud, 1993; Oyola, 2011; Vilhauer, 2015), the temporal medium of video may be capable of reorienting music beyond the fluctuations of air pressure associated with physical sound production (Berger, 2002; Guttman, Gilroy & Blake, 2005; O'Callaghan, 2015). Video presented the opportunity to apply my composerly experience of working with the temporal phenomenon of sound to an alternative temporal medium. Therefore, all pieces in the portfolio do not require any audio playback and do not have sound files attached.

Composing physically silent video pieces which conjure non-cochlear sound was not my original intention. My initial research premise was focussed towards the composition of video scores to facilitate live audiovisual performances through prepared improvisation. After attempting to realise my original intention I discovered several issues which prompted me to shift the project away from scores towards the composition of video pieces.

Although the shift produced some considerable obstacles it was ultimately a conduit to previously unfamiliar and provocative artistic approaches and concerns. Throughout the project I actively engaged with a process of following, doing or 'going along' (Ingold, 2013, p.1) by exploring and steering into the challenges of and for materials, concepts and pieces (Ingold, 2010) because 'art is a crucial, dangerous operation we perform on ourselves. Unless we take a chance, we die in art.' (Feldman, 1985, p. 52).

The main research interests of the portfolio were:

- Issues of authorship and ownership: composing video scores using found footage to facilitate live audiovisual performances through prepared improvisation
- Degrees of openness through video scores and subsequent performance
- The temporal qualities of sound and video
- Approaching video art theory and the aesthetics of dancefilm as a composer
- Using video to explore non-cochlear sound
- **Cross-modal perception** and video composition
- An underlying interest in exploring the notions of hard work and dedication in wrestling with the limitations of the physical body and the human condition, specifically aligned with musical and artistic performance (Arendt, 1998).

The website (<http://thesis.musicalmrfoc.co.uk/>) contains many of the scraps, doodles, drafts, dead-ends, hair-raising realisations and completed outputs from a year's worth of investigation into how I (a musician, composer, performer, tutor and intrigued human being) have approached video in creative ways.

Interest in the Screen and Composition

I was inexperienced in working with video prior to my undergraduate

studies at the [University of Huddersfield](#). As part of the Advanced Composition module I composed an experimental video score to facilitate a real-time improvised performance: [Questioner, 1863](#). Another experimental piece from my undergraduate training engaged with an audience's internal silent reading voice through the projection of text on screen. The experimentation and resulting pieces from that time represent a crucial stage in my development as a composer, with the experience I gained as an undergraduate providing the foundation for the postgraduate research project.

I entered into postgraduate study utterly convinced that continuing to compose video scores for improvised musical interpretation would be the sole focus of the entire project. However, after several months working towards this aim I made the difficult but essential decision to abandon the concept of the score altogether. Aside from a single video score the rest of the output in this portfolio forms an arc of finished video pieces as I realised ways in which I can work with video.

A full explanation of the evolution of the project and later work will be forthcoming but a discussion of [the early work and the realisations it conjured](#) are essential.

Acknowledgements

I would like to thank my supervisor, [Dr Bryn Harrison](#) for his unwavering support and encouragement throughout this project; [Dr Lisa Colton](#) and [Professor Aaron Cassidy](#) for encouraging me to undertake postgraduate study; all staff, fellow researchers, guest speakers and performers associated with [CeReNeM](#); and the Vice-Chancellor, [Professor Bob Cryan](#) for his [scholarship](#) which made this study possible.

I would also like to thank my family for their enduring support and my fiancée, Rachel Williams for her unwavering love and friendship.

Original Intentions

An overview of the project's trajectory may demonstrate the barriers which emerged through the composition of video scores and the impact upon the project. Expanded explanations and details of the issues outlined below can be found within the discussion of the portfolio.

The initial intention for the project was to compose video scores using found footage of instrumental performance to facilitate live audiovisual performances. I intended to create a notation to deal with sounds which were impractical to notate using the 'two-dimensional lattice' (Wishart, 1996, p. 23) of conventional five-line staff notation. Video had already proven to be a powerful medium in the evolution of the **graphic score**, moving from static images on paper to digital videos designed to guide the intuition of an improvising performer (Dean, 1989; Pancake, 2011; Smith, 2011; Vickery, 2012). My use of found footage was an aesthetic choice inspired by **plunderphonics**, **collage** and **décollage**.

Several of the project's initial objectives were prompted by **Pancake's** (2011) research into spontaneous improvisation guided by video scores. I wanted to encourage a performer to draw on their personalised knowledge of the instrument and codified frameworks of the world through inspection and introspection of a video score (Bollas, 1987; Whiten, 2000; Krathwohl, 2002). I believed that distorting, altering and rearranging the images within found footage which depicted instrumental manipulation would facilitate the desired levels of introspection.

Musical and physical gestures formed part of the initial premise of the project with embodiment and motor schema communicating potentialities for musical sound and gesture through video footage (Godøy & Leman, 2010). Specific visual instrumental information, such as the exact fingering used on a stringed instrument, was obscured using post-production video editing techniques to provide the performer with an indication of a gesture rather than full and explicit detail. Employing a model of prepared improvisation, rather

than Pancake's (2011) use of spontaneous improvisation, was intended to provide the performer with the tools and space to investigate the score and generate strong audiovisual connections (Sági & Vitányi, 1988). A further objective of the initial premise was to project the video score within the performance space to subvert the private dialogue which exists between the performer and the score (Foss, 1962; de Haan, 1998; Godlovitch, 1998; Hope & Vickery, 2011). This political aesthetic may have yielded a dynamic performance element for an audience through the real-time delivery of intrinsically connected visual and sonic information.

As a musician and composer who had only ever worked with sound I immediately approached video in much the same way as I did a composition of sonic material. I considered the contrasting and the sympathetic elements within parameters such as structure, rhythm, tempo, dynamic range and the performance space. Crucially, I wanted to compose without hearing any of the audio from the original video files themselves as I intended to compose from a position divorced of heard or expectant sound. This discipline was maintained throughout the portfolio as I began to create my own silent footage. The result was the piece *Portals*, performed by Kanno in concert at the [University of Huddersfield](#).

However, following the completion and performance of *Portals* I began to realise that conventional systems of notation, such as the five line staff, may actually have provided a more effective method of notating the sounds which resulted from a performance of the video score. The images used were so strong they encouraged a performer to try and copy them exactly. This was troubling as it signalled that my approach did not take full advantage of the medium and failed to move away from a conventional approach to notating sound, as had been originally intended: I wanted to create sounds which would be difficult or impossible to notate using systems designed to deal with a 'lattice of discrete values' (Wishart, 1994, p. 106).

A Realisation and a Change of

Direction

There followed a turbulent period fuelled by uncertainty around my ability as a new researcher, let alone a fledgling composer working with an alternative medium. I persisted with experiments into video scores, creating my own video material in the search for an approach and footage which would be less likely to generate literal sonic representations of the images as was the case in *Portals*.

Following an opportunity to discuss my work with [Ablinger](#) in late February 2016 I began to question my original intentions towards video. By mid-March the portfolio had shifted towards an investigation into composing video pieces, rather than scores, as a composer of sound. Had I pursued the video score project it may not have yielded a 'new aesthetic ontology of performance' (Newton, 2014, p. 4) as I had desired, but instead may have led to the creation of audiovisual pieces which would ultimately sound as if based upon a 'finite set of possibilities' (Wishart, 1996, p.7). However, the time spent creating original video material in the continued pursuit of scores was far from wasted: I had engaged in experiments with the physical nature of video and issues relating to content creation, such as lighting and camera angles.

A [playlist which comprises 28 drafts, experimental pieces and prototypes](#), made from December 2015 to March 2016, may further demonstrate my changing approach to video. I also share most of my [handwritten notes](#) which detail forlorn and realised ideas, sketches, experiments, trials, problems and solutions as these may provide the reader with further insight into my work and may be 'more interesting than the final product' (LeWitt, 1967, p. 14).

From Scores to Something Else

Making the transition from composing scores to pieces was anything but straightforward as my reading and preparation was geared towards working with improvisation and [graphic scores](#). In searching

for ways to make video pieces it seemed logical to explore how some composers used video in their work. I was already somewhat familiar with [Kreidler's 22 Music Pieces For Video](#) and several of [Walshe's pieces](#) in which video has its own role in live performances (Saunders, 2009; Gray, 2013). Kreidler's work explores several uses of video, approaching it as an instrument, a performer and a medium; while Walshe's use of video is connected into and amplifies the physical aspects of live performance through installations, chamber and theatre works (Saunders, 2009; Oliver, 2014; Lampo, 2015). [Ter Veldhuis \(JacobTV\)](#) provided another very interesting use of video in performance in which the prosody of speech is arranged into musical material to create powerful audiovisual works (Jeffery, 2014).

It became clear that video could be approached through a multiplicity of intentions as I continued to explore work from Kreidler, Walshe, [Mutendorf](#), [Marino](#) and [Carvalho](#). Another perspective was provided by [Niblock's](#) intermedia work *The Movement of People Working*. Niblock seemed to create contradicting temporal trajectories between the sound and visuals which required an audience to engage with several streams of information simultaneously (AV Festival, 2012; Kase, 2012; Extreme Music, 2016; Wang, 2015). Confronted with a myriad of approaches, I remained uncertain on how to proceed.

Finding a New Path

Although I understood that video could be a versatile medium with vast possibilities for music-making I struggled to find a niche and a burning question to explore. Experimentation and exploration into unfamiliar areas had often produced some exciting results, therefore it was vital that I find something which greatly concerned me (Cassidy, 2012).

Switching my focus from composing video scores continued to be troublesome. However, thanks to [my supervisor's](#) encouragement and positivity towards exploring and engaging with multiple art

forms, an unexpected angle was revealed through Burrows and Fargion's *Both Sitting Duet* in which Feldman's *For John Cage* was realised through the silent motion of their upper bodies.

This impressive and curious piece not only introduced Kandinsky and spurred my interest in composing visual art influenced by music but also choreography and dancefilm, igniting a particular interest in works using the close-up shot and micro-choreographies (Balázs, 2010; Brannigan, 2011).

Through curiosity prompted by reading into the history of choreography and the close-up in dancefilm I revisited the history of film and video, particularly the experimental films associated with the Dada-Constructivist movement (Rees, 2009). This recalled some buried ideas surrounding visual art, video art and pieces from early experimental film pioneers such as Ruttmann's *Lichtspiel*, Richter's *Rhythmus 21*, Eggeling's *Symphony Diagonale* and Fischinger's *An Optical Poem*, revealing a potential for musicality within the medium. Ruttmann, Richter and Eggeling's works were particularly attractive through the exploration and organisation of rhythmic qualities within a silent landscape (Turvey, 2003; Rees, 2009). These works exposed me to a tradition of artists using musical structures in the medium of the moving image, including the colour organ and work of the Italian Futurists Ginna and Corra (Evans, 2005; Ox & Keefer, 2008).

A new direction for the portfolio began to emerge as I realised that visual music, electroacoustic music and audiovisual practice shared some common sympathies and concerns towards composition (Moritz, 1986; Evans, 2005; Garro, 2011; Hyde, 2012) and that I could merge these with images of the hand through video art and dancefilm.

Evolution of the Portfolio

Examining dancefilm and video art's concerns with the representation of the body on screen helped to fix a concept of the mechanics of video editing as tools to be explored through my

compositional practice (Donebauer, 1996; Brannigan, 2011). The physicality of video quickly became a primary concern which informed each piece in the portfolio, starting with *Syncretism*.

An equally strong and central part of my emerging aesthetic was prompted by *Syncretism*. The phenomenon of **cross-modal perception** was made apparent through feedback attained following a screening of *Syncretism* in a **CeReNeM** seminar and only fully realised by following up further with reading into **ventriloquism**, visual dominance over auditory stimulus (Berger, 2002) and the **McGurk effect**.

Étude and *Apprentice* were composed in response to seminar feedback and as experiments with an artistic and musical use of the cross-modal phenomenon, informed by video art and dancefilm theory. Subsequently, the focus of the project moved towards the exploration of the perception of sensations and temporal experiences presented by video. **Merleau-Ponty's phenomenological** writings on experience and perception helped to situate my efforts within the context of experiential philosophy, creating a critical space essential for reflection on the direction of the portfolio.

Working with Light and/or Sound

Visual music and video art cemented the concept that sound and light stimuli were capable of being subjected to similar modes of composition as they were temporal and presented similar challenges to the artist working with either (or both) (Donebauer, 1996; Ox & Keefer, 2008; Hyde, 2012). Many of **Turrell's** early concerns with how light can alter the perception of space, such as *Afrum (White)*, are comparable to an artist sculpting with clay and provided an informative perspective (Spector, 2016). Like Turrell's earlier work, abstract video references things outside of itself, broadening the possibilities for exploration (Jennings, 2015). However, unlike visual music, I was interested in using representative images of the human hand which strengthened my interest in dancefilm.

The Human Hand

I believe that my 13 years as a practicing music tutor had a direct influence on my decision to use the imagery of human hands as I have expended considerable time and energy on scrutinising and developing my own instrumental technique and that of my students.

Video editing technology became a more prominent feature of the project and with it my intentions for using images of hands altered. The focus quickly shifted towards the material nature of video and the mechanics of video editing, with the continued use of the close-up shot in subsequent pieces employed to amplify microscopic movements of the hand (Benjamin, 2005). For *Syncretism*, hand movements were a temporal visual material for technological intervention, whereas the use of hands in *Étude* and *Apprentice* aimed to focus attention towards rhythm and instrumentation through representation and an underlying narrative. Therefore it may be possible to consider the portfolio as an attempt to assimilate the video medium and associated technologies into my already established cognitive frameworks of musical and compositional practice.

Presenting moving images of human hands carried the potential for a vast array of **meaning and value** to be inferred, which was problematic. It was necessary to **define and classify gesture** within my work as my intentions towards video began to change but my interest in the human hand expanded. Actively encouraging the viewer to consider and interpret the shapes of the hands became a source of particular interest in the composition of *Apprentice* through the use of hand shapes associated with instruments, taking some inspiration from **Nauman's** bronze sculpture *Fifteen Pairs of Hands*. I reached this point through the composition of *Étude* which used footage derived from a classical guitar performance, repetition within an economy of material and interventional editing techniques.

Defining and Positioning Gesture

A consideration of bodily communication was essential following the composition of *Portals* as my intentions for the medium shifted, altering the intended function of the imagery (Sullivan, 1984).

The depiction of a hand within the context of a video score served to prompt and cajole the performer into replicating seen movements on a chosen instrument to create a musical performance. It could be argued that the physical movements represented in the video score for *Portals* may be considered as 'genuine gestures' (Godøy & Leman, 2010, p. 5) as they attempted to communicate meaning and expression. However, the hand shapes and gestures in *Syncretism* were not intended to encourage any sort of replication, nor to communicate any emotional or linguistic meaning through the shapes themselves (Rubidge, 2010; McCormack, 2014). Both *Étude* and *Apprentice* made direct attempts to communicate particular instrumental information through hand shapes and gestures associated with instrumental techniques. *Cunningham* summarises his working process in which he divorced the movement of the body from music and plot:

Syncretism was the first piece in which the movement of a hand created material devoid of an intention to communicate linguistic meaning: video captured simple physical movements which were amplified through editing, looping and repetition to advertise the presence of video editing processes. As these images made no attempt to adhere to any social or cultural systems of bodily communication I did not consider them as gestures but as recognisable images to be manipulated (Argyle, 1988; Godøy & Leman, 2010; Ben-Tal, 2012). Linguistic or emotional meaning may of course be assigned to the hand shapes used in *Syncretism* but they would be devoid of context. Narrative was not created through the communicative potential of the hand but through repetition of visual images, shifting attention away from the hand itself by amplifying the physicality of video:

‘The rendering process goes beyond reproduction, bringing the choreographic elements into a new state or condition; the film/filmmaker enters into an intense dialogue with the subject matter so that the point where the dance begins and ends becomes redundant, the film itself becomes dance-like’ (Brannigan, 2011, p. 127).

Following *Syncretism* and the use of bodily movement my interests became more focussed on using interventional video editing techniques to establish rhythm. I continued to use images of the hand but wanted to create rhythm in the visual domain through video editing to explore **cross-modal perception** and **non-cochlear sound**, first with *Étude* and later with *Apprentice*.

Disembodied Hands

Rather than composing videos using abstract imagery, which may have aligned the work more closely with visual music (Evans, 1992; Evans, 2005; Ox & Keefer, 2008; Garro, 2011), I wanted to continue to compose using imagery of the hand and align myself with aspects of dancefilm, video art, music and visual music.

Using imagery of disembodied hands raised an issue related to lived experience and bodily awareness through associations which emerge from representational imagery (Piché, 2003): as the viewer observes a hand a psychological construction relating to an unseen body may develop (Merleau-Ponty, 1962). **Merleau-Ponty’s** (1962) account of **anosognosia** and the **phantom limb** demonstrates how even though an appendage has been severed its continued physical existence can manifest as a third person causality, described as ‘a long, cold snake’ (Lhermitte, 1939, as cited in Merleau-Ponty, 1962, p. 88). Essentially, mimetic images of the hand may provide a viewer with more value than was intended. Additionally, a viewer may consider the hands to be communicating a linguistic meaning, perhaps as a type of **sign language**. To a degree this was true of *Étude* and *Apprentice*, through the representation of musical instruments, but caused an issue for *Syncretism* as the piece was

constructed to bring attention to the video medium itself, rather than communicate linguistic meaning.

In Beckett's one-mouth play *Not I*, a disembodied mouth is rendered by a spotlight in a dark theatre and unleashes a relentless stream of soliloquy which loops on and around itself, performed to exact and precise instruction (Pettifer, n.d; Lezard, 2009). The reduction of the body to the mouth silently reinforces a lack of identity within the character and the apparent inability to refer to the self in the first person (Pettifer, n.d; Laws, 1996). Beckett was successful in focusing attention not on to the absent body but towards the intensity and form of the frenetic speech, as for Beckett 'it is the shape that matters' (Gontarski, 1985, as cited in Laws, 1996, p. 35).

Consideration of the projection scale for each piece was vital as I wanted the hands to be unnaturally and unfamiliarly large. In his discussion of the phantom limb Merleau-Ponty (1962) observes that the patient considers the phantom limb to be enormous after amputation but that it shrinks into the stump 'as the patient consents to accept his mutilation' (Lhermitte, 1939, as cited in Merleau-Ponty, 1962, p. 88). My intention for *Syncretism* was to present the possibilities for movement within the hand through which the techniques of video editing would become apparent, rather than attempting to create a *kinesthetic empathy*, while *Étude* and *Apprentice* worked with representations of hands engaged in musical practice (Wilkins, 2014).

Conjuring Cross-Modal Perception

By embracing video devoid of audio tracks it may be possible to engage with a uniquely personal and internal sound world, as Cage asserted in a discussion of the nature of sound and silence: 'It is inextricably synchronous with all other, sounds, non-sounds, which latter, received by other sets than the ear, operate in the same manner' (Cage & Gann, 2011, p. 14).

Human sensory perceptual experience arrives via external stimulation of the sensory organs which can be organised into

several modes. The body is frequently subjected to multiple modal experience and research suggests that perceptual experience may not be isolated to one particular mode (McGurk & MacDonald, 1976; Krumhansl & Schenck, 1997; Berger, 2002; Guttman, Gilroy, & Blake, 2005; Bulkin & Groh, 2006; Skipper, van Wassenhove, Nusbaum, & Small, 2007; McAuley & Henry, 2010; Man, Kaplan, Damasio & Meyer, 2012; O'Callaghan, 2015; Vilhauer, 2015; Su & Salazar-López, 2016). **Cross-modal perception** offers an explanation as to why humans sometimes report experiential phenomenon with the features of another sensory experience, such as having a sensation of sound when viewing images. I first became aware of the potential for video to conjure cross-modal perception and **non-cochlear sound** following a performance and subsequent **group discussion of my piece *Syncretism***, which was not intended to create cross-modal interactions. I followed this up with reading into **ventriloquism**, research into visual dominance over auditory stimulus in the **McGurk effect** and **composers who intended to specifically engage with a non-cochlear sound**.

Étude was the first piece in the portfolio to attempt the generation of a non-cochlear sound using video. My approach drew on techniques from experimental films of the early twentieth century and approaches to composing pieces of visual music, such as the use of **montage** to form large structural schemes (Evans, 1992; Turvey, 2003; Evans, 2005; Fuxjäger, 2012; Keefer, 2015). New visual rhythms were created from recorded footage by altering natural hand movements using interventional video editing techniques similar to those used by **Arnold** and **De Bemels**. Drawing on **Eisenstein's** (1949) concept of **metric montage**, which is the arrangement of frames of the film within the shot (Eisenstein, 1949; Evans, 2005), the use of hard cutting, slow motion and extreme repetition at the local level resulted in an amplification and exaggeration of movement (Benjamin, 2005; Koupil & Vícha, 2011).

My approach to ***Étude*** did not connect directly with research into cross-modal perception which I later engaged with for ***Apprentice***. However, I did draw heavily on experimental film pieces of the early twentieth century which focussed on manipulating light and various optical media as an abstraction of the treatment of sound by composers without generating non-cochlear sound (Turvey, 2003;

Evans, 2005; Ox & Keefer, 2008; Alves, 2012; Fox-Gieg, Keefer, & Schedel, 2012; Keefer, 2015; Mollaghan, 2015). Although, McLaren's *Synchromy* reportedly featured 'pseudo-/culturally synaesthetic associations' (Mollaghan, 2015, p. 12). *Étude* also drew on several pieces of dancefilm such as Rainer's *Hand Movie*, and Robert's *Hands* which were highly influential on the composition of the previous piece *Syncretism*. Even though the approach used in *Étude* may not produce non-cochlear sound the purposeful, musical arrangement and structuring of the moving hand in the visual domain should be evident (Krumhansl & Schenck, 1997; Su & Salazar-López, 2016).

That is not to say that experimental film and visual music pieces, as well as my own work, which organised moving imagery based on the techniques more readily associated with sound-based media would not generate any sort of non-cochlear sound. Some evidence suggests that, although it may not be automatic (McAuley & Henry, 2010), rhythmic patterns of light and video may be able to trigger forms of cross-modal perception (McGurk & MacDonald, 1976; Berger, 2002; Guttman, Gilroy & Blake, 2005; Skipper, van Wassenhove, Nusbaum & Small, 2007). Of course, works which do not attempt to generate a non-cochlear sound should, for the sake of the work, be considered within the realms for which they were intended (Cox, 2005; Shaw-Miller, 2014). Furthermore, it could be argued that moving imagery which depicted intentional and known bodily motions, such as playing the guitar, may initiate a form of *kinesthetic empathy* in a viewer (Fischman, 2011; Strukus, 2011), rather than a sense of sound. It may also be equally likely that a viewer would experience only the visual aspects of the work itself, such as the visual content and structure, rather than experiencing any sort of cross-modal perception (McAuley & Henry, 2010).

Apprentice adhered more closely to the research into cross-modal perception which studied rhythm perception in sound and light using very simple visual imagery (Guttman, Gilroy, & Blake, 2005; McAuley & Henry, 2010). My intention was to compose a piece of music as my final piece for the portfolio which would generate non-cochlear sound through visual stimulus. I attempted to engage with flashing images of hands in various poses associated with musical instruments to create rhythmic pulses but several *issues remained*

with the approach.

Discussing the use of notation in musical practice could reveal why my pieces may fail to conjure non-cochlear sound. Just as one may be able to create an internal representation of written language while reading, which can be experienced in Ablinger's *Weiss/Weisslich 11B* and *Pisaro's Braids : for (silent) reader* (Gottschalk, 2016), musicians with a proficiency in reading musical notation may be able to create a 'visualisation' (Giesecking & Leimer, 1972, p. 18), an 'audiation' (Gordon, 1994, p. 39), or mental representation of a piece of notated music. Although applied specifically to the discussion of reading musical notation, Gordon (1994) asserts audiation as 'the process that takes place when we hear and comprehend music for which the sound is no longer physically present' (Gordon, 1994, pp. 39-40), an ability which can also be applied to non-reading musicians (Ginsborg, 2004; Duckworth, 2009; Gennet, 2016). These approaches are bound by the understanding of a fundamentally societally agreed upon set of rules of language and literature (Gordon, 1994), to which *Apprentice* may be ascribed through the representation of instrumentation but *Étude* may not.

Composing *Portals*

Portals was composed as a video score designed to elicit a fully prepared improvised musical response based solely on the information in the score. The video score would be projected to an audience, creating a real-time audiovisual piece.

The initial concept was a partial response to Pancake's (2011) use of abstract imagery in video scores which required performers to create spontaneous improvisations in the performance space. The composition of *Portals* also drew on Cardew's *Treatise* which was itself designed 'as a consistent system of symbolic elements that could be used to inform a performance of agreed-upon meanings for each symbol' (Anderson, 2006, p. 1). My concept was further reinforced upon hearing Gaffney (2015) discuss her historical encounter with Richier's *L'Eau* in the symposium *Thought Positions*

In Sculpture:

‘Through the form of the work I encounter woman-ness which is my own recognition of living in a female body. The highly resolved areas of tightly modelled clay around the sternum, shoulder and breast areas of the body effect an experience of embodied woman, which holds in material form what I know’ (Gaffney, 2015, p. 2).

I aimed to compose a video score which would guide the intuition of a performer, revealing their interpretations and experience of the video score on the instrument. My intention was to use bodily motion in an attempt to realise sounds which may not be easily communicated to a performer through a conventional gridded system of notation (Wishart, 1994; Wishart, 1996). Unfortunately, upon reflection I found that my approach to the visual stimulus led to a literal duplication of the movements depicted on screen rather than eliciting a search to find possible sonic interpretations through the instrument. My decision to use footage depicting violin performances inevitably provided rich and detailed pitch and rhythmic information which resulted in a literal translation of the visual image and a piece which sounded as though composed using a gridded system of notation (Wishart, 1994; Wishart, 1996).

Building on Previous Experiences

Questioner, 1863 was my first attempt at composing a video score and informed a great deal of my approach towards the intention for *Portals*. Unfortunately, *Questioner, 1863* did not use footage with **Creative Commons licenses** and cannot be included. However, it was performed and recorded in a workshop by **Ruffer** in 2015 at the **University of Huddersfield**.

Composing the piece for Ruffer’s workshop was very much a daunting leap into the unknown, encouraged by my **teacher**, which was no doubt a significant, crucial and defining episode. One highly informative point of the workshop was Ruffer’s tumultuous

interpretation of a close-up shot from a particularly **frenetic Jethro Tull performance**. However, Ruffer commented that she recognised several musicians in the score and made attempts to replicate their style in her performance (Ruffer, personal communication, March 3, 2015), which I considered to be problematic and informed my decision to remove any images of the performer from the video when composing the score for *Portals*.

Influences

The composition of *Portals* called on a network of nodes and influencing forces (Adkins & d'Escriván, 2013; Adkins, 2014), from **Duchamp's development of the readymade, Schwitters' Merz, Oswald's Plunderphonics, Kreidler's *Compression Sound Art* and remix culture**, manifesting in the use of found footage. All video files were acquired from sources with an appropriate **Creative Commons license: CC BY**, with links and more information available in the **performance notes**. The visual characteristic of the score was reached through a need to remove each image from its original context by appropriating only that which was required to transmit the desired message, an approach informed by the work of **Vostell's television décollage** and **Paolozzi's collage-based silkscreen prints**. While the treatment of image was influenced by visual art, composers working with **graphic scores** such as **Cage, Cardew, Brown** and particularly **Wolff**, who 'places the pianist and the instrument right at the heart of the work itself' (Thomas, 2008), provided musical contexts for my thinking.

Initial Stages of Composition

Finding suitable footage and removing unwanted images was the first stage in composition, achieved using video editing software. Unwanted elements of the image were first removed through a form of digital décollage and collage, with several clips being

consolidated into a new video file. A circular **mask** allowed the entirety of the left hand and wrist to be visible, while an oval mask preserved the vertical movements of the bowing, with both being presented as positive spaces set within a black negative space. Two reflective reports, written after the completion of the **composition** and following the **performance**, explain post-production effects in more detail.

An underpinning premise for *Portals* was to engage with the performer and audience's ability to retain and recall audiovisual information within a temporal perspective (Snyder, 2001). Composing with an economy of material would increase conscious awareness by reducing memory load (Snyder, 2001): by selecting only close-up and extreme close-up shots it was possible to reduce the unmodified video file significantly. The remaining chunks were refined through cropping before being arranged into short phrases, as can be seen in **videos 1-12** of the drafts and experiments playlist. This approach helped me to develop a familiarity with the footage which aided the composition of phrases, particularly a 30-second bowing cell which underpinned much of the piece. Looping of the bowing cell in the final score acted as an amplifier in bringing attention to shorter clips of left hand footage (Thompson, 1979; Glover & Harrison, 2013). This was intended to further reduce memory load and allow the performer to make connections between left and right hand materials more effectively (Snyder, 2001).

I arranged cells and phrases by observing and aligning the movements depicted in the images without any concept of an ideal or desired sound. I felt that to do otherwise would have been inimical to the premise of the piece. The audio tracks were removed from each video file before commencing with deconstruction, editing and reconstruction. My initial approach to the composition was to simply push and pull the short clips around using **software**, attempting to make connections between them. Some outcomes of this approach can be seen in **videos 13-16**.

Use of Screen Space

Rather than creating static portals operating from fixed points within a negative space, movement around the screen space generated parameters for performer interpretation. A reduction of explicit pitch information within the image was intended to guide the performer to develop their own conclusions regarding pitch but also promote engagement with the motion of the image within the overall space. The **instructions for interpretation** provided a degree of direction but connected the horizontal movement of the bowing portal as relative to the position of the bow on the string. Several factors including vibrato and changes to bow pressure were suggested to be attributable to the size and location of the left hand portal.

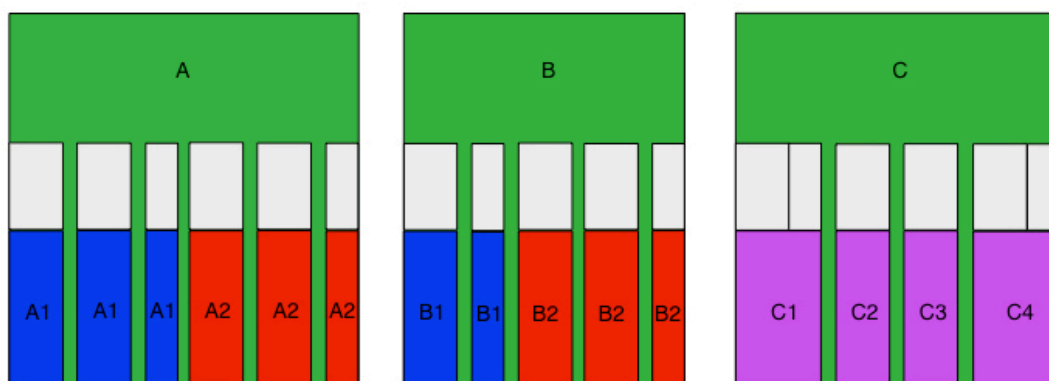
Working with Structure

An outline of three large sections began to emerge through the process of editing out unwanted parts of the image and arranging clips based on the visual content, rather than by thrusting a conscious consideration of form upon the materials (Ingold, 2010). Recognising that form was beginning to emerge I drew influence from Cage's *First Construction (In Metal)* as I was aware that his use of the square root or micro-macrocosmic form had been solidified in the composition (Guessford, 2004). Further influence came from a compositional strategy often employed by 8-bit video game composers as a response to the constraints on system memory in which larger structures were constructed by looping short phrases (Collins, 2007; Fox, 2016). I did not want to determine any musical parameters using Cage's approach as I was confident with the content of the clips. However, acknowledging accumulative and micro-macrocosmic forms as potential methods for establishing form jolted my imagination towards a method of organising the bowing cells. Decisions relating to the frequency, spacing and order of the bowing cell were reached through intuition, experimentation and constant re-drafting rather than being governed by a system of ratios (Guessford, 2004).

Employing a ternary form was intended to advertise the contrasts between the visual content of the clips for the left hand: **section A (00:10 - 02:48)** featured a small series of distinct stationary positions within a restricted range on the fingerboard; **section B (02:58 - 05:06)** only used footage of glissandi articulation over a wider range of the neck; and **section C (05:16 - 07:46)** combined stationary and glissandi articulations.

Creating subsections enabled a more successful arrangement of discrete phrases featuring left hand footage by specifying duration, providing cues and a classification of visual information. Subsections were labelled as **A1 (00:10 - 01:28)**; **A2 (01:30 - 02:48)**; **B1 (02:58 - 03:45)**; **B2 (03:47 - 05:07)**; **C1 (05:17 - 06:01)**; **C2 (06:03 - 06:33)**; **C3 (06:36 - 07:07)**; and **C4 (07:09 - 07:46)**. Each subsection acted as a container for a specific type of image: A1, B1, C1 and C2 contained still images while A2, B2, C3 and C4 contained moving images.

The diagram below may provide a visual example of the overall form and structure of *Portals*. The large sections (A,B and C) are coloured green while still and moving images, which make up the subsections, are coloured blue and red respectively. Subsections C1-4 are coloured purple to represent the amalgamation of still and moving images.



Legend



Structural Diagram of *Portals*

An understanding of the mechanics and physical properties of the violin was essential when arranging the clips of both hands to ensure that changes in left hand position would be in sync with a bowing direction (Adler, 2002).

Possible Approaches to the Score

Whiten's (2000) study into primate culture and social learning indicates that as individuals who develop our cognitive abilities within a society, we are guided by strong cultural codes and practices which are subsequently imprinted upon us by this society and the various practices within it. It can be argued that we learn partly through observing and repeating the successful behaviour exhibited by others, and that we develop our own sense of successful practice which can further be recognised in the practices and behaviours exhibited by other individuals. *Portals* was an attempt to apply learned and codified instrumental frameworks to a piece of music by calling on a performer's experience of the instrument and **knowledge a posteriori** through representative images.

Portals presented information to the performer through static and moving images which depicted conventional and idiomatic hand and bowing movements, albeit somewhat disguised and altered. This information was revealed gradually through a temporal perspective which required the performer to analyse, memorise, recall previous events and predict repetition (Snyder, 2001). The gradual revealing of information called on the performer's memory as well as analytical and creative skills which were underpinned by their detailed knowledge of the instrument (Merleau-Ponty, 1962; Krathwohl, 2002). It may therefore be appropriate to suggest that an improvisatory form of exploration could be employed when approaching the score (Smith & Dean, 1997; Griffiths, 2010).

The principle that a mediated physical gesture would be interpreted and recoded into sonic musical gestures was reached by considering the function of conventional systems of notation within the Western musical tradition. The five-line staff has become an almost universally accepted codified system which guides performers via their experience of working with the notational system of predetermined rules and principles from which pedagogies, performance traditions and issues relating to physical enactment of the notation have developed, including musical gesture (Godlovitch, 1998). Moving images, taken from video files which originally documented live performances, were re-appropriated to form a score intended to create a new performance. Therefore, live performances of *Portals* produce both **physical and musical gestures** (Argyle, 1988; Leman & Godøy, 2010).

Critical Engagement

Kanno's skilled, prepared and dedicated performance of *Portals* not only provided great satisfaction through a talented professional interpreting my work but also enabled further discussion and understanding of the composition of video scores.

One major concern surrounding the performance of the piece was the use of a transcription during performance. Although this allowed Kanno to explore ideas for rehearsal, the use of the transcription during performance unfortunately nullified several aspects of the intended aesthetic. As previously stated, an ideal performance would have fully engaged with the temporality of video and the retentive and protentive capabilities of the human performer and audience (Snyder, 2001; Kelly, 2016). For example, performing Wolff's *Duo for Pianists II* demands that performers be constantly operating on the edges of action and restraint (Thomas, 2010). In the case of *Portals*, the reactions of the human performer and their attempts to keep up with, recall and predict the next sequence in an unstoppable and unyielding stream of information were significantly altered by the use of a transcription. During rehearsal it became clear that Kanno attempted to create a faithful response to the motions she had

witnessed in the video performer's skilled and precise bowing technique (Kanno, personal communication, January 20, 2016). Due to the level of detail in the images the movement of the portals around the screen space were largely unused except for the changes to size of the left hand portal being attributed to degrees of vibrato: the larger the portal, the wider the vibrato as can be heard at 00:45-54.

Kanno's performance revealed that the explicit rhythmic and pitch information presented by the score was too strong to yield performances based on anything other than a reproduction of the images within a literal and finite set of parameters, rather than encouraging an internal discussion of potential realisations (Mooney, 2011). Furthermore, due to the use of a music stand and transcription during performance, the desired connections between the score and Kanno's interpretation were rendered unavailable to the audience: it may have been unclear that the video was the score. The use of a transcription in live performance may have skewed audience perception of the audiovisual contract (Chion, 1994) closer towards a cinematic context where sound is typically subservient to image, usually supporting visual cues and narrative (Maloney, 2005; Fox, 2016; Westgeest, 2016). It could be further argued that the projection of the video score diminished the performer's role while exacerbating the issue of a hierarchy between visual and auditory forms (Prévost, 1995; Kahn, 2001).

The literal interpretation of the score points to it being too prescriptive, able to 'be compared to a kind of instruction manual' (Kanno, 2007, p. 235). It may be possible to attribute the literal interpretation to the limited range of instrumental information in the score affording ease of access through Mooney's (2011) frameworks and affordances model. Engaging with Mooney's (2011) spectrum after the fact of composition showed that affordances at the bottom range may only sufficiently engage a performer in the task of recalling the sequences of events, which in the live performance of *Portals* was rescinded by the use of a transcription. A low resistance in the score created a scenario in which literal movements became the currency of the piece, resulting in music with a clear grid-like approach to pitch and rhythm. Further obfuscation of pitch and rhythmic information may work to de-

emphasise the grid: showing only the back of the fingerboard or removing the left hand entirely. Bowing could even be represented by a dot or line, indicating bowing direction and rhythm without suggesting string interaction.

Baldwin's *[HoldingOn]* actively engages the performer in the production of the score, placing them at the centre of the piece. Baldwin's interest in the performing body and performance space provided an interesting perspective on video which may produce a platform from which a performer can 'interpret the score rather than solely reproduce the score' (Baldwin, 2016 More Precise - Points of Contact, and Abstraction in Video Scores section, para. 4): something which *Portals* failed to accomplish.

By not providing the performer with enough resistance and making the information too obvious, *Portals* resulted not in an open score as initially intended, but a rather closed and complete one (Eco, 2004). Shlomowitz's *Letter Pieces* exemplify the organisation of material within an open score. Creating a piece in which the performer were able to attribute sounds and actions within a determined structure may engender space for investigation and introspection. Interpretations may differ widely between performances of the work, potentially engaging with and exposing the performer's knowledge *a priori*. Considering similar approaches towards composing video scores may also enable a more interesting use of the temporal medium through play speed and variations in metre, including arresting or advancing the frequency of images.

Despite my criticisms of *Portals* in relation to an improvised audiovisual piece for live performance, there may be a positive direction for the approach. Considering Whiten's (2000) research in which observation and copying are seen as central to cognitive and social development, literal information may be useful in composing pieces for people with little or no prior musical experience, such as young children. Composing videos depicting movements on an instrument may even be tailored to provide instruction on posture and technique. The internet has provided a platform for *tutors and musicians* to disseminate instrumental tuition videos for several years.

Composing *Syncretism*

Syncretism was the first piece to demonstrate a change of direction for the portfolio, initiated by the failure of *Portals* and subsequent attempts to draw out and channel a performer's unique knowledge of their instrument through video scores.

Syncretism was composed from a conscious decision to unite my understanding of video art, dancefilm and visual music with my existing composerly experiences. *Syncretism* dealt with the physicality of video in an attempt to direct viewer attention towards the medium through affective editing techniques (Garro, 2011; Meigh-Andrews, 2014), and was conceived as a large projection piece for a gallery space. Eisenstein's (1949) concept of *metric montage*, as discussed by Evans (2005) in application to *visual music*, played a significant role in the formation of the piece as one of the main areas of research.

I was approached by my supervisor to prepare a piece for a seminar in which the visual aspects and interpretations of Cardew's *Treatise* would be explored. This was particularly intriguing as *Treatise* is able to stand by itself as a work of visual or graphic art (Dennis, 1991) and continues to evade definitions in terms of being a composition or music (Anderson, 2006). Nyman (2009) observes that *Treatise* encourages a myriad of possible interpretations:

'*Treatise* reveals itself when the performer(s) form some sort of non-representational relationship between symbols and materials and treatments (which need not be of a sound variety) - or a mixture of both. . . . What is important, overall, is a contextual consistency: in *Treatise* a sign has to be made appropriate to its context' (Nyman, 2009, p. 118).

As an interpretation of a single page of Cardew's *Treatise*, *Syncretism* draws on Burrows and Fargion's *Both Sitting Duet* which is itself an interpretation of Feldman's *For John Cage*, through the introduction of choreography, dancefilm and visual music to the

research project.

Approaching *Treatise*

I was somewhat familiar with the visual make up of *Treatise*, such as the lifeline and the large black circles which form the climax of the piece (Dennis, 1991), through my time studying improvisation with **Thomas** and **Fell**. I very much wanted my approach to remain true to my concerns regarding sonic improvisation: to find unexplored avenues rather than relying on my existing knowledge and cognitive constructs (Griffiths, 2010). Understanding that interpretations could be based upon single pages or page-ranges of any order (Cardew, 1971; Anderson, 2006), and recalling the concept of a 'heuristic dialogue' (Prévost, 1995, p. 3), I focussed on searching the score for pages which revealed some possibility for physical movement rather than relying on my experiences with sound-production (Gendlin, 1993). During the **interim between** *Portals* and *Syncretism* I discovered that a fixed elbow position would concentrate movement onto the wrist, which tied my work to the concept of micro-choreographies and the use of the close-up in dancefilm (Brannigan, 2011). My initial trials started with **movements that were too small**, revealing little of interest. **Rainer's** *Hand Movie* demonstrated micro-movements which showed detail as well as larger, more distinct movements such as **pronation and supination** of the wrist.

Although *Hand Movie* presented an ideal approach to movement and the screen, my improvisations with bodily movement were, at best, unproductive. I had an apparent inability to maintain a focus on my performance while in front of the camera, instead concentrating on remaining in frame or worrying about lighting. Researching choreography for the screen pointed my reading towards the significance of rhythm (Roberts, 2012) and subsequently towards Eisenstein's (1949) five types of montage via Evans' (2005) discussion on visual music. Evans' (2005) discussion of the musical phrase in visual music practice revealed that metre can be established 'by making each cell the same length - the same number of frames. Each cell is like a phrase of music' (Evans, 2005, p. 19).

The concept of rhythmic montage bolstered my interest in video editing techniques as compositional tools and as an aesthetic enquiry, directly informing my approach to *Syncretism*. Cutting into the footage to alter the number of frames within each physical gesture would enhance or distort the natural movements of the hand to produce a spectrum of recognisable movements and physically impossible ones through a **stroboscopic effect**. Interlarding the unaltered video with still frames created staccato articulations, while increasing the play speed without additional still frames generated fluid, legato effects.

The realisation that *Treatise* could inform the approach to editing rather than guide the choreography was a positive step. Turning my newly focussed attention back to the score revealed a vivid contrast between the flowing lines in the middle of page 35 and intersecting angular shapes on the left, which I began to interpret as contrasts between smooth and arrested motion. Rather than repeat my previous mistakes with improvised movement I returned to exploring *Treatise* through sound in 'the uniqueness of the moment' (Nyman, 2009, p. 9) using my main instrument, the electric guitar. My sonic improvisations revealed heavy string bending and swelling sounds generated by the slow and truncated releasing of pre-bent strings with staccato articulation preventing a reiteration of initial pitches. My improvisations based on page 35 revealed a concept of ebb and flow which was applied to editing techniques rather than the composition of hand footage. Creating a representation of the page using video editing techniques was not my intention as I wanted to remain faithful in allowing myself to discover new possibilities through the score.

Maintaining a contextual consistency was essential (Nyman, 2009) as I attempted to translate or visualise *Treatise* through my sonic improvisations into a temporal visual dimension (Fuxjäger, 2012), as reflected in visual music practice: 'For the visual artist, composition is "the arrangement of elements and characteristics within a defined area . . . a grouping of related components that make sense together . . . balanced by an overall appearance of continuity"' (Bowers 1999, as cited in Evans, 2005, pp. 12-13).

Creating the Footage

My struggles with improvising in front of the camera pushed me to choreograph my movements prior to recording. The concept of ebb and flow penetrated my approach to choreography through Evans' (2005) discussion of montage in which he confirms Eisenstein's (1949) theory that simple metres, such as 3/4, work well with metric montage. My previous research into [ludomusicology](#) connected the use of a 3/4 metre to a cinematic trope: underwater narratives were frequently accompanied by a waltz-like feel which has since permeated into many strata of popular culture, including video games (Fox, 2016). Using a tempo of 60 beats per minute alluded to a [resting heart rate](#) and provided a comfortable tempo for performance.

Taking some inspiration from the hand positions seen in Rainer's *Hand Movie* I choreographed a sequence of movements which had a natural 'accent of some visual dimension' (Evans, 2005, p. 19). Action was confined to the first beat of the bar and featured movements known to living flesh (Gaffney, 2015): the extension, flexion and separation of the fingers. The accent was provided by pronation and supination of the forearm, positioned at the beginning and mid-way points of the overall sequence, each time prepared by a lengthening of the bar and a quickening of the rhythm. This created a 30-second cell that could be looped in a similar approach to the [accumulative form used in *Portals*](#).

The flowing line of page 35 was interpreted as a legato waltz-like feel, fluctuating as it meandered across the page, while angular lines were interpreted as interrupting the flow to produce staccato articulation and disturb the pulse. The sequence of hand shapes remained intact but the removal and elongation of frames, as influenced by undercurrents or eddies, had a staccato effect on the movements. Building on my experience with *Portals* I choreographed a video score to ensure a strong performance in front of the camera. The video below shows the original score which aided my performance, composed using still images.

Using a score drastically simplified my performance for the camera and resulted in footage of a higher quality with a clear intention.

Structure and Form

The 30-second loop consisted of two distinct parts, each five-bars in length, separated by the natural twisting of the forearm: the first half of the sequence, choreographed for the dorsal side of the hand, consisted of four bars with a $3/4$ metre and one bar with a $5/4$ metre. The second half, choreographed for the palm of the hand, consisted of four bars of $3/4$ and one bar of $4/4$. The changes in metre functioned to prepare and enhance the upcoming accent and subsequent repetition of the loop.

Working with an approach similar to **American avant-garde structuralist cinema**, in which the shape of the film is of most importance (de Bruyn, 2013; Mollaghan, 2015), was my intention for *Syncretism*. As the piece ebbed towards its conclusion the imagery retained its sequential identity but the pulse and depiction of natural movements were gradually eroded through cutting and insertion of still frames. Large-scale structure was directly informed by page 35 itself, working from right to left, while the footage of hands were informed by visual music theory and my sonic improvisations.

As part of the seminar presentation I prepared **some notes and a diagram** of my approach to page 35 which may provide further insight on the construction of the piece.

Influences and Critical Engagement

The variety of approaches in the composition of *Syncretism* were **reflected in the choice of name**. Although these influences were vital in its construction they also created the problem of positioning the work within a larger cultural framework: approaches from video art

and dancefilm were combined with a practical concern associated with visual music, with structural factors and choices informed through musical improvisation practice. Roberts' (2012) illuminative *Notes on Filming Dance* were reached through his collaborative dancefilm *Hands*, which introduced the presentation of rhythm through bodily motion. I connected Roberts' (2012) consideration of rhythm in video with Eisenstein's (1949) concepts of montage, reached through Evans' (2005) explanation of visual music. I feel as though I composed *Syncretism* from a position informed by sound through improvisation but did not intend the piece to be considered as music or to produce non-cochlear sound.

Reading around visual music revealed Eisenstein's (1949) methods of montage. Although the use of montage in visual music had a direct influence on the portfolio I did not intend to compose pieces of visual music. *Syncretism* was my first attempt to amalgamate several external influences which themselves fuse non-representational visual and sonic elements. A 'deterritorialization of the body' (Brannigan, 2011, p. 44) through Balázs' (2010) theory of the close-up shot to expose 'dance-like qualities of micro-movements' (Brannigan, 2011, p. 46) and the application of video art theory through the language of video editing (Eisenstein, 1949; Belazs, 2010) were intended to focus viewer attention to the medium itself and generate 'rhythm as an intersection of pulses, both tangible and intangible, on screen' (Roberts, 2012, p. 107).

That being said, similarities between my approach and that of a visual musician may serve to reveal a thought process rather than an attempt to align the work. Mollaghan (2015) connects visual music with absolute music and film through their non-representational intentions, claiming that visual music is an inherently hybrid art that 'requires the characteristics of at least two disciplines, one of which must be musical in nature and one that is primarily visual in order to be classified as visual music' (Mollaghan, 2015, p. 6). Ox and Keefer's (2008) curatorial work also indicates several approaches to defining a work as 'visual music'. For example, my approach to *Syncretism* through Cardew's *Treatise* could be considered to be 'a visualization of music which is the translation of a specific musical composition (or sound) into a visual language, with the original syntax being emulated in the new visual rendition' (Ox & Keefer,

2008, Defining Visual Music section). However, *Syncretism* was not a direct attempt at creating a representation of the score or the sounds which emerged from my sonic improvisations.

Furthermore, the use of the close-up shot to amplify the motion of the body (Benjamin, 2005; Koupil & Vícha, 2011) through micro-choreographies (Brannigan, 2011) align my work with dancefilm and video art. These aesthetic decisions were based on the desire to continue to work with video and the dexterity of a performing hand throughout the portfolio.

The application of bodily motion to visually express musical scores is not a new idea or approach as exploring musical parameter through the moving image may align my working process with the experimental films of **Fischinger**, recognised as a highly influential filmmaker in the history of visual music (Keefer, 2015; (Mollaghan, 2015). Whereas visual music and experimental film often feature abstract imagery in the work, *Syncretism* directly employs mimetic imagery as a way of drawing attention to the processes imposed upon the images.

As previously discussed, the image of a **disembodied hand** on screen brings with it the **potential for codification of meaning and language**. This potentially problematic issue could unintentionally engage the viewer with a search for meaning in or through the images of the hand, rather than hunting for structure and formation within a temporal perspective (Snyder, 2001).

Vostell and **Paik**'s purposeful violation of the cultural and social concepts which dominated the screen in the 1960s (Hornbacher, 1985; Hanhardt, 1990; Meigh-Andrews, 2014), coupled with the presentation of *Syncretism* in a gallery space, may enable a temporary suspension of an audience's cultural associations with the screen, such as a **classical narrative structure** (Garro, 2011). However, as a silent film there may be issues relating to viewer engagement and concentration. As a short piece it would be presented in a loop, but as the viewer is free to roam the gallery space there is a high possibility of entering into the work mid-way through. This is a common practice for many video art installations (Meigh-Andrews, 2014) but also creates another issue: as

Syncretism is physically silent noises from the gallery space may intrude on the perception of the piece, altering the experience. Although this is more of a concern for *Étude* and *Apprentice*, as these pieces were composed with the overt intention of conjuring private or imagined sound for the listener, environmental sound may still be a factor for *Syncretism*.

Composing *Étude*

My original intention for *Étude* was to grapple with Eisenstein's (1949) *method of rhythmic montage* using silent footage of a guitar performance. I intended to demonstrate and bring attention to the refined physical movements of *traditional Western classical guitar technique* as my primary visual material. The live action would be choreographed through a composition of harmonic and melodic sequences using conventional five-line staff and recorded through several camera angles to ensure that 'the content within the frame is a factor possessing equal rights to consideration' (Eisenstein, 1949, p. 73). Close-up shots would isolate phrases within certain geographical points of the instrument, while long shots would reveal both hands in the same image. Careful editing and composition of the footage from different angles would gradually reveal each constituent part of the phrase, starting with an indication of rhythm in the picking hand before moving onto aspects of the fretting hand, until all of the performative elements of the piece were presented. Panning and zooming effects would have been used to gradually combine rhythmic elements from each hand into the same image. Examples of working with this intention can be seen in the *drafts and workings of Étude*.

The Odessa Steps scene in *Battleship Potemkin* demonstrates how Eisenstein prioritised movement within the image over the metric cutting as 'the rhythmic drum of the soldiers' feet as they descend the steps violates all metrical demands' (Eisenstein, 1949, p. 74).

Étude was intended to be the second piece in the portfolio but the research and composition was temporarily postponed to focus on a piece for a seminar as explained in the *discussion of Syncretism*.

Syncretism was heavily influenced by Eisenstein's (1949) concept of metric montage and rhythm on screen within video art, experimental film, dancefilm and visual music (Eisenstein, 1949; Evans, 2005; Ox & Keefer, 2008; Belazs, 2010; Brannigan, 2011; Garro, 2011; Roberts, 2012; de Bruyn, 2013; Meigh-Andrews, 2014; Mollaghan, 2015). This resulted in a slight change to my aim when returning to compose *Étude*. My initial premise of composing a video piece using multiple camera angles and Eisenstein's (1949) method of rhythmic montage, as revealed through Evans' (2005) discussion of the foundations of visual music, was altered to advance further exploration of metric montage through the use of interventional video editing techniques at the compositional level. I was concerned that my initial concept of combining multiple camera angles and panning effects would lead to a video commentary about a piece, rather than creating a piece itself.

Although I altered the method of montage in favour of a metric approach, a central design philosophy remained: *Étude* was to appropriate the highly developed intentional movements of the hand engaged in particular instrumental activity, choreographed through a piece of music notated on five-line staff. I attempted to create a narrative throughout the piece to reinforce the tireless, dedicated and repetitious nature of labour, work and action (Arendt, 1998), particularly within musical practice. Arnold's experimental films were the key influencing factor in my continued research into interventional editing techniques, methods of montage and approach to narrative. These factors prompted an attempt to relocate the notion of rhythm within bodily movement and video beyond the confines of metre and pulse associated with montage in visual music (Evans, 2005) while assimilating the amplification of micro-movements of the body through the close-up in dancefilm (Brannigan, 2011) into a form of video composition which attempted to generate *non-cochlear sound*.

Further research into experimental film, dancefilm and video art revealed De Bemel's *Scrub Solo Series* in which images of a dancer are captured on *Super 8 film*, digitised and altered to distort and modify the flow of natural movements of the body (Brannigan, 2011).

Combining metric montage, video art theory and dancefilm theory

with musical composition produced a piece in which recognisable movements of the body were deconstructed through smooth reversal looping, hard cutting and rapid repetition of images to create new movements which cannot exist beyond the video image, akin to Arnold's interventional approach (Cummings, 2012). Engaging with the mechanical properties of video editing was also an attempt to engage with an approach to video art similar to Paik, Vasulka and Vostell who asserted that technology was capable of creating a new visual language from the resources of cosmopolitan culture (Furlong, 1985; Hanhardt, 1990; Wooster, 1990).

Creating high-quality footage was imperative if I was to successfully blend my interpretation of Arnold and De Bemels' approaches to the body and film with metric montage due to the short nature of the loops and repetitions to be used. Generous lighting, a carefully considered camera angle and a high frame rate were essential and important aspects which demanded careful planning and a deal of trial and error, as did the performance itself.

Creating the Footage

Creating a rhythmic montage would have required shooting from various angles using a single camera, ruling out post-processing effects due to issues with lighting continuity between shots. Instead, I used heavy black sheeting in my trials with rhythmic montage, resulting in a far superior visual outcome than my trials with green screen and chroma keying. Although the approach for composition ultimately moved away from rhythmic montage, eliminating the need for multiple angles and types of shot, I continued to use the black screen as it dramatically reduced the number of shadows in my limited performance space and allowed me to focus on lighting the subject rather than the subject and the screen.

Using close-up shots of the picking hand focused the work onto the rhythm technique of the instrument and avoided the direct representation of pitch, although allusions to pitch may emerge through the articulations across varying strings. My continued use of

the close-up shot unified *Étude* with *Syncretism* and *Portals* through the amplification of the micro-choreographies in dancefilm (Brannigan, 2011).

Composing small cells using conventional five-line staff notation provided an ideal initial method for choreographing the movements for screen but I eventually opted for performing pieces from my familiar performance repertoire. My experience and familiarity with the repertoire enabled me to concentrate on the action of performing while observing a monitor to avoid reflection of the intense light source from the surface of the instrument.

A passage from **Bach's Cello Suite BWV1007, Prelude** arranged for guitar, delivered aspects of polyphony and various degrees of movement between strings in the picking hand. The entirety of *Étude* was composed using an economy of material from only one bar of Bach's *Prelude* which created approximately three seconds of footage.

Structure and Form

Although a narrative arc may not be essential for a piece attempting to generate non-cochlear sound I created narrative in an attempt to reflect on the private and somewhat secretive process of rehearsal and preparation for live musical performance (Arendt, 1998; Godlovitch, 1998; Krathwohl, 2002). I was keen to try and exploit the **three-act structure** associated with conventional televisual and **cinematic story-based narrative** to expose the meaning within the piece (Klein, 1990; Hyde, 2012; Westgeest, 2016), conceiving *Étude* as a projection piece for the concert hall.

Considering how I would work with the three-act structure associated with conventional cinematic story-based narrative brought me to consider the large-scale 'tonal-polarity model' (Caplin, 1998, p. 195) of **classical sonata form**, the concept of **counterpoint** with digital imagery (Evans, 1992) and consonance and dissonance in visual music (Alves, 2005; Alves 2012). Structure was guided by

loosely relating clips which displayed different physical qualities, such as 'buzzing', 'snapping' and 'fluid' motions, to notions of functional harmony, resulting in an exposition which would lay out 'two contrasting tonal regions' (Caplin, 1998, p. 195), seen at 00:00-2:52 and 2:53-5:09. Structural dissonance was achieved through an increase in tempo and a slightly more aggressive approach to invasive cutting of footage, interlarded with almost static and jittering movements, seen at 5:10-7:26. A brief recapitulation at 7:27-7:48 restated the first region of the exposition to close the piece following a frenetic development. Making a loose correlation with classical sonata form allowed me to perceive a method of organising the materials into logical sequences within sections in a bid to enhance the sense of repetition in the larger structural scheme which was present at the micro level.

My treatment and approach to video was immediately established at the beginning of the piece through an abstraction of an 'accent of some visual dimension' (Evans, 2005, p. 19), a device which was used to create the suggestion of metre in *Syncretism*. A 'buzzing' effect was created by cutting into the footage to isolate a few frames into a clip which could be copied and repeated using the same play direction. Applying this approach to different points within the footage created the 'buzzing' effect along several positions of the filmed trajectory of the hand. These were also assembled into new sequences to create phrases which presented a 'snapping motion'. Ends of phrases were indicated by 'fluid' rocking motions which juxtaposed the sequences of 'buzzing' and 'snapping', achieved by constructing a clip of several frames which would then be seamlessly woven with a reversal of the same clip and looped. The speed of the 'buzzing', 'snapping' and 'fluid' motions were easily manipulated by altering the play speed of the loop or by increasing and decreasing the number of frames within each clip. These were fundamental techniques I had first developed in *Syncretism* by removing and lengthening frames to create static or arrested movement and **stroboscopic effects**.

Critical Engagement

Étude may fail to conjure any form of imagined sound as the images may be too complex (Berger, 2002; Guttman, Gilroy, & Blake, 2005; McAuley & Henry, 2010) and the formation of movement may lack proper reference to established cultural systems or recognised forms of communication (Argyle, 1988; Handhardt, 1990; Gordon, 1994; Godøy & Leman, 2010; Ben-Tal, 2012). However, through the composition of *Étude* I discovered research into the **perception of sensations and cross-modal perception** which was applied to the composition of my fourth piece, *Apprentice*.

Gordon's (1994) assertions on the audiation of a musical score suggest that the ability to conjure an imagined sound from a notated score alone is bound by an individual's understanding of the notational system and is a task which requires purposeful engagement. It may therefore be unfortunate that the 'language of collage, in which strategies of image processing and recombination evoke a new visual language from the multitextual resources of international culture' (Hanhardt, 1990, p. 79) could be insufficient stimulus for *Étude* to generate non-cochlear or imagined sound (Furlong, 1985; Hanhardt, 1990; Wooster, 1990). Schnebel's work *nostalgie [auch: visible music III]*, in which a solo performer conducts an imaginary orchestra, operates within a specific social or cultural system of bodily communication (Argyle, 1988; Godøy & Leman, 2010; Ben-Tal, 2012) and therefore calls on a referential system for a viewer to connect to. An appropriate form of bodily communication may be lacking with *Étude* as the interventional editing techniques distort the reference to Western guitar techniques in order to create new movements. However, dance has been reported to produce similar delineations of temporal stimulus when compared with music through various combinations, including dance-only visual stimulus (Krumhansl & Schenck, 1997). As such, it remains unclear whether *Étude* would be capable of generating non-cochlear or imagined sound. Public presentation of the piece may provide an avenue for feedback and further information relating to the generation of non-cochlear or imagined sound through the video piece.

Based on my research into cross-modal perception it was clear that several experiments engaged with flashing lights and sound against

a contrasting negative space (Berger, 2002; Guttman, Gilroy, & Blake, 2005; McAuley & Henry, 2010). Although the research was designed to create an optimal condition to facilitate cross-modal interactions it may be used to gauge successful generation for my own practice. Based on this research it could be concluded that *Étude* may fail to conjure a non-cochlear sound as the stimulus consisted of a complex moving image which may engage the viewer in a search for **meaning within the imagery**.

My intention for *Étude* was not to create or replicate a psychological experiment but to converge several lines of enquiry into an artistic practice which may raise questions or concerns for the viewer and composer alike. The depiction of a hand and a guitar, along with hard cutting and fast repetition of images, came from a desire to communicate a musician's deliberate decision to dedicate time and energy into developing instrumental skill and technique. *Étude* not only grappled with and brought attention to the presence of video editing but also commented upon the focussed and repetitious nature of work and action (Arendt, 1998): the linear narrative was constructed through a lengthening of only a few seconds of footage with heavy amounts of repetition creating new movements (Arnold & MacDonald, 1994).

Étude was composed as a piece for the concert hall as I considered that the inclusion of a physically silent piece within a program of physically sounding pieces may encourage an audience to engage with the search for sound. The task may require purposeful attention and mental focus which could provide the quality of experience needed to engage with the piece (Csikszentmihalyi, 1997; McAuley & Henry, 2010). Furthermore, the traditional layout of a concert hall reflects that of the cinema and may reinforce the culturally explicit notion of a classical cinematic narrative and associations with the screen to expose *Étude*'s narrative arc (Klein, 1990; Westgeest, 2016). However, the hunt for sound may destroy the narrative in a pleasing, yet problematic, reversal of the traditional role of sound from cinema's infancy (Wierzbicki, 2009). **Sheen** and **Hill**'s approach towards cinematography in *Hand Film* contrasts that of *Étude* through a non-linear narrative, with manual labour and a dissolution of human identity made clear through gesture, repetition and disembodiment.

My compositional practice with *Étude* can be partially aligned with **Fluxus** through the use of technology to subvert the original content and linear narrative of the video and through the intention to compose a physically silent piece for the concert hall, akin to Vostell's use of film for the art gallery (Hanhardt, 1990; Arnold & MacDonald, 1994; Meigh-Andrews, 2014). Some similarities also exist between the practice of visual music, electroacoustic music and my own in the use of technology to push around, cut and splice video and sound materials to create musical form (Evans, 2005; Garro, 2011; Hyde, 2012). Although the stimulus was visual I would assert that *Étude* contained musical qualities as I worked as if composing a piece of music. However, I acknowledge that it may fall short in producing non-cochlear sound.

Composing *Apprentice*

My intention for *Apprentice* was to compose a piece of music using video by liquifying the essential strands which had been uncovered through the composition of previous pieces, rather than composing a video which represented musical form and rhythm. I wanted to compose a trio for guitar, clarinet and piano which called on some of the research into **cross-modal perception** to generate **non-cochlear sound**.

I was aware that the notion of a video as a piece of music may be somewhat controversial and problematic for a viewer but I kept in mind a discussion of sound art and sculpture: 'an avenue of artistic practice does not depend on the exigencies of material. If the sculptor turns to materials never before employed in the production of sculpture, the right to call the work sculpture is not forfeited' (Kim-Cohen, 2009, p. 152). Inspiration and encouragement also came from **Craig-Martin's *An Oak Tree***, which was based on the concept of **transubstantiation** and transformative vision and drew on **Duchamp's *readymade*** (Manchester, 2002). Furthermore, **Turrell** has discussed light as a material in relation to his series of **Cross-Corner Projections** (King, 2002) which seem to be sculptural works of light

that hang in mid-air (Adcock, 1990). Turrell used light to create 'perceptual volumes' (Adcock, 1990, p. 36) rooted in the perceptual effects of space on light and light on space which also hark to a minimal and readymade aesthetic (Adcock, 1990).

Cage's *4'33"* showed that 'silence is not the absence of sound but the beginning of listening' (Voegelin, 2010, p. 83), a concept which resonated with me when composing *Apprentice* as I attempted to shift, through the absence of physical sound, attention onto the perception of the image.

As I was attempting to create non-cochlear polyphony through the visual domain on a single screen I wanted to avoid pictorial or instrumental hierarchy. Considering the digital space through a perspective informed by Pollock's approach to *all-over space* was useful in helping me to conceive each hand as having equal importance and significance within the organised whole. I was confident that *Apprentice* should not be concerned with the trajectories or movements of the hand as *Syncretism* and *Étude* had covered this ground already and could be aligned, in retrospect, with research into visual timing of dance-like movements and auditory rhythm perception (Su & Salazar-López, 2016). Generating rhythm using the binary state of pixels (on/off) would align the piece more closely with research which concluded that a visual stimulus of flashing light may be encoded as auditory, 'resulting in the experience of "hearing" a visual temporal structure' (Guttman, Gilroy & Blake, 2005, p. 234) although it may not be automatic (McAuley & Henry, 2010). Using static hand shapes devoid of transitional movements removed conflicting visual information, leaving only the timed flashing images of the hand. I was keen to compose a polyphonic work to engage with my reading into *cross-modal perception* in an artistic and musical way rather than focussing on simplified, single or uniform images in a pseudo-scientific approach or response to the existing research (Rileigh & Odom, 1972; Guttman, Gilroy & Blake, 2005; McAuley & Henry, 2010).

Two of Nauman's pieces, the bronze installation sculpture *Fifteen Pairs of Hands* and the audiovisual installation *For Children/For Beginners*, capture the motions of hands: the bronze enables a prolonged observation of appendages seemingly engaged in

transitory and expressive motions through physical three-dimensional space, while the audiovisual work also demonstrates motility and dexterity of the hand through a real-time two-dimensional plane. I was intrigued by the logical organisation and the clarity of form observed within each piece. A high degree of repetition is present within *Fifteen Pairs of Hands* as each individual within the pair echoes the other as if a shadow, reflection or engaged in dialogue. The methodical arrangement of finger combinations and audio narrative within *For Children/For Beginners* provides an elegant delivery of all permutations of the digits, reinforced with a vocal narrative and an even tempo. I attempted to apply the ideas of prolonged investigation and logical organisation to rhythm within *Apprentice* by employing a cyclical structure. I wanted to present a limited number of rhythmic figures across each instrument with rotations between instruments providing alternate perspectives.

Structure and Form

As the rest of the portfolio had been composed mostly using intuitive methods I wanted to try composing *Apprentice* using a generative process. Many of my teachers, mentors and fellow student composers used procedural methods to control and generate form and musical parameters and I wanted to reflect on this in my final piece. Up to composing *Apprentice* I had mainly relied on my intuition to guide, organise and make alterations to musical and visual materials during the act of composition. Working with a process was intended to broaden my experiences with composition by attempting to control the trajectory and direction of the piece prior to manipulating any of the constituent elements during the process of arrangement.

I decided that each instrument would have a limited palette of three hand shapes, each entering the piece through a gradual and rotational process. The rotational process consisted of three rhythmic phrases of approximately equal length which passed through each instrument within an immediate temporal framework. The rotation of phrases through each instrument created a cycle

which allowed for the addition of a modifier to control the gradual entry of each new hand shape.

To begin each instrument performed one of the three rhythmic phrases which, when completed, were transferred onto the adjacent instrument. The rotation was continued until all combinations of phrase and instrumentation had been realised, creating a cycle. The rotational process would recommence following each cycle with the addition of a modifier to affect the hand shape attached to the first rhythmic phrase. As the modifier was bound to a phrase it would pass between each instrument as part of the phrase, positively affecting the hand shape for each instrument. With each new cycle the modifier continued to establish a new hand shape until all three shapes had been presented on each instrument.

I composed the rhythmic phrases directly within [Sony Vegas Pro](#) using a simple graphic. Working directly in the program allowed me to create the three rhythmic phrases as templates which could then be applied to any imagery required. Composing three rhythms with very different properties was intended to create constant movement and interest within the total space and are shown in the video playlist below which uses the simple graphic:

The process was successful in organising and presenting rhythm and visual imagery but the resulting piece fell short of my expectations. This presented an opportunity to build on my already established process. I realised that it may be possible to expand the piece beyond the expectation and conventions which the process established from the start of the piece while maintaining the 'transactional rapport' (Eco, 1989, p. 71) between the work and the viewer. This was achieved by retaining the identity of the rhythmic phrases but altering the entry of hand shapes using an [intuitive strategy](#). Preservation of the already established rhythmic and cyclical conventions allowed for flexibility within the entry of the arguably more versatile hand shapes.

Critical Engagement

Apprentice may not be immediately recognised as a piece of music by a viewer who does not possess musical training or experience as music is more conventionally presented using the medium of sound. However, it is hoped that the musical attributes of the visual imagery will be strong enough to be recognised by an engaged audience. If this were achieved the connotations of instrumentation may also reinforce a sense of sound. However, a viewer may be required to undergo an almost complete submission to and acceptance of the rules which govern *Apprentice*. The reference to musical instruments through hand shapes would require a degree of experience and knowledge of instrumentation to fully access the piece, as well as an awareness and submission to the perceptual devices which attempt to establish cross-modal perceptions which may be reliant on viewer compliance (McAuley & Henry, 2010). The continued absence of an audio track to accompany the video was a response to Wilfred and Brakhage's visual music practice in which the presence of sound was believed to distract from the temporal art form (Moritz, 1986; Fuxjäger, 2012) and may directly benefit video pieces which attempt to conjure non-cochlear sound.

Integral to each piece in the portfolio was the imagery of hands which functioned to demonstrate technique, as in the case of *Portals* and *Étude*, or act as a lens through which the presence of video editing was made explicit. *Syncretism* was the only piece which did not attempt to make a connection between the hand and a particular musical instrument, revealing a valid compositional approach to imagery devoid of a connection to instrumentation. While *Portals* was composed to be a score and *Étude* designed to bring attention to specific elements of Western classical guitar technique, neither piece needed to feature images of the instrument. For example, applying the exaggerated motions of air guitar to *Étude* may have provided an alternative approach to visual material which may also have been applied to the violin for the video score *Portals*, producing a very different type of score without sacrificing identity. *Apprentice* was successful at replacing direct images of instrumentation with associated representational imagery through the hands themselves.

Conversely, it could be argued that *Apprentice* is too overt in its

musicality as a viewer may easily recognise the representation of instrumentation in the hand shapes. Depicting instrumentation in the hand may provide little resistance for a viewer whereas images of the hand in *Syncretism* may have a higher resistance as they did not depict musical action. It would be possible to subject images of hands which do not reference instrumentation to the same interventional video editing strategies and structural processes used in *Apprentice* but may require a higher degree of investment from a viewer. The reference to musical instruments and structuring in *Apprentice* may also allow for an interpretation of the video as a score for performance. Although *Apprentice* was not intended to be a score analysis and consideration of the piece may prove useful if I were to make further attempts at composing video scores.

The use of an all-over approach to screen space was an attempt to create polyphony and maintain an equal balance and hierarchy between instrumentation. It may have been more effective to present the polyphonic piece as a **trptych** on one wall, or spread the piece over several walls to fix single instruments within the physical space. I will likely compose **polyptych** pieces in the future, using multiple screens on the same or opposing walls of a gallery space, to which I may consider *Apprentice* as the progenitor. I originally connected polyphony with polyptych through video art, specifically **Bill Viola's** approach which balances a traditional form of presentation with notions of spirituality for the contemporary viewer (Westgeest, 2016).

If cross-modal interactions are capable of producing non-cochlear sound it does not strictly follow that polyphony is possible. **Garro** (2011) asserts that polyphony within the visual domain cannot be achieved due to the limitations of visual perception:

‘while we are able to discern the component layers of polyphony, as well as appreciate the resulting ‘gestalt’ of the mix, we do not see a ‘mix’ of different overlapped visual streams: polyorama, as a faithful optical equivalent of polyphony, does not exist’ (Garro, 2011, p. 11).

However, if the rhythmic phrases and hand shapes were unique and strong enough the totality of the visual image may establish a sense of balance as ‘the forces constituting a system compensate one

another' (Arnheim, 1974, as cited in Evans, 1992, p. 14).

As in *Portals*, the simple and repetitive nature of the structural and rhythmic process was intended to reduce viewer memory load (Snyder, 2001) which may enable a deeper engagement with the total visual image rather than a focus on one instrument. However, there is evidence to suggest that recall of visual rhythmic patterns may be weaker than auditory encoding which could mean the rhythmic structures of *Apprentice* were too complex (Rileigh & Odom, 1972; Collier & Logan, 2000; Iversen, Patel, Nicodemus, & Emmorey, 2015). By considering these points future attempts to create a visual polyphony may look towards engaging with peripheral vision by surrounding the viewer with room-sized displays and somewhat simplified rhythms. However, I acknowledge and accept that achieving polyphony through visual stimuli and cross-modal interaction may provide many further challenges.

Footage quality and stability of the image was a particular issue with *Apprentice* due to the increased use of repetition and hard cut-editing. Slight changes in hand position between each shot were amplified by the aggressive cutting and looping, causing severe jumping of the image which was reduced but not eliminated in post-production. Post-production **colour grading** reduced inconsistencies with lighting but both issues could be avoided by investing in professional lighting equipment, filming in a larger space and engineering a **jig** to support the body throughout filming to reduce performer fatigue.

Finally, I was aware that there may have been a risk of losing artistic and musical direction by assuming a pseudo-scientific approach through research into the perception of sensations. Although it would no doubt be vital to engage with further research in order to create pieces which generate non-cochlear sound through cross-modal interaction and perception, the integrity of the compositions would be my priority.

Completed Pieces: *Portals*

Portals was the only piece to be composed with the intention of the video being a score. As the video was intended to be a score for public concert it contains no sound file. The video score would accompany a performer's live interpretation of the piece in concert, projected for the audience to create an audiovisual experience.

This page contains the original silent video score as well as a video which includes the score and a sonic interpretation in concert by [Kanno](#). The videos contain flashing images

The video below shows the score for *Portals* with [performance notes](#) as a separate file. There is no sound file as the video is a score designed to elicit a musical interpretation in a live concert setting.

The video below contains the score for *Portals* along with Kanno's sonic interpretation which was performed in concert at the [University of Huddersfield](#) on February 28, 2016.

Drafts and Workings for *Portals*

The playlist below shows a selection of the draft videos created during the composition of *Portals*. The drafts have been included to offer a demonstration of my working practice.

Please also feel free to view my [handwritten notes, doodles, scribbles and workings](#) if you wish to see how I collected and organised my thoughts.

Completed Pieces: *Syncretism*

Syncretism was the first piece in the portfolio to engage with the concept of video composition without the intention of creating a score. The composition of *Syncretism* was informed partly through my sonic interpretations and improvisations of page 35 from Cardew's *Treatise* and Eisenstein's (1949) concept of **metric montage**.

The original video material was first generated by choreographing and recording movements of my hand with a waltz-like feel to a strict tempo to create a loop which could then be repeated with the alterations to frame rates. *Syncretism* was not intended to be a score or to facilitate any sort of performative action.

My interest in engaging with **non-cochlear sound** and **cross-modal perception** occurred after the composition of *Syncretism*. A demonstration of *Syncretism* to members of the **CeReNeM** postgraduate community resulted in a discussion and subsequent research into cross-modal perception and non-cochlear sound.

Syncretism was composed as a gallery or exhibition projection piece of at least 72 inches. *Syncretism* is intentionally silent and contains flashing images.

Drafts and Workings for *Syncretism*

The video playlist below shows a selection of the draft videos created during the composing process. These are included to provide the reader with an opportunity to view my approach to composition and demonstrate part of my working practice, if they so wish.

Please also feel free to view my **handwritten notes, doodles, scribbles and workings** if you wish to see how I collected and organised my thoughts.

Completed Pieces: *Étude*

Étude combined elements of video art theory, dancefilm, visual music and music into a video piece in an attempt to generate **non-cochlear sound**. *Étude* was created from only a few seconds of original video footage. Phrase and structure were generated through the repetition and development of small hand movements and micro-choreographies using video editing techniques (Brannigan, 2011). The movements of the hand were sculpted into recognisable and repeatable patterns, some of which being physically impossible for a human hand to perform without **technological intervention**.

Étude was composed as a projection piece for the concert hall which attempts to draw on the culturally explicit notion of a classic cinematic narrative and associations with the screen (Klein, 1990; Westgeest, 2016).

The videos contain flashing images. There are no sound files to accompany the videos.

Drafts and Workings for *Étude*

The video playlist below shows a selection of the draft videos created during the composing process. These are included to provide the reader with an opportunity to view my approach to composition and demonstrate part of my working practice, if they so wish.

Please also feel free to view my **handwritten notes, doodles, scribbles and workings** if you wish to see how I collected and organised my thoughts.

Completed Pieces: *Apprentice*

Apprentice aimed to encompass and build on the experiences gained from composing previous pieces in the portfolio into a piece for multiple hands. *Étude* is a trio for guitar, clarinet and piano. All hand shapes were derived from standard instrumental techniques, with a single instrument housed in a portion of the screen space throughout the piece. Specific instruments were targeted to generate disparate hand shapes and may impact on a **non-cochlear sound** if **cross-modal perception** was established.

Rhythm was created by applying simple video editing techniques to show or remove the images within a formal structure imposed onto composition prior to any arrangement. Engaging with a pre-determined form was an attempt at removing the 'blindness of instinct' (Merleau-Ponty, 1962, p. 90) from the act of composition. Rhythm exists in three approximately equal parts, played by each instrument in turn before cycling through each instrument. A new hand shape emerges after each cycle, tethered to one rhythmic pattern.

The videos contain flashing images. There are no sound files to accompany the videos.

Drafts and Workings for *Apprentice*

The video playlist below shows a selection of the draft videos created during the composing process. These are included to provide the reader with an opportunity to view my approach to composition and demonstrate part of my working practice, if they so wish.

Please also feel free to view my **handwritten notes, doodles, scribbles and workings** if you wish to see how I collected and

organised my thoughts.

Technology and Equipment

Editing found footage and creating my own footage required several different approaches to technology. I did not need to consider lighting and backdrops when working with found footage but post-production effects were essential for all pieces.

A convoluted process involving two separate video editing suites emerged throughout the composition of *Portals*. *Lightworks* had a strong set of digital effects which were used to crop images, create and animate the portals. The automated *key frame* tool reduced animation time significantly by allowing me to record the movement of the portals in real-time: an experience similar to automation of *audio panning*. I also used *ScreenFlow* as a compositor as my experience with the software from composing *Questioner, 1863* enabled quick and easy experimentations with phrase structures. My approach to the composition of *Syncretism* required many individual edits to be made on a frame-by-frame basis so I worked exclusively within *ScreenFlow*. Swapping files between the two suites often interrupted my workflow so following the composition of *Syncretism* I switched to use the more powerful *Sony Vegas Pro* exclusively. I found that *Sony Vegas Pro* operated in a surprisingly similar way to audio editing software which further boosted my productivity: the majority of *Étude* and the entirety of *Apprentice* was composed and arranged using *Sony Vegas Pro*.

Although I had access to the University's audiovisual equipment practical financial considerations led me to use only my own equipment. Although using basic equipment imposed limitations on the pieces, such as *image quality* and fixed *lens types*, I felt compelled to work within the financial and technological means which would persist beyond my time at the University. If I were to tackle further study I would actively engage with more sophisticated technology to achieve specific artistic intentions such as higher frame rates, slow motion and superior image quality.

The Close-Up Shot

Viola's work was the first video art I purposefully encountered. Viola's use of close-up shots, high definition imagery and slow motion footage which appeared to lengthen subtle facial and bodily movements, revealing and enlarging them (Benjamin, 2005), provided immediate stimulation. Visiting an exhibition of Viola's work at the *Yorkshire Sculpture Park* was a highly rewarding experience as I was able to examine *The Return*, *Three Women* and *The Trial*. For his *Transfigurations Series* Viola required different types of technology to create the effect of a human figure passing through an invisible barrier as a metaphor for transformation (Viola, 2015). Although the technology employed in Viola's work was beyond my skill set, the exhibition spurred me to investigate Viola's work further and find pieces in which slow motion was used without transformative technology. The *Quintet of the Astonished* and *Observance* are examples of how Viola created his work to have emotional and spiritual significance (Kidel, 2003; Morgan, 2004; Lilley, 2015). However, my interest was captured by the ways which close-up shots and slow motion can bring the viewer closer to the work through the perception of the amplified physical movements (Benjamin, 2005; Koupil & Vicha, 2011).

The close-up shot is also very well established within mainstream cinema, often used to focus the attention of the viewer and attempt to enhance parts of the narrative (Millerson & Owens, 2008; Dancyger, 2011). The use of the close-up in dancefilm may not be bound to any sort of narrative when it is used to bring 'attention to the performing body and its micro-movements - the smaller detailed movements of the body and its parts' (Brannigan, 2011, p. 43), but it does function in focussing the attention of the viewer. Roberts' *Hands*, De Bemels' *Scrub Solo Series*, Rainer's *Hand Movie* and Hill and Sheen's *Hand Film* make effective use of the close-up shot to frame the action in dancefilm.

The Body and Negative Space

The methodical arrangement of finger combinations and audio narrative presented in Nauman's *For Children/For Beginners* was influential on *Apprentice* as I employed a method of logical organisation to rhythm and structure. Nauman also alluded to instrumental techniques and rehearsal which become apparent through the difficulty of some of the finger combinations featured in *For Children/For Beginners* (Spears, 2010).

Several of Hill's video pieces feature a dark negative space and a recurring theme of the orchestration of the body with a verbal audio track.

Dark negative spaces feature regularly in the video, film and theatre works I have visited, as they do in my own work. I suspended the images of my hands within a void of 'visual silence' (Hyde, 2012, p. 175), just as Viola's figures emerge through darkness from another world (Morgan, 2004) and the spotlight almost eliminates the physical body in Beckett's play *Not I* (Pettifer, n.d). Following the development of *Vantablack* and reading of Kapoor gaining the exclusive right to use the pigment in his work (Delany, 2016) further reinforced the use of dark negative spaces in my own practice. Merleau-Ponty (1962) shows how a dark negative space can amplify the subject:

'Bodily space can be distinguished from external space and envelop its parts instead of spreading them out, because it is the darkness needed in the theatre to show up the performance, the background of somnolence or reserve of vague power against which the gesture and its aim stand out, the zone of not being *in front of which* precise beings, figures and points can come to light' (Merleau-Ponty, 1962, p. 115).

Musical and Conceptual Elements

The origins of video recording have close links to audio recording and tie with early electronic experimental music from Schaeffer, most readily associated with *musique concrète*, and Cage's *Williams Mix* (Meigh-Andrews, 2014). Through composing the portfolio I experienced some of the links between sonic and visual editing myself through the use of video editing software, which I found to have remarkable similarities to audio editing software. Considering that light and sound waves possess similar characteristics it seems logical to work with them in similar ways, something which Fischinger is reported to have commented upon: 'Light is the same as Sound, and Sound is the same as Light. Sound and Light are merely waves of different length. Sound and Light waves tell us something about the inner and outer structure of things' (Moritz, 2004, as cited in Connor, 2011, p. 8).

Each piece in the portfolio was created using an economy of material. Short clips were stretched and manipulated to create larger structures through interventional editing processes and a high degree of repetition. I continued to draw and expand these techniques throughout the portfolio with a significant influence coming from the video work of Arnold and De Bemels. Using an economy of material was initially a practical issue related to performer memory in *Portals*. Providing the performer with various combinations formed from a discrete set of images would be less taxing on the performer's ability for retention and protention, facilitating a performance of the score in real-time (Snyder, 2001). My economical use of material became more of an aesthetic choice rather than a practical necessity for *Syncretism* and *Etude* in which I focussed on presenting the mechanical effects of video editing on the images, which can be aligned with Reich's tape loop pieces, such as *It's Gonna Rain* and *Come Out*.

A return to using an economy of material through practical concerns arose for *Apprentice*. Limiting the number of images used throughout the piece was an attempt to focus viewer attention

towards **non-cochlear sound** through **cross-modal perception**, rather than an identification of visual imagery.

I would like to think of my work as experimental music before considering it as conceptual music or a type of dancefilm or video art. As an undergraduate I enjoyed being consumed by various investigations into experimental and new music at a point in my life where my desire to make music had begun to wain. Studying experimental music showed me that 'music is something your mind does' (Nyman, 1999) and perhaps my recent video work can help me to explore further possibilities for musical composition in the future.

Conclusions

The portfolio of pieces served to illustrate the ways in which I transposed my existing experience and knowledge of sonic composition on to studying the medium of video, leading to explorations into unfamiliar artistic territory. Each piece aimed to build and expand on previous research and compositional practice through an explorative and experimental approach intended to establish a practice of video composition. Although the **initial premise** of de-emphasising the finite lattice of pitch and rhythm (Wishart, 1996) through video scores was unsuccessful, the change of direction towards composing video pieces allowed me to explore fresh territory for my compositional practice.

Applying key pieces of research into the perception of sensations and **cross-modal perception** to the composition of video pieces to conjure **non-cochlear sound** was the apex of my research. However, I acknowledge that the portfolio may not have been extensive enough to fully explore the composition of video pieces which conjure cross-modal perception or summon non-cochlear sound. Following up on the current research project with further exploration into the perception of sensations through continued research and composition may be essential. I intend to compose a series of video pieces to explore simplified and discrete rhythms using a limited number of hand shapes. Each piece will likely use an identical set of rhythmic phrases but feature contrasting visual material: one piece

will aim to represent musical instruments through the hands and another will not. The exploration of disparate visual material within a single and identical rhythmic framework may lead to a taxonomy of visual stimuli. I also intend to enquire whether simplification of visual imagery would enable the viewer to more easily engage with the totality of the image, advancing my investigations into polyphony within the visual domain through cross-modal perception. Whether abstract imagery would function to increase or heighten the likelihood of cross-modal interactions taking place to produce non-cochlear sound would also need to be investigated.

Although further investigation into non-cochlear polyphonic compositions through the visual domain may require working with abstract imagery, the representation of musical instruments through hand shapes as seen in *Apprentice* continues to hold my interest. Studying the way listeners associate changes in musical parameter to imagined motions of a human character may indicate that musical parameters could be related to imagined motions, including a link between the intensity of sound and motion (Eitan & Granot, 2006). Considering the research into sound and imagined motion along with the *motormimetic sketching* (Godøy, Haga & Jensenius, 2006) of *air guitar* may provide other avenues for investigation. Studying aspects of dynamic range and pitch through visual stimuli, which lay beyond the scope of the current project, may be assisted through further research into perception and visualisation of imagined motion.

Locus will remain an important aspect for consideration of future pieces which may be constructed as *polyptychs* or work with peripheral vision, but I may also likely explore the possibilities of composing pieces which exist online. Composing for internet-based digital spaces may allow me to curate my own galleries and exhibitions as separate to, or as an augmentation of, physical gallery spaces and presentations. This may be an important consideration as the pieces for the current portfolio currently exist online but were designed for physical spaces. I hope to learn more about video and musical composition and curation by composing pieces for physical and virtual spaces.

Further Considerations

As the project engaged with existing research into video art, dancefilm, visual music and the perception of sensations it may be important to consider searching for collaborative partners within the disciplines of the arts and psychology. Collaboration may have a positive effect on the efficiency of research and open up fresh avenues of investigation, expanding already established frameworks and understanding.

Establishing a concrete understanding of video capture and lighting would facilitate the composition of future pieces by reducing the need for experimentation. This could be achieved by enrolling in academic courses. The design and construction of a versatile **jig** would also be essential to keep the body steady when filming and improve the quality of the footage.

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Apprentice drafts and experiments playlist

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- <https://www.youtube.com/watch?v=WHgHwX3JCtM&feature=youtu.be>

Étude drafts and experiments playlist

- https://www.youtube.com/watch?v=bTepLIXcOWw&feature=youtu.be&list=PLqD50JcQOOfZbO_qUhfND1H33TRh8KLM6

Experiments with hand movements: prototype pieces

- <https://www.youtube.com/watch?v=QBGROyWzxbw&feature=youtu.be&list=PLqD50JcQOOfZER3Zkq7tktb8WEvM6798c>

Formative work following *Portals*

- <https://www.youtube.com/watch?v=xHor1uVREg0&feature=youtu.be&list=PLqD50JcQOOfYSJYZXGXfsWmrwduwXsxyq>

Gary Hill's *Goats and Sheep*

- <https://vimeo.com/111244710>

Gary Hill's *Wall Piece*

- <https://www.youtube.com/watch?v=bHSEzNZ1OdA&feature=youtu.be>

Jack Sheen and Rowland Hill's *Hand Film*

- <https://vimeo.com/128171585>

James Turrell discussing his work with light and sky spaces

- https://www.youtube.com/watch?v=_BuJpDXkMz8&feature=youtu.be

Jonathan Burrows and Matteo Fargion's *Both Sitting Duet* (extract)

- <https://www.youtube.com/watch?v=HyWwmHrmpxM&feature=youtu.be>

Martin Arnold's *Passage à l'acte* (extract)

- <https://www.youtube.com/watch?v=0jJtSv-o-m4&feature=youtu.be>

Merce Cunningham's *Working Process*

- <https://www.youtube.com/watch?v=zhK3Ep4Hil0&feature=youtu.be>

Nancy Ruffer Workshop - performing *Questioner*, 1863

- <https://www.youtube.com/watch?v=llm7pyryHXw&feature=youtu.be>

Portals

- https://www.youtube.com/watch?v=2fV_3o10kTs&feature=youtu.be

Portals with interpretation by Mieko Kanno

- <https://www.youtube.com/watch?v=nGzZKLtViXc&feature=youtu.be>

Portals drafts and experiments playlist

- <https://www.youtube.com/watch?v=88eMul9DqfQ&feature=youtu.be&list=PLqD50JcQOOofbd6rWtH5m3OND4L1QgDPzx>

Rhythmic cells in *Apprentice*

- https://www.youtube.com/watch?v=6wzPcelNmsc&feature=youtu.be&list=PLqD50JcQOOofZKZRMPItTw_09w3rhM2ijW

Samuel Beckett's *Not I* (extract)

- <https://youtu.be/M4LDwfKxr-M>

Stan Brakhage's *Mothlight*

- <https://www.youtube.com/watch?v=Yt3nDgnC7M8&feature=youtu.be>

Steve Reich discussing his use of tape loops and *It's Gonna Rain*

- <https://www.youtube.com/watch?v=uUTRS0iW7oE&feature=youtu.be>

Syncretism

- https://www.youtube.com/watch?v=C_YF44_A6dQ&feature=youtu.be

Syncretism drafts and experiments playlist

- <https://www.youtube.com/watch?v=1q4ultt2MRE&feature=youtu.be>

Syncretism video score

- <https://www.youtube.com/watch?v=qQ-VCG3IYgw&feature=youtu.be>

The McGurk Effect - extract from *Horizon*, BBC Two

- <https://youtu.be/G-IN8vWm3m0>

Yvonne Rainer's *Hand Movie*

- <https://www.youtube.com/watch?v=CuArqL7r1WQ&feature=youtu.be>