VOLUME 1

MAPPING GESTURES IN THE CREATION OF INTANGIBLE ARTWORKS

PETER ROGER ALSOP

MAPPING GESTURES IN THE CREATION OF INTANGIBLE ARTWORKS

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Declarations

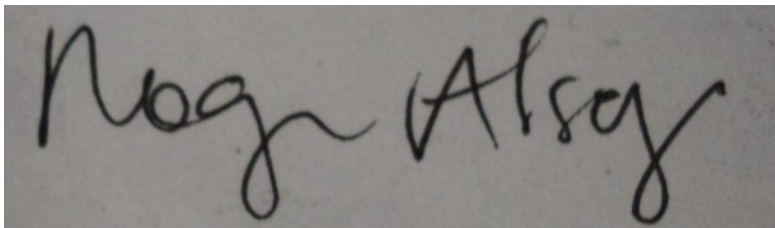All work presented is by me, Peter Roger Alsop, unless acknowledged.

No part of this project has been previously submitted, in whole or in part, to qualify for any other academic award.

All work presented has been carried out since the commencement of the approved research program.

Ingrid Hornung edited the final document for typographical errors.

No ethics approvals were required for the work presented here.

Signed

Peter Roger Alsop

Summary

"Mapping gestures in the creation of intangible artworks" considers that what is normally understood as an artwork, such as a painting or music, is in fact a tangible thing experienced via excitation of the physical senses. It is the perceiver's interpretation of this excitation that creates their unique experience of the object, and this interpretation creates the artwork.

Rather than a linear, single-trajectory interaction from the art-maker to the art-perceiver, "Mapping gestures ..." hypothesises that this relationship is best understood as having the qualities of a Möbius strip, in that the maker and perceiver are engaged in an interaction in which each are simultaneously creator and perceiver.

"Mapping gestures ..." has two parts: the three art-objects, MOTION, SPEECH and VISION, and the accompanying exegesis, which discusses the ideas and processes that informed their development. Its process is to explore the making of these art-objects and the discoveries that that generates. These discoveries in turn influence the process of creating the art-objects, which consequently leads to more discoveries.

MOTION, SPEECH, and VISION are designed to engage the perceiver both physically and mentally, and to represent that engagement through simultaneously showing the result of their physical and their mental interactions with it.

"Mapping gestures in the creation of intangible artworks" coalesces a bricolage of diverse aspects, including: concepts and theories relating to art making and communication, various art works, and art making concepts and processes, into a set of art-objects that overtly, fundamentally, and in essence rely on the interaction and interpretation of the perceiver in order to become artworks.

Acknowledgments

Most importantly, I must thank my wife, Ingrid Hornung, for her unwavering support in the development of this work. Ingrid's conversation, incisive and insightful questions, ability to 'nod and smile' at the right moments, to encourage without over-encouraging, and to help me make real sense of my ideas have been essential here and will be in future. Secondly, I must thank my children, Zoe and Grace, who have graciously put up with 'preoccupied dad' for much of their lives.

This does not diminish the contributions that Marsha Berry has made over the duration of my candidature at RMIT; her insight and rigor have greatly enhanced my capacity as an art maker and researcher, particularly in the middle and later stages of this project's development. I also thank Damian Schofield for his encouraging and insightful contributions in its beginning and final phases.

Operational terms

This list refers to the interpretation of specific terms used in this exegesis.

Art-object - something made or perceived as art that empirically exists. Examples of an art-object include: a painting, text, performance event, music, or a film; it is a pointer to a potential experience in its perceiver[1]. It is "the art product on the way to becoming the artwork" (Innis 2001, p. 24).

Artwork – a dynamic, intangible, ephemeral, internal experience created in the perception and subsequent interpreting of an art-object.

Audio-visual – simultaneously exciting the cochlea and retina through a single system or process.

Computer – an impartial system or storing and manipulating data.

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[1] Having made an art-object, its maker becomes its perceiver, with as much influence over it as any other perceiver.

Gesture – a conscious or unconscious physical, sonic, visual or mental action that requires or engenders a change of state[2].

I – the personal pronoun refers to the researcher/artist (myself)[3]

Mapping – the association or translation of information presented in one form to information presented in a different form

Paradigm – a process though which the perceiver reconciles an art-object to their own understandings, knowledge base(s), and preconceptions.

Perceiver – a person actively engaged in a personal, interaction with an art-object.

Process – a dynamic and fluid approach to arriving at an outcome. Examples include: the gathering of ideas to be expressed through an art-object; the act of making an art-object, such as the development of a performance; and the act of perceiving and interpreting an art-object (done by both maker and perceiver), such as considering an understanding of a performance, and then reconsidering that understanding. A process is something that the maker is in when making the art-object, and the perceiver is in when interacting with it.

Maker – the creator or author of an art-object.

System - an agglomeration of tools used in a process to make, perceive and interpret an art-object. Examples include: a paintbrush and canvas, a piano and an orchestra, placing an artist's statement with an art-object, and an existent, external theoretical frame through which the perceiver interprets an art-object.

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[2] This implies a temporal element in a gesture. While a static art-object such as a painting or sculpture may appear to have no temporal dimension, the perception of it does.

[3] This considers approaches to Qualitative, Ethnographic, Autoethnographic and Practice-based research in acknowledging the fundamental centrality of the researcher in the process of developing relevant understandings and knowledge bases. These approaches acknowledge that the research subject is ever-changing and developing, containing personal paradigms and opinions that are as immediately true as they are transient. (Mateas and Sengers 1999; Goodall 2000; Denzin and Lincoln 2003; Ricci 2003; Duncan 2004; Wainwright and Rapport 2007; Bartleet, 2009; Uotinen, 2011)

Text – the written word.

Presentation

MOTION, SPEECH and VISION are designed to be presented in a gallery or gallery-like situation. It is important that the perceiver be in a private and intimate relationship with the art-objects, and that they be able to interact with them immediately and directly; their interaction with the art-objects should not be interrupted or influenced by any external factors[4].

The image below indicates the positioning of the three required computers in a space (this is not drawn to scale). It shows each computer oriented so that the perceivers are facing away from each other in order that distractions are reduced.

Potential Audience

MOTION, SPEECH, and VISION may be presented in a variety of ways. The arrangement suggested in Figure 1 on page vii; is a suggestion for a small gallery space in which the audience may interact privately and individually with the art-objects. However, it is possible to present these works in different environments and thus to different audiences. For example: the visual and sonic elements may be presented in a wall/screen-based gallery, where the visuals are projected onto a surface with the interpretation interface hidden; or they may become an app for a smartphone, interactive computer 'wallpaper', or as web based multi-user interactive works.

In essence, and in keeping with the ethos of these works and my art making, MOTION, SPEECH, and VISION may be presented to any audience and through any mechanism or process deemed suitable in the moment of presentation, and this cannot, nor should it be, predicted.

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[4] This is discussed further in Presentation, on page 92.

Required technology

A gallery presentation of MOTION, SPEECH and VISION requires three iMac[5] computers less than two years old (from time of writing), one for each object. The video camera tracking the perceiver's movements should be directly above the screen being viewed, so that it is the perceiver that takes up the majority of the camera's view.

The perceiver should listen through closed-back headphones in order to hear the sound spatialization effects inherent in the processes, and to enhance the directly personal and immediate interaction between the perceiver and the art-object, ensuring that the final experience of the process is individual and internalized.

It is possible that other systems may be used; MOTION, SPEECH and VISION have been tested on a MacBook Pro3,1, and a PowerMac G5 Quad (PowerMac 11,2) with an attached iSight camera. In these cases MOTION, SPEECH and VISION has operated successfully.

While it is likely that MOTION, SPEECH and VISION will work on other, recent configurations of Apple computers, no guarantees are made.

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[5] The most recent model with the largest screen possible is preferred.

Figure 1: Potential position of the three computers for the presentation of MOTION, SPEECH, and VISION
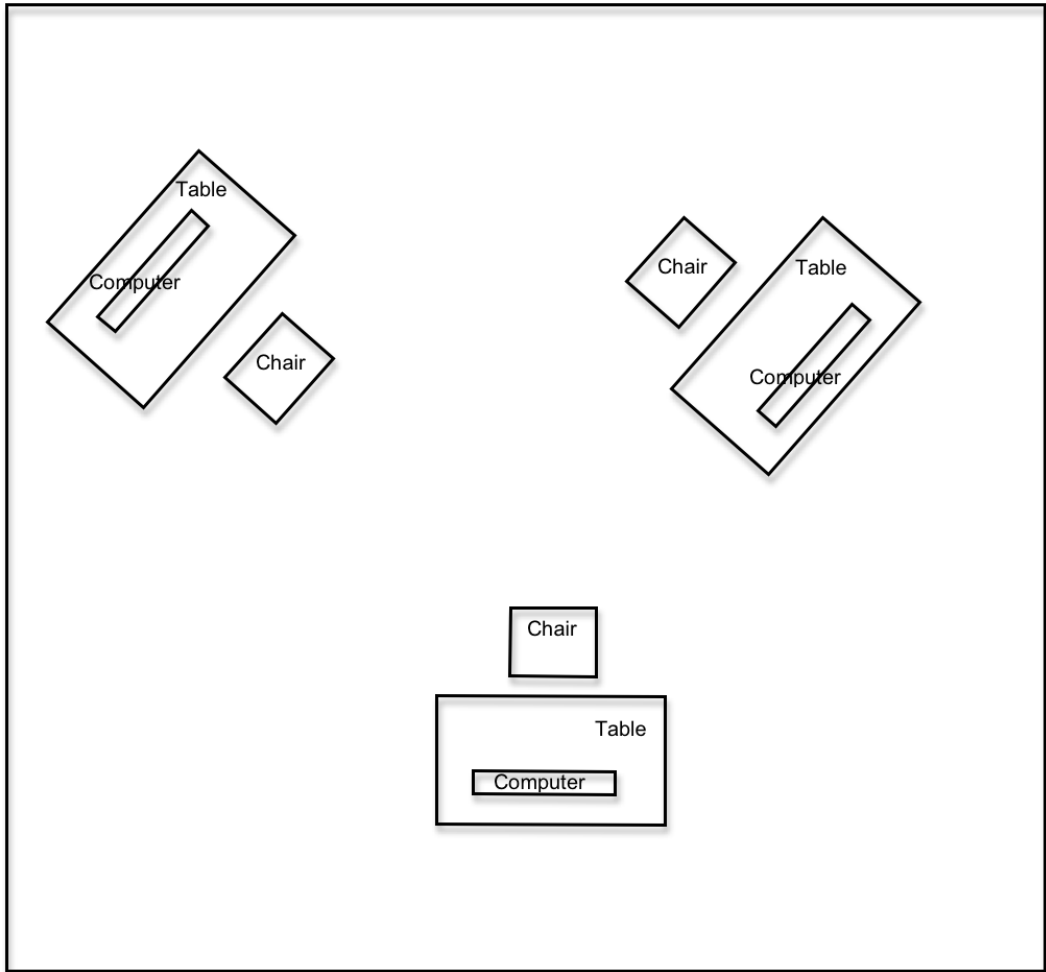
How to interact with MOTION, SPEECH, and VISION (to be included with the presentation)

An artwork is not the object that is perceived; it is the experience that object causes within the perceiver. The artworks being offered here are not MOTION, SPEECH, and VISION; these are simply the objects that allow your experience when you are responding to them, and this experience is the artwork.

There are two ways your interactions form what you perceive when engaging with MOTION, SPEECH, and VISION: through mapping your physical gestures as you are viewing the screen and hearing the sounds; and through mapping your mental gestures through your interaction with the Interpretation interface.

Your interaction causes them to exist. They reflect your unique and ephemeral presence and become your experience of the works.

Conventions

This exegesis was written using Microsoft Word 2008 for Macintosh using Australian spelling according to that program.

'Their' is used in most cases to provide an inclusive and non-gender-specific term, particularly when discussing the perceiver and their role.

The dictionary used for definitions is Dictionary.app, version 2.1.3, supplied with MacOS 10.6.7.

The spelling, punctuation and grammar in quotations are left as in the source.

The Appendices contain additional conceptual or technical discussion when deemed appropriate. When this occurs it is indicated in the body of the exegesis.

Interface design

There are two interfaces for each of the three systems presented here.

- The camera interface, through which the physical gestures of the perceiver in the act of perceiving are captured and re-presented on the computer's screen; this is a very simple interface that requires no effort from the perceiver other than to be within the camera's view. It is through tis interface that MOTION, SPEECH, and VISION interact with their perceiver.
- The Interpretation interface, through which the perceiver can adjust the audio-visual outcomes. I**t is designed to require direct attention to negotiate and to distract the perceiver from the artwork being perceived**. Its purpose is to take the perceiver's attention from the art-object and place it on the act of interpreting the art-object. This interface incorporates text referring to some of the processes and paradigms through which interpretations may be made, including a range of contemporary art styles, and theoretical and personal frames and processes. Images of the interfaces are shown on pages 98, 99, 112, 113, 124, and 125.

Accompanying materials

A single USB drive containing the art-objects MOTION, SPEECH and VISION, this document as a set of .pdf file, and selected .mov files showing some outcomes of MOTION, SPEECH and VISION accompanies this document. These have been tested on the computer systems as outlined in Presentation on page vi, above.

Software used in the development of this project

Max/MSP/Jitter 4.6 and Max5, from Cycling74, is the software used to develop this project. MOTION, SPEECH, and, VISION were created using only patches and objects available in the downloadable version available from cycling74.com.

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Mapping Gestures in the Creation of Intangible Artworks

What is art

All the arts can be seen as a manifestation of one and the same impulse. (Allott 1994. BIOLOGICAL LINKS BETWEEN THE ARTS section, para 1)

Remember that a picture—before being a war horse or a nude woman or an anecdote—is essentially a flat surface covered with colours assembled in a certain order. (Maurice Denis 1890, para. 3)

To express himself the artist must both receive and transmit. (Michel Claura 1999, p. 82)

Art intended as pure experience doesn't exist until someone experiences it, defying ownership, reproduction, sameness. Intangible art could break down the artificial imposition of "culture" and provide a broader audience for a tangible, object art. (Lucy Lippard 1999, p. 178)

… speaking of the music which arises through the activity of both performers and so-called audience … (John Cage, in Perloff 2002, para. 2)

The computer … is a multidimensional, interdisciplinary processing and communication machine. (Joan Truckenbrod 1992. p, 89)

How can we represent this experience in new ways? How can new media allow us to experience the ambiguity, the otherness, the multi-dimensionality of our experience in new ways, thus enriching our lives - for this, this is the real challenge lying before us. (Manovich and Marketou 2002, para. 17)

According to Tolstoy art is

> one of the conditions of human life … one of the means of intercourse between man and man … [It] causes the receiver to enter into a certain kind of relationship both with him who produced, or is producing, the art, and with all those who, simultaneously, previously, or subsequently, receive the same artistic impression. … To evoke in oneself a feeling … then, by means of movements, lines, colours, sounds, or forms expressed in words, so to transmit that feeling that others may experience the same feeling - this is the activity of art. … by means of art [man] transmits his feelings … that other people are infected by these feelings and also experience them. (Maude 1924, pp. 170-173)

This selection of Tolstoy's opinions provides an understanding of what art is. However, art must be expressed through an 'artwork', an object comprised of "movements, lines, colours, sounds, or forms expressed in words", the gestures that infect the "other people", causing the art to reside, like any infection, within them.

Once inside the perceiver, the art-infection mutates according to the influences of its host, the host's environment, and the host's interaction with that environment, taking on the characteristics of each and accommodating their various idiosyncratic paradigms. The objective "movements, lines, colours, sounds, or forms expressed in words" become malleable subjective gestures, adjusting to be as much a reflection of their host as they are of the original object and its maker.

Chapter 1: Introduction to Mapping Gestures Across Art Forms In The Creation of Three Intangible Art Objects

This project has two parts: the three art-objects, MOTION, SPEECH and VISION, and this exegesis, which discusses the ideas and processes that informed their development. Its process is to explore the making of these art-objects and the discoveries that that generates. These discoveries in turn influence the process of creating the art-objects, which consequently leads to more discoveries.

The art-objects/artworks

Many different desires coalesce in my art making. The most fundamental are: the desire to activate and engage the perceiver in the making and experiencing of any artwork; to bridge the ostensibly disparate domains of art making and contexts; and to create a sense of stillness and attention to the moment in the perceiver.

Mapping gestures in the creation of intangible artworks is an attempt to fulfil these desires though the creation of three audio-visual art-objects, MOTION, SPEECH and VISION, and to outline their development through the discussion here. I use the term 'art-object' to emphasise the distinction between the object being perceived and the perceiver's experience of it. I believe this experience to in fact be the artwork.

When perceiving art I have always found that it is the intangible, ineffable experience that resides within me. I have also found that when considering an art-object I focus more on the interpretation or interpreting process, and less on the experience.

MOTION, SPEECH and VISION require the perceiver to be simultaneously in the act of perceiving and interpreting the objects in order that they exist, and this interaction forms the artwork and the experience of it.

Two mechanisms facilitate this: the representation of the perceiver in the act of perceiving the audio-visual outcomes, and the perceiver's interpretation of the art-objects through adjusting various parameters via the computer keyboard and mouse.

The audio-visual outcomes allow the perceiver to take the role of any gallery attendee, passively observing the image and sounds (even though their image and actions are the main ingredient to that outcome). The Interpretation interface requires that the perceiver interact with those outcomes mentally, taking the role of interpreter and witnessing the results of their interpretation. This act is as vital to MOTION, SPEECH and VISION as the act of passive observation.

This process of engaging and disengaging with the art-object promotes the gesture that often occurs when experiencing an artwork; that attention oscillates between the experience of it *per se*, and the interpreting of it.

Background to this project and exegesis

An auto-ethnographic and practice driven approach is taken to the development of this project. Relevant aspects of my history, and the subsequent bricolage that has created, and is creating, my continual development as an arts practitioner, are outlined.

This exegesis aims to outline the philosophical and conceptual bases that have informed the project throughout its conception, development, and resolution. It discusses the diverse influences that combine here, considering specific artworks, theoretical concepts, and systems, and how these mesh to form a foundation for my practice and resulting artworks.

It outlines the approaches used to facilitate the merging and crossing of traditional boundaries inherent in art making and experiencing, using computer technologies. It explores the paradigms through which the audio-visual works were developed, and other influences that led to the creation of the works.

As the focus of this project is the development of artworks and the creation of systems for that end, this exegesis does not attempt to be a comprehensive theoretical or literature based exposition of any of the art forms being considered, nor of areas often considered in the processes of computer based art. It is instead an autoethnographic exposition, in which the artist/researcher and the product of that nexus are discussed.

MOTION, SPEECH and VISION consider the experience of an artwork to be a three-part interaction, involving the maker, art-object, and perceiver equally in an ephemeral, intangible and mutating relationship. These three art-objects are an attempt to highlight this interaction, placing particular emphasis on the interaction of the perceiver in the creation of an artwork and its consequent experience.

This introductory chapter outlines: my personal philosophies and principles; premises that inform the practice; the questions germane to this project; a brief discussion on the three artworks created; and an outline of the exegesis as a whole.

Similarities in artworks

While the objects that result from any creative artistic process are often seen as dissimilar, their causes, and the intellectual and intuitive processes used in creating and realizing those results, can share fundamental similarities.

For example: if we consider Goya's "*Third of May, 1808*", Picasso's "*Guernica*", Penderecki's "*Threnody to the Victims of Hiroshima*" and Jimi Hendrix's "*Star Spangled Banner*", performed at the Woodstock Festival 1969, we perceive objects that are either silent, visible, immediate and immutable, with the transmission media being fluctuating electromagnetic waves and the retina as receptor; or audible, invisible, gradual and mutable with the transmission media being fluctuating air molecules and the cochlea as receptor.

There are also differences in the presentation systems of these objects: for Goya and Picasso's, there is no interpreter but the perceiver, who controls their own perception of the art works; while Penderecki and Hendrix's are subject to and dependent on the presenter's interpretation(s), and therefore their perception is controlled by the presenter in the moment of presentation. However, each is caused by the artist's impulse to bring the horrors of war, as they saw them, into prominence.

While the ostensible differences between these objects are significant, there is also a similarity: each artist uses gestures of line, shape, colour, frequency or timbre that are temporal or static. The perceiver then coalesces these gestures to form their own idiosyncratic interpretation(s) of the maker's intention within their own paradigms.

Artworks themselves materialize the artist's impulse, and allow its transmission. The impulses of Goya and Picasso are transmitted by the deliberate excitation of electromagnetic waves, and Hendrix and Penderecki's impulses are transmitted by the deliberate excitation of air molecules.

These transmissions are encountered in the cochlea as fluctuating air molecules, and/or the retina as fluctuating electromagnetic waves[6]. The perceiver interprets these fluctuations through unconscious chemical or mechanical and electronic actions, the results of which are then unconsciously or consciously interpreted to form the perceiver's experience of the artwork.

This process indicates the agency perceivers have in creating the experience of the artwork. This is because they interpret the chemical, mechanical and electronic input through their own paradigms and processes, and this interpretation then forms their experience of the artwork.

Thus the maker's expression, the art-object, becomes a pointer to a potential experience within the perceiver: the maker can only influence the perceiver's experience. As discussed earlier, here an artwork is considered the intangible, ineffable experience residing in the perceiver as a result of perceiving the art object.

These four works are considered as art-objects, in that they have an existence that can be objectively recognised and acknowledged. The interpretations I have made of them result from my internal experience of them based on the paradigms I hold when perceiving, and remembering, them. I have contextualized and conceptualized them according to my present intentions, so that they reflect and express those as much as they reflect the original intentions of their makers.

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[6] This does not exclude the tactile experiences of any artwork, which may be a function of the artwork or the tactile process for experiencing it. Examples are those used by the sight or hearing impaired, or in which the object itself is designed to be handled.

They are broadly recognised as having and transmitting the socio/political/emotional qualities I have ascribed to them. The horrors of Hendrix's version of 'Star Spangled Banner' are widely discussed (Whitely 2004, p. 21 - 26 outlines and discusses dicsussion on this.); a threnody is considered "a song of mourning, for the victims of violation" (Behnke 2002, p. 2) and Penderecki's is a cause of physiological responses (Vanderark and Ely 1993; Stephens, Israel C. Christie et al. 2010). These qualities are reflected in Goya's work, in which the "pitiful expression on the main figure's face, the blazing colour and dramatic lighting, the faceless impassive soldiers arrayed in a line against their victims, all contribute to making the painting a passionate protest against political tyranny it says, implicitly, that military occupations such as this one are evil, and their victims are martyrs." (Levinson 1995, p. 186) and Picasso's work has been described as   (insert references as footnotes here)

Transcending forms of artistic expression

There are many differences in the external, physical expression of different art objects. In Figure 2, below, four forms of art-object are shown, Sound, Image, Text and Movement, which are often considered as separate. This image indicates the position taken in this project, an intersection central to the making and experiencing of an artwork.

This intersection is simultaneously where differences are recognised and active, and where these differences meet and be transcended. This central position is the lens for this project and my practice.

Figure 2: Interaction between art forms.
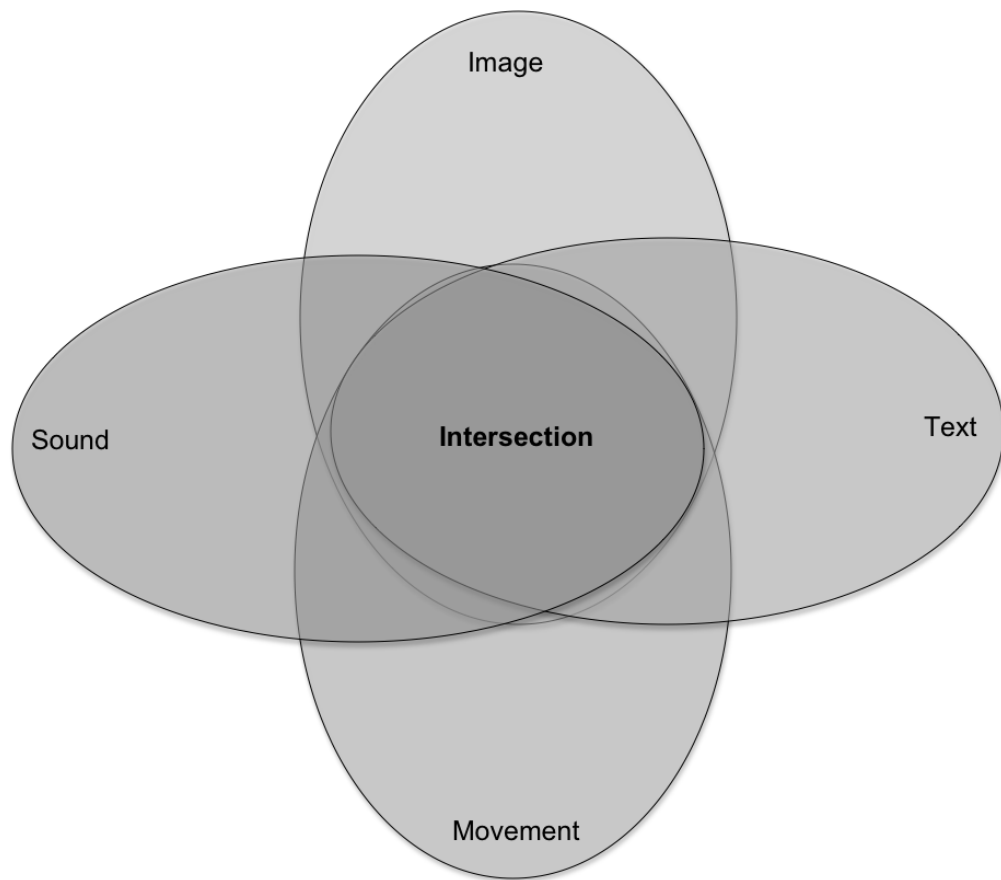
Propositions

This project is underpinned by a set of propositions that are personal, idiosyncratic, and intuitive:

1. That there is an inherent desire to make sense and reconcile phenomena in perceivers;
2. That all art is materialized and transmitted as a physical phenomena/object, the art-object;
3. That an art-object is usually first encountered as sonic and/or visual gestures (movement and physical art-objects such as dance or sculpture/installation are primarily perceived as visual and aural stimuli);
4. That the perception of an art-object is as vital to its existence as the act of making it;
5. That the art-object is a pointer to an experience residing exclusively within the perceiver, which is considered the artwork;
6. That the experience of an artwork is in constant mutation and flux;

7. That gestures coalescing within an art-object can be translated into data usable in digital technology;
8. That this data can be materialized in a variety of media;
9. That the perceiver's experience of the art-object is in fact the artwork.

These propositions form the basis of my art-making approach and process, relating to and affecting its fundamental nature. Each is a belief to be explored and interpreted through the development of this project and its outcomes.

These propositions inform the discussion in the chapters two, three, four and five, where each is considered further.

Outline

This document ranges through a number of paths to arrive at the three art-objects presented. Chapters Two, Three, Four and Five are outlined below, they indicate the web of intersecting ideas and approaches that have influenced the development of MOTION, SPEECH, and VISION in reference to the premises listed above.

Chapter 2: Conceptual frames, discusses the background ideas that I have brought to the project. In this chapter my considerations are personal and based on understanding that has developed over the development of my arts practice. I consider various theoretical frames to analyse my subjectivity and conceptual developments.

This chapter considers the desire to make sense (Proposition 1); the audio and visual nature and reception of that data (Propositions 2 and 3); the perception of the object/phenomena (Proposition4); and the role of the computer in the datafication and potential reinterpretation and reconstitution of that data (Propositions 7 and 8);

Chapter 3: Literature/Influences –Art-objects, discusses art-objects that have a profound effect on me each time I perceive them. These are from the sonic and visual arts, and have tangible media to which I may return to re-experience the art-object. The performing arts notably are absent from this list, as the experience of such works resides only in my current interpretation of what I remember of the performance, and this memory is influenced by far more than the object itself.

This and the following chapter consider the experience of an artwork, and how the object that generated that experience, no matter how constant or ephemeral, resides as the cause of the experience in the perceiver (Propositions 5 and 6). This consideration reflects the personal and autoethnographic position of both the creator and perceiver in the conversion of and art object into the experience of an artwork.

Chapter 4: Literature/Influences – Concepts follows; here I discuss the conceptual frames presented by François Lyotard's concept of the *differend*, Roman Jakobson's tripartite approach to communication, and John Cage's *Theater Piece No 1*, *4'33"* and *Radio Music* as they relate to the conceptual development of this project.

Chapter 5: Literature/Influences – Systems, is the final chapter considering the influences that have had impact. Here the concepts of Kansei, as an approach to the creation of objects, and notation as an approach to abstract representation of an object are exposed.

This chapter considers processes regarding the conversion of visual and sonic gestures into data, and the potential appropriation, re-contextualizing, and re-materialization of that data.

These chapters are not intended to be definitive or comprehensive considerations of the material discussed or a fulsome review of the vast literature relevant to this project. Their role is more to form a background of the ideas that have informed this project and my development as a practitioner over the course of this project.

Chapters six to nine discuss the development of the actual systems used, first in an overarching, general way, and then focusing more closely on each. Finally a conclusion discusses the relationship art-objects MOTION, SPEECH and VISION have to the conceptual frames, the integration of the two, and potential developments.

The artist and perceiver as autoethnograph and bricoleur

Here an art-object is understood as an autoethnographic expression of the artist, who brings the many contexts and paradigms that they hold to the creation of the object. The perceiver complements this, as their experience is an autoethnographic expression of themselves, as they also bring the many contexts and paradigms that they hold to the perception of the object and their resulting experience of it as an artwork . This causes constantly volatile and unpredictable results, which reflect, represent and celebrate the constant and idiosyncratic fluctuations of the various perceiving cultures and their inhabitants.

The Art-objects, Concepts and Systems discussed here are considered through an autoethnographic, emic, and etic prism. They are a personal expression of the artist through which he or she explores, researches, and understands the bricolage that makes up themselves and their work

Research Questions

The title 'Mapping gestures in the creation of intangible artworks' immediately poses four main questions. Here I ask and present possible responses to each, and explore those possible solutions in the development of the art-objects. These responses relate directly to the development of MOTION, SPEECH, and VISION.

What is a gesture?

As said above, a gesture requires or engenders a change of state. Examples of physical gestures include: causing fluctuations in electromagnetic waves (visual art), air molecules (sonic art), or the flexing and relaxing muscle groups (motion and spoken arts). Examples of mental gestures include: the transfer, synthesis and interpretation of ideas, and the internal and idiosyncratic development of an idea.[7] To reiterate the definition given under Operational Terms above, it is considered to be quintessentially a conscious or unconscious physical, sonic, visual or mental action that requires or engenders a change of state.

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[7] This may seem overly simplified but its purpose is to indicate the fundamental similarities of gestures.

How can gestures be mapped?

MOTION, SPEECH, and VISION approach physical gestures through two processes. They map motion, the act of speech, and the saccadic motion of the eye in order to produce the filters through which the physical action of their perceiver is represented in the audio-visual outcome. They also map mental gestures through the requirement that the perceiver adjust the outcome via an Interpretation interface. In doing so the perceiver applies their understanding and opinions to the art-object, as a direct contribution to the making of the artwork.

What is an artwork?

Here an artwork is considered to be a dynamic, intangible, ephemeral, internal experience created through the perception and subsequent interpreting of an art-object; it is the infection Tolstoy refers to, mutating according to the paradigms of its host. The art-objects described above, and later in this exegesis, are considered as systems that excite either the cochlea or retina and create an experience in their perceiver.

How can an intangible artwork be made?

That this experience is dynamic and mutating is vital to the ongoing value of any artwork. The vast majority of artworks, in the traditional meaning, have a material existence, such as the pages and typeface containing a script or musical score, the canvas and colours containing a painting, or the bodies expressing a choreographic work. Usually these objects have the quality of being repeatable, allowing them to be reviewed and considered in relation to remembered or recorded iterations.

An intangible artwork would not have this quality; it would exist only as a unique experience within its perceiver in the moment of perceiving. It could not be recorded, and any memory of it would be just that, having only the potential of repetition, without any possible guarantees.

The art-objects MOTION, SPEECH, and VISION attempt to fulfil these conditions through creating a situation in which the perceiver's interactions are represented exclusively and only in the moment of perception.

They require two physical objects in order to exist: the computer, which provides the environment in which the art-object exists; and the perceiver, who reifies the art-object.

This may imply that the software residing in the computer is the art-object[8]. However, it is no more the art-object than a paintbrush or piano are (these create the possibility of an art-object, but not the painting or music itself). Instead, MOTION, SPEECH and VISION form the content of the art-object through their interaction with the perceiver, and this event forms the intangible artwork experienced by the perceiver.

Figure 3 shows the continual, looping, flow between art-object and the perceiver's experience.

Figure 3: Flow of the systems in MOTION, SPEECH and VISION in creating an experience in the perceiver
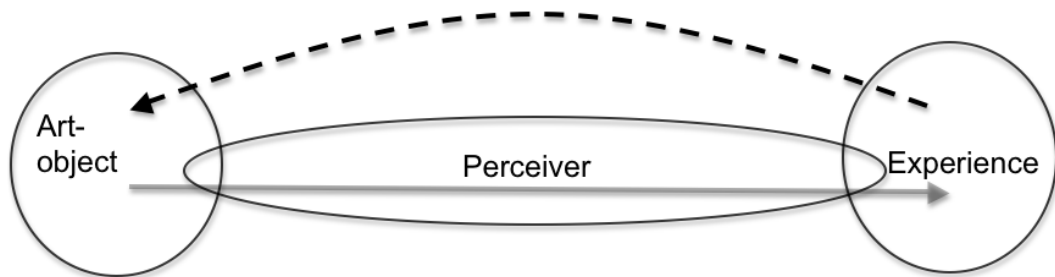
This flow is continual in the process of perceiving and interpreting MOTION, SPEECH and VISION. For this reason they are unique to each perceiver while in the immediate act of perceiving. They are never exactly the same. This makes MOTION, SPEECH, and VISION intangible. While there is an object to return to (just as a painting, or play may be returned to) the event caused by the object, and therefore the experience of it, cannot re-exist.

Anticipated Outcomes

The primary goal of this project is the creation of three art-objects that use the mapping of large to very small gestures to form the structure of intangible, ephemeral art-objects in the audio-visual domain.

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[8] This is discussed in Software art and conceptual art, on page 16, and an example of computer code as an object is given in Processing code for La Monte Young's *Composition 1960 #10*, on page 138; this print out of the code forms an empirical art-object.

These art-objects are intended to exist only in the moment of perception and to be unique to the specific perceiver, as they perceive them. It is also intended that the perceiver interpret the art-objects according to their own idiosyncrasies (within set parameters), therefore recreating the art-object anew each time they perceive it.

In developing this project I explore my approaches to the creation of art-objects in relation to the work of others, and through the development of MOTION, SPEECH, and VISION. The anticipated result will be a honing of my approach, to become more precise and clearly articulated, and which will reverberate through my art making long into the future (and consequently develop further).

Chapter 2: Conceptual frames, an overview

This chapter provides a broad overview of the wide and diverse range of conceptual frames that inform and influence my practice. These influences are constantly active in my art practice. At different times they have greater or lesser prominence and affect, and their effect is constantly mutating. Therefore drawing set relationships between these frames and the art-objects presented, MOTION, SPEECH, and VISION, is difficult, and doing so would confine their far-reaching and wide-ranging effect. Suffice to say that these frames provide a basis for my practice, and this shifting, undefined approach is essential to maintaining fluidity in my practice.

Computer as pivot

This is a transient age: information, and the cultures it creates, is concurrently swelling, shrinking, nascent and old; its influence is fluid and is continually being re-contextualized. Snippets of opinion are qualified into facts through complementary or supportive opinions; or scientific, intellectual, social, and aesthetic developments; or simply through repetition and the weight of numbers. These opinions/facts are equally susceptible to being questioned, refuted, or disproved through the same methods. This happens at a rate impossible to conceptualize in the recent past, or to keep abreast of other than with an extremely narrow focus.

A result of this transience is that art making has dramatically changed. A major contributor to this is the availability and use of computers and computer based technologies to a very large sector of the art making community, and the increased availability of information and data, its easy dissemination and retrieval, and the ever-expanding methods of data manipulation.

Now it is common to experience and exploit the resulting webs of changing information in which cultures are enmeshed with little critical or active awareness of them; and perhaps that unawareness is advantageous. We readily accept the perceived benefits that these developments bring, exploiting them in an immediate and accepting way, often without paying much active attention to the impact these systems are having on thinking, creating, culture and society.

These benefits include: the ability to rapidly and universally communicate ideas; to form broad or highly focused and specific personal relationships and collaborations without regard to location; to publish internationally at low cost; to model, explore and manipulate conceptual, mental, physiological, and physical properties and topologies simultaneously in extreme detail or breadth.

There is now the ability to readily form and reform relationships between objects and events at micro and macro levels. Relationships between these objects can be plastic, mutable and rapidly re-definable. This notion is fundamental to my project. Digital technology allows this by considering everything perceivable as quantifiable binary data, regardless of the subjective interpretations put on what is perceived. The atomizing of data, and the ability to sort, reframe and re-conceptualize it through digital systems is also fundamental to my project.

Developments in computer technology (MAX/MSP/JITTER (Zicarelli 2007), Pure Data/Gem (Pure Data 1996), Field (Downie, Eshkar et al. 2008), and Quartz Composer (Apple 2008), for example) have allowed for a much greater integration of sonic and visual elements, creating an environment in which they may be simultaneously composed at a core structural level, with the results of their creation being inherently linked.

Art (Everything) is Data

> When people talk, [their] voices shake the air; this makes your ear-drums move [exciting the cochlea]-- and then computers in your head convert those waves into constituents of words. These somehow then turn into strings of symbols representing words, so now there's somewhere in your head that "represents" a sentence. What happens next?

> When light excites your retinas, this causes events in your brain that correspond to texture, edges, Colour patches, and the like. Then these, in turn, are somehow fused to "represent" a shape or outline of a thing. What happens then? (Minsky 1982, ARE HUMANS SELF-AWARE setion, para. 3)

To answer Minsky's questions: when we perceive changes in electromagnetic waves (what we see) and air pressure (what we hear), we translate and interpret those events within the contexts and paradigms we hold.[9;] We do this in order to assimilate and use that input; this is how we perceive most events, including art-objects: in a way that we can create a relationship between the art-object and ourselves.

For example: we often interpret organized changes in air pressure as sonic art (music fits this category), and then apply references that we hold, and our consequent responses to those references, in order to apply meaning to that shaking air. We equally interpret the organization of electromagnetic waves (what we see) as viewable art, and similarly apply meaning[10].

Considering these fluctuations of light and air as data removes these limitations, creating an impartial equity of meaning, and meaninglessness, between all events; allowing any event to be reconsidered and reinterpreted through any of the processes that manipulate data. Therefore the meanings and interpretations traditionally applied to any art-object so that it becomes 'manageable' can be disregarded when interpreting, or reinterpreting, the work.

Audiovisual and multimedia

These terms usually refer to art-objects that simultaneously present sound and vision, usually through screens and speakers. When making such works the two elements may be created separately and then joined for presentation[11].

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[9] The fact that we, as individuals, will try to accommodate events within our held paradigms demonstrates that we value those paradigms enough not to disregard them in the case of unexpected events.

[10] Sonic art includes art such as music, drama and film, in which a heard element is fundamental and essential. Viewable art refers to art that has an equally fundamental and essential visual element, such as sculpture, dance or drama. There are many perturbations of air molecules that are not heard as music, just as there are many movements of electromagnetic radiation that are not seen.

[11] The performance arts often use this approach, and in the best examples there is a seamless integration of the two elements, such as that aspired to in Wagner's *Gesamkunstwerk*. Often perceivers synthesize this integration while in the act of perceiving the art-object; the collaborations of Cage, Rauschenberg and Cunningham are an example of audio and visual elements being concurrently presented with the explanation that perceivers synthesise these elements.

Cochleo-retinal [12] is a term that may subvert the traditions applied to the creation and perception of *audiovisual* or *multimedia* art. It implies a process designed not to link the sonic and visual domains, but to form and inhabit another domain, in which the cochlea and retinal senses are considered as one, both in creation and perception. Unfortunately it is clumsy, and the hyphenated *audio-visual* is a better term to denote art-objects designed to address the cochlea and retina in their creation and reception.

Software art and conceptual art

MOTION, SPEECH and VISION may be seen as fitting within 'software art' and 'conceptual art', and some underlying concepts of this project fit those paradigms. However, they are distinct from 'software art' or 'conceptual art', and they do not intend developing or commenting on those paradigms. That said, it is useful to briefly discuss 'software art' and 'conceptual art', to clarify that distinction.

Conceptual art

Conceptual art "is intended to convey an idea or a concept to the perceiver, rejecting the creation or appreciation of a traditional art object … as a precious commodity. [Conceptual Art is] dependent upon the text (or discourse) surrounding it" (Delahunt 2010, para. 1). Taking this definition to its logical conclusion, a conceptual artwork would not create an event or object outside of the concept itself, thus obviating the materialization of the concept. It could be "an attempt to produce aesthetic sensations without the intervening 'object'"(Shanken 1998, quoting Jack Burnham, p. 2).

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[12] In his book <u>In the Blink of an Ear: toward a non-cochlear sonic art</u>, Seth Kim-Cohen considers sound art from a non-cochlear perspective, just as Duchamp considered visual art from a non-retinal perspective. In using these terms, both Duchamp and Kim-Cohen gave primacy to these receptive organs, highlighting that sound and visual art both provide physical phenomena that generate chemical, mechanical and electronic reactions prior to any mental response.

An example is "formalisms like twelve-tone music, [where] the structure or concept of those artworks is … aesthetically more interesting than the product of their physical execution" (Cramer and Gabriel 2001, para. 10)[13]. However there must be some method of externalizing the artist's concept in order that it 'infect' others with the aesthetic sensations. This is often done using words, physically executing the concept through a textual art-object. LaMonte Young's *Composition 1960 #10*, (Young 2010, WORKS section) and General Idea's "THE GARB AGE COLLECTION---Green Plastic Disposables" (1969, p. 109) are examples of this.

Some examples of contextualizing an object by giving it a title that forms a dialogue/dialectic between the image and its perceiver (and consequently the artist), are "Erased de Kooning Drawing" by Robert Rauschenberg (1953) and Damien Hirst's "The Physical Impossibility of Death in the Mind of Someone Living" (1992). Placing the written word in the art-object, such as Sol LeWitt's "Plan for Wall Drawing" (1969), and choice of location, such as Duchamp's "Fountain" (1917) are other examples using text in Conceptual Art[14].

When discussing Conceptual and Performance Art, Frazer Ward (1997, p. 36) argued that

> Conceptual Art might be considered as work that emphasized the underlying conditions of aesthetic experience: Language was seen as foremost among these conditions. Material form and sensory perception were made secondary to analyses of their discursive and institutional frames.

Ward quotes Anne Marsh's definition of Performance Art:

> The main difference between performance art and other modes of visual art practice, such as painting, photography, and sculpture, is that it is a temporal event or action. (Ward 1997, p. 40)

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[13] Of course there are a number of very aesthetically pleasing 'twelve-tone' compositions, and Cramer and Gabriel's opinion is not fully shared.

[14] Defining 'Conceptual Art' is extremely problematic and it seems most definitions are idiosyncratic. The art-objects listed here may or may not fit the classification for reasons ranging from date (some may think that *Fountain* was at the vanguard, others that *Erased de Kooning Drawing* is when Conceptual Art came in to existence), or that the art-objects themselves are not considered by the reader as fitting. Suffice to consider the conversation between Seth Seigelaub, who said "The label conceptual art is simplistic and misleading" and Michel Claura, (1999, p. 286 – 290) who followed with "one is never short of definitions that are as distorted as they are appealing."

However this temporality is subverted by the existence of an object such as a script or other form of instructions, like that used in Vito Acconci's *Step Piece*,

> An eighteen-inch stool is set up in my apartment and used as a step. Each morning, during the designated months, I step up and down the stool at the rate of thirty steps a minute; each morning, the activity lasts as long as I can perform it without stopping.... Announcements are sent to the public, who can see the activity performed, in my apartment, any time during the performance-month. (Ward 1997, p. 37)

It is possible to see that this description could be considered a script similar to Samuel Beckett's *Quad* (1984, p. 291) and *Act Without Words II* (p. 49).

Software art

Software created under the banner 'software art' creates a possibility of an artistic event. Often it is a tool with which others can make art-objects, as shown by the diverse comments from academics, curators, software artists/creators and commentators below.

> [Software art is not the code, it is] the systems, not their outputs or residues, [that] are the core of the work. [And that these] systems can also be described in other forms, either "natural" or other languages. (Whitelaw 2005, p. 2)
>
> The code is a set of rules or parameters. These rules become the art. They are the essence of the experience and aesthetic direction. (Sacks 2005, para. 2)
>
> [It] includes any form of programming activity involved with creating artistic systems that generate works of art and/or are works of art themselves. It focuses on the aesthetic aspect of software creation and is often seen as personal expression of the programmer. (Magnusson 2002, p. 6)
>
> [The] software artist marks his/her mark on the world by writing the original code. This act of code writing itself is very important, regardless of what this code actually does at the end. (Manovich 2005, p. 6)

While Manovich (2002) saw that software art became a new media in about 2000, he acknowledges that work in the area of computer generated art has a longer history. Computational art-making systems have existed since at least the tenth century, when Guido of Arezzo developed a system that used the phonemic structure of a text as an aid in composing plainsong (Rowe 1993, p. 32-36). Other examples include the systems relating to perspective developed in representative art from the Middle Ages to the Renaissance.[15]

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[15] Manovich does not refer to these areas of non-computer based conceptual processes in the discussions listed.

Now the use of systems continues with computer-based assistance: software such as Kurzweil's text generation program Cybernetic Poet (2000), Cohen's painting program AARON (2001), and Cope's (1987; 1992; 1999; 2003) and Dannenberg's (Dannenberg, Desain et al. 1992; Dannenberg 1993; Dannenberg 2002; Dannenberg 2003; Dannenberg, Bernstein et al. 2003; Dannenberg 2005) music making systems are examples, as is Lauzzana and Pocock-Williams (1988) positing of rule systems for analysing visual arts[16]. These are a very few of the instances of computer created, or aided, art making systems, and this is a constantly developing and expanding area.

Software Art has a clear relationship to Conceptual Art. This tack is followed by Florian Cramer (Cramer and Gabriel 2001; 2002; 2003), considering La Monte Young's *Composition 1960 #10* [17], saying

> [it] could serve as a paradigm for Henry Flynt's 1961 definition of Concept Art as "art of which the material is `concepts,' as the material of … music is sound.''... In analogy, we would like to define software art as art of which the material is software. (Cramer and Gabriel 2001, para. 10)

Cramer continues,

> [software] art in particular differs from software-based art … in that it exposes its instructions and codedness. Since formal instructions are a subset of conceptual notations, software art is, formally, a subset of conceptual art. (Cramer 2002 Concept Art and Software Art section, para. 2)

Software/conceptual art and this project

Articulation of the idea behind the art-object and the assumption that an audience will both appreciate the idea as the art-object, and assume that that is the best reification of the artist's intention, is simultaneously problematic and simple. It forms a vortex of the art-object, its perceiver, its intentions and interpretations, its maker, and its context.

---

[16] These activities dating back over twenty years may seem ancient by current standards. However, most of the root paradigms and approaches remain relevant.

[17] The score for this composition is "Draw a straight line and follow it".

To put Goya, Penderecki, Picasso and Hendrix's intentions into words could reduce the effectiveness of their visual and sonic statements, just as to express the intentions of Eugene Gomringer's poem *silencio* in non-visual media (see Figure 13, on page 68), and Joseph Kosuth's *Definition (Thing)* (1968) in any other medium than he has chosen, would reduce their effectiveness.

Both Acconci's and Young's work are listed at http://instructionset.org/, a site where computer programmers are offered instruction sets to fulfil using any programming method that they choose, which may then place both of those art-objects in the genre of 'software art'[18], particularly after the code is run and the art-object made.

A play script structures the playwright's intentions for interpretation in performance. However, while scripts are completely verbal, providing a set of instructions that form a pointer to a performance, they are rarely considered as either 'software' or 'conceptual' art.

In MOTION, SPEECH and VISION, the structures are the mapped gestures articulated through those systems, and the material is the perceiver and his or her interpretation of the art-object, thus "fusing both observer and observed, "inside" and "outside"", referring again to Burnham, in Shanken (1998, p. 3).

MOTION, SPEECH and VISION's systems have two functions; mapping the three physical gestures onto the creation of three art-objects, and representing the perceiver's interpretation of the art-objects while perceiving them.

The gestures mapped range from the physical movement of the perceiver captured while viewing the object, through the smaller motion of the mouth as represented by the phoneme string of a poem, to a simulation of the saccadic action of the eye when focussing. The perceiver has no control over this section of the art-object.

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[18] An example of Processing code written to fulfil the instructions of Young's composition is given in Chapter 2 Appendix, page 161

And, while perceiving the outcome of these processes, the perceiver is required to interpret what they are perceiving via the Interpretation interface. This is where the perceiver exercises control over the art-object, affecting it to fit their paradigms.

Figure 4: Integrating the acts of perceiving and interpreting to experience the art-object as the artwork

PERCEIVER
ACTIONS

Act of
observing
MOTION,
SPEECH
and VISION

EXPERIENCING THE ART-
OBJECTS AS ARTWORKS

Act of
interpreting
MOTION,
SPEECH
and VISION
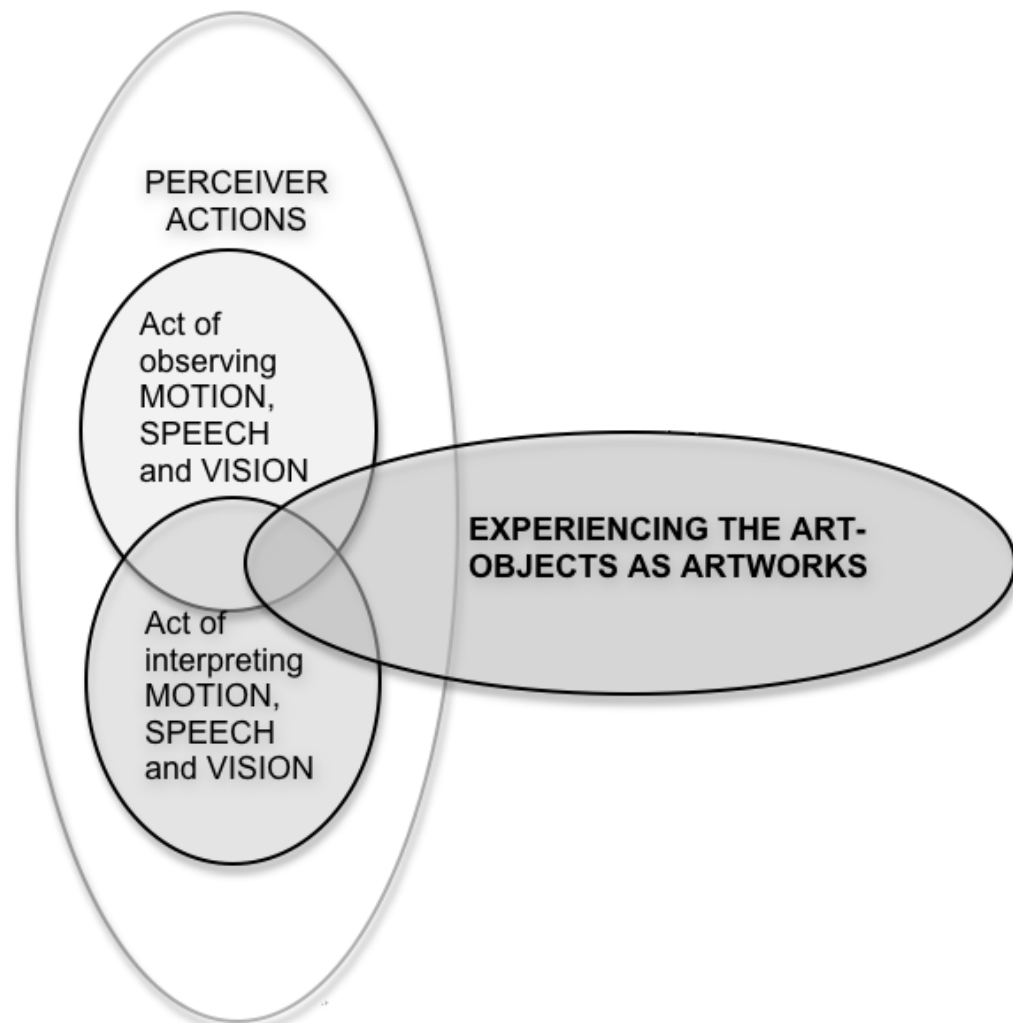
This capacity to influence the art-object according to the ephemeral paradigms through which any art-object is perceived is the process through which these art-objects are made intangible. The systems that facilitate this are discussed in Chapters 6, 7, 8 and 9.

Making sense of non-sense

Integrating immediate perceptions and interpretations by relating them to remembered events is a way to understand current events; and through creating these relationships new understandings are formed.

This process of understanding is often seen as being intuitive; and this is often not easily traceable or describable for the perceiver. Piet Mondrian (in Harrison and Wood, 2003) describes the process of understanding 'abstract' or non-denotative art, saying

> Art makes us realize that there are fixed laws which govern and point to the use of constructive elements of the composition and of the inherent relationships between them, [these are] subsidiary laws to the fundamental law of equivalence which creates dynamic equilibrium and reveals the true content of reality. …
>
> [Art shows] that in the course of progress, intuition becomes more and more conscious and instinct more and more purified. Art and life illuminate each other more and more, they reveal more and more their laws according to which real and living balance is created. …
>
> Intuition enlightens and so links with pure thought [, becoming] an intelligence which is simply not the brain, which does not calculate, but which feels and thinks. (p, 360).

When Mondrian wrote this in 1937 he saw a maturing form of intelligence. He also sees a '*fundamental law of equivalence'*, which reflects '*the true content of reality*'. It is the understanding of this equivalence that causes the drawing together of actions, objects and representations in order to make sense.

Structure creates (a sense of) meaning

If a specific and known structure is used in a communication there is an assumption that the elements using it will make sense. An example is

> Noam Chomsky's classic example in *Syntactic Structures* of a sentence that makes no sense but is still grammatical. It reads "Colourless green ideas sleep furiously."
>
> If you take "green" to mean unripe or … unthought out, ideas can be Colourless in the sense of bland, simplistic, or dull, as well as green; …, if you take "sleep" as implying dreaming … you can sleep furiously. (States 2011, p. 108)

Here States demonstrates how considering the words of the sentence as metaphors allows the reader to apply their own meaning to the text.

Other examples of the potency of an accepted structure creating a sense of meaning in a perceiver is seen in the work of Andrew Bulhak's 'Postmodern Essay Generator' (1996) and Alan Sokal's hoax (both discussed further in Chapter 2 Appendix, on page 163), and the Ern Malley poetry hoax of the 1940's (McHale 1999).

Meaning creates (a sense of) order

The logo FCUK (© French Connection) is a converse example to those of Bulhak and Sokal, where each element of a particular word is present but the syntax is unexpected. Here we may assume a more expected ordering of the letters, in much the same way that it is difficult to notice typographical spelling errors, particularly in our own writing. There is now an understanding that if a word's letters are displaced, the reader may ascribe the intended meaning to the jumble of letters (Rayner, Sarah J. White et al. 2006; Acha and Perea 2008). Lewis Carroll's Jabberwocky is an example of nonsense words that follow the English language letter order (discussed further in Chapter 2 Appendix, on page 164).

In sound

Words are organized sound, just as music is organized sound. The difference is that words have very well codified meanings within specific cultures and locations, whereas the codifications of sounds in music are more ineffable, but often as easily understood. Codifications of similar sounds can change depending on the culture and location in which the musical expression is being made. An example of this is differences between the chromatic and heptatonic scales of European and Indian origin and the resulting structural differences in the music and what it communicates (discussed further in Chapter 2 Appendix, page 165).

In vision

Processes for organising images are as prevalent as those for organising sound, and often-similar terms and codifications to music are used. This is seen in the work of authors such as Kandinsky (1977; 1979), Mondrian (2003), Gombrich (1977), Kress and Van Leeuwen (2006) Lauzzana and Pocock-Williams (1988), and Jensen's (2002) work on mathematical structures in art.

Audiences try to make sense of images that they see in terms that they can relate to; and this is often done by finding or synthesising anchors through which to develop a relationship to, and understanding of, the image.

These anchors may be within the work, such as an image that replicates an object (a nude or a still life for example), or it may be a title to the work, or a conceptual/philosophical discussion, a rendition of natural or mathematical phenomena, or an object so abstract that, like music, it cannot be considered in any terms other than itself[19].

Perception and interpretation

Here, the perception of an art-object is considered as the reception of the sensory, empirical, events created by the art-object; it is a neurophysiological process.

Perception has increasingly internalized definitions ranging from the external, unmitigated and unmediated excitation of the senses; through having an awareness and regard of this excitation; the interpreting and understanding of it; to having an understanding based on intuition that is not necessarily based on sensory excitation. While our perception may intuitively give access to reality it is also prone to illusion. This gives rise to a problem:

> "the problem of perception", … created by the phenomena of perceptual illusion and hallucination: if these kinds of error are possible, how can perception be what it intuitively seems to be, a direct and immediate access to reality? (Crane 2008, para. 1)

Art making is the making of illusion and allusion, it does not intend to offer "a direct and immediate access to reality"; instead it offers a commentary on that.

This problem is considered by C.S. Peirce (1931, 1.335 Cross Reference), saying

> Some writers insist that all experience consists in sense-perception; and I think it is probably true that every element of experience is in the first instance applied to an external object. A man who gets up out of the wrong side of the bed, for example, attributes wrongness to almost every object he perceives. That is the way in which he experiences his bad temper. It cannot, however, be said that he **perceives** the perversity which he wrongly attributes to outward objects.

Arthur Koestler (1975, p. 77-83) sums up this process of perception, and the filters applied to it:

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[19] A more detailed discussion is in Abstract art and meaning, on page 194.

> man has an irrepressible tendency to read meaning into the buzzing confusion of sights and sounds impinging on his senses; and where no agreed meaning can be found, he will provide it out of his own imagination. ... The sensorium extracts meaning from the chaotic environment as the digestive system extracts energy from food. (p. 83)

This tendency is facilitated by "filters or scanners [whose] function is to analyse, decode, classify and abstract the information … until the chaotic multitude of sensations … is transformed into meaningful messages" (Koestler 1975, p. 77), and these interpretive filters operate at a deeply accepted and unconscious level. Koestler gives the example of the 'size constancy phenomenon': we understand that distant objects are actually not smaller than identical nearer objects, even though the image of the closer object, is larger than the image of the far one.

These filters offer not only practical interpretations but also connect to make external ideas manageable to the perceiver. Interpretation is the process of making external input manageable for the perceiver.

In Against Interpretation Susan Sontag (1966) indicated the lengths that perceivers will go to, to interpret the "chaotic environment" of ideas within idiosyncratic paradigms. She discusses Elia Kazan's filmic interpretation of *A Streetcar Named Desire*, saying

> in the notes that Elia Kazan published on his production of A Streetcar Named Desire, it becomes clear that, in order to direct the play, Kazan had to discover that Stanley Kowalski represented the sensual and vengeful barbarism that was engulfing our culture, while Blanche Du Bois was Western civilization, poetry, delicate apparel, dim lighting, refined feelings and all, though a little the worse for wear to be sure. Tennessee Williams' forceful psychological melodrama now became intelligible: it was about something, about the decline of Western civilization. Apparently, were it to go on being a play about a handsome brute named Stanley Kowalski and a faded mangy belle named Blanche Du Bois, it would not be manageable. (Sontag 1966, section 5, para. 4)

within the limits of Kazan's ability to interpret/reinterpret, and therefore apply meanings useful to him. To this end Kazan mediated Williams' play within his paradigms and goals in making his art-object.

Often there are mechanical requirements for mediated interpretations, such as those required when interpreting languages of different structures[20]. However, in more complex situations, a merging between the paradigms of the receiving language and the idiosyncrasies of the interpreter may become more apparent in the transference of the content being interpreted, which is what Kazan did.

Interpretation as a process of appropriation

The interpretations of any event are as diverse as the number of interpretations being made, and they are usually idiosyncratic to the immediate needs of the interpreter.

Michelangelo's image of the Creation of Adam, from the Sistine Chapel, is a work that has been understood in many ways. The hands of God and Adam, for example, may be interpreted as conveying senses of passivity and action, one being limp and the other active and directed; or of a desire by one to contact the other; or of indicating the longing created by separation.

The container surrounding God and the Host is interpreted as representing the brain stem (Strauss and Marzo-Ortega 2002) and the uterus (Tranquilli, Luccarini et al. 2007), and the angel in the crook of God's arm has been considered from an intensely feminist position[21].

These interpretations of the relationships between God and Adam, and Stanley and Blanche are examples of the perceiver interpreting the same object in order to represent their unique and individual perspectives and goals.

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[20] For example, classical Arabic sentence is structured Verb, Subject, Object, as in "Sat the cat on the mat". An English interpreter would restructure the sentence to Subject, Verb, Object, *"The cat sat on the mat",* making changes required by the paradigms of the receiving language.

[21] A more detailed discussion of theses and other interpretations, including images, page 184.

Categories of art practices

Practice categories

MOTION, SPEECH, and VISION may fit the categories: 'electronic art', 'computer art', 'interactive art', 'video art', 'sound art' and/or 'conceptual art', as they use aspects of each. These labels often signify the tools, method, or media the artist uses, but rarely indicate the impulse expressed in the artwork, or the mental experience communicated to the perceiver. Labels may be useful, but they can confine the experience of an artwork, as they often imply exclusivity.[22]

An example of the problem this categorising may cause for the artist is seen in computer artist Manfred Mohr wanting his work not connected with the computer, as he felt the label predisposed how people considered work (Paul Brown, in Lambert 2003). Lambert goes on to ask if it is appropriate for 'computer art' to be considered and assessed through the same paradigms as photography, sculpture and animation.

MOTION, SPEECH, and VISION use electronics, computers, and the perceiver's interactions to create immediate visual and sonic outcomes unique to the perceiver. They also require the perceiver to experience the work conceptually, engaging with the process of creating the visual and sonic outcome and their immediate interpretation of it.

The purpose of these art-objects is to create a process in which the artwork is an expression of the perceiver's interaction with the art-object. While they exist as software within a computer, they exist as artworks only through the interaction of the perceiver. This interaction creates the video and sound output, and the experience of the work then resides conceptually in the perceiver.

---

[22] Labels ascribed to artists also prescribe the way in which their work is considered. For example, the experience of Britney Spears music may be filtered by an opinion of her publicized actions. The same may be said for the artwork of Yoko Ono, John Cage, or Bertolt Brecht, whose perceived personas and writings about them, form filters though which their art is considered, and this may have a positive or negative effect. In extreme cases the artworks become incidental to the artist or to the opinion of the artist as a person.

Theoretical categories

MOTION, SPEECH and VISION also fit Charles Baudelaire's meaning for modernity, through being "the ephemeral, the fugitive, the contingent, the half whose other half is the eternal and the immutable [and providing a] transitory, fugitive element, whose metamorphoses are so rapid." (Baudelaire 1964, trans. Jonathan Mayne, p. 13) .

Thus the artworks resulting from MOTION, SPEECH and VISION are ephemeral, they cannot be captured, and are eternally contingent on the perceiver to provide the complement that transforms them into artworks (Baudelaire 1964).

They also address Lyotard's "incredulity toward metanarratives" (1984, p. xxiv). While not addressing the grander narratives of political and social interaction such as capitalism, feminism, art, and religion, MOTION, SPEECH and VISION address some narratives that exist within the arts:

- the role of the author as creative agent/communicator, and the perceiver as passive receptor/communicatee, in which there is "the belief that art is in its essence the expression of an individuality of genius assisted by an elite craftsmanship" (Lyotard 1984, p. 74);
- the artwork as having a constant materiality (the art-object), which can be returned to and re-viewed and that exists extra to its perception;
- the art-object contains the experience of an artwork.

These metanarratives are well entrenched in the art-world, having much evidence to support them, such as: galleries filled with unseen art objects, scripts and scores signifying repeatable and analysable performances, and authors considered to have an individual genius that is expressed through an elite craftsmanship.

The cochlear/retinal excitation caused by MOTION, SPEECH and VISION are interpreted and adjusted by the perceiver, creating their own personal artwork while interacting with the object, and which exists only within them. They are

> not in principle governed by preestablished rules … and cannot be judged according to predetermined judgement, by applying familiar categories to [it]. Those rules or categories are what the work of art itself is looking for. The artist [is] working without rules in order to formulate the rules of what *will have been done* (Lyotard 1984, p. 81)

MOTION, SPEECH and VISION require the perceiver to find, formulate and apply the narratives and categories through which to transform the cochlear/retinal excitation into their own artwork.

Frames for developing MOTION, SPEECH and VISION

When developing these art-objects it became apparent that the typical delineations between art forms, such as painting, film, music, sculpture, theatre, and dance, and their subsets did not apply to my aesthetic goals. Nor was it appropriate to develop them with a focus on the practice and theoretical categories considered in the previous section.

Such categories are expanded and transgressed at will by the creative art maker, but often they form borders and create a sense of separation and difference. To facilitate a more open set of definitions through which to view art-objects I theorised the categories *mutable*, *immutable*, *temporal* and *static*. To define these terms here:

In *Mutable* arts the maker or performer creates, re-creates, or interprets the art-object, usually *in situ* and through immediate performance and/or interaction; examples include the text of a play or a musical score;

In *Immutable* arts the perceiver alters the work, usually through their interpretation or through manipulating the presentation medium: examples include a book, a musical recording, a painting, or a film;

Temporal arts require an author/presenter defined time period in order to be expressed. Here the presenter prescribes the perceiver's trajectory through the work, which is mostly performance or documentation based, for example music, film, or a book;

Static arts are often gallery based, can be immediately and entirely perceived by the perceiver at their own leisure. Here the perceiver maps their trajectory through the work; examples of this category include painting, and sculpture.

Viewing art making and perception through these frames removes the borders discussed earlier.

Clearly there are points of convergence between these categories. For example, *Mutable* and *Temporal* arts such as (live) drama, dance and music, could be seen as inhabiting the same frame, as "one cannot step twice into the same show" (Wolska 2005, p. 84). Also, *Immutable* and *Temporal* arts such as film, text and recorded music, in which the perceiver can step into the same work as many times as they wish, fit similar conceptual frames.

Concluding comments

The variety of conceptual frames introduced here is very broad, indicating the breadth of influences that mutate and combine in my practice. The three main areas considered are: the capacities of computer-based systems, the conceptual frames inherent in those capacities, processes of perception and interpretation, and ways of considering arts practices.

The interpretation and position taken on each of these frames is idiosyncratic and very personal. In fact, I am very hesitant to subscribe to any of these frames as singular ways to consider my practice or its focus. This does not reduce the impact that they have in the creation of my works, and the interaction of these frames is fundamental in the ongoing development of my practice and its processes.

Computer-based technologies are clearly fundamental to my practice, particularly as they allow a transparent integration of physical and mental gestures and concepts. These technologies also allow the expression of this integration.

When perceiving any event humans usually desire to interpret and reconcile those events within a known set of paradigms, and this is so when perceiving any art-object.

When interpreting an art-object the perceiver does so within their paradigms. This can lead to an interpretation that is not intended by the objects maker; the perceiver/interpreter may fully adjust the artwork residing within the art-object to fit the needs of those paradigms.

The perceiver may have a need to interpret the art-object within a broadly held set of terms and categories, and the practical or theoretical paradigms that they contain. In doing so the perceiver may modify their conception of the art-object to fit those terms and categories, and thereby modify the artwork and their experience of it.

In 1979 art critic Clement Greenberg made a comment that can be extrapolated to fit any categorisation of arts practice, saying it is "in the area of painting and sculpture that I've mostly heard and seen postmodern used -- but only by critics and journalists, not by artists themselves" (1979, para. 2)

While making a work, any attempt to understand it from a theoretical position may hamper its creation, causing the maker to second-guess interpretations of the work prior to its existence. This is not to say that the theories of, for example, modernism or post-modernism, and their antecedents, do not influence an artist while making a work. They are simply interpretations and labels of existent works that form a part of the web from which new works are built.

Often these labels are used to fit an art-object within an exclusive context, making it explainable and assessable against other objects considered in the same category.

Le Corbusier (2008, p. 151) conceptualised the house as a machine for living in conceptualizing it as a system for a purpose. This metaphor may be applied to art objects, whereby they are machines for transmission.

MOTION, SPEECH and VISION are machines for transmission, it is when the transmission is actively perceived and interpreted that they become artworks living within their perceiver.

Chapter 3: Literature/Influences – Art-objects

This chapter discusses some art-objects that have value to me as an artist through an idiosyncratic lens[23]. The five artists listed below represent a sample of those that have a profound influence on my practice, and many worthy influences are omitted.

While there may not be immediately obvious links between the work of these artists and MOTION, SPEECH and VISION, their influence has inspired my practice, and this is an attempt to explore and understand that influence. After discussing each of the works, I will discuss their collective influence on my practice in *Concluding Comments*, at the end of this chapter.

Zero Radius: Ryoji Ikeda

Ryoji Ikeda is a computer music and installation artist who collaborates in the performing arts group Dumb Type . His work uses ultrasonics to explore sensory aspects of sound. (Polecat 2005).

Ikeda uses loops of varying lengths, causing a sense of temporal elasticity, and his attention to the perception of sound and psychoacoustic phenomena add to this experience. He describes his work as having

> a particular sonority whose quality is determined by one's listening point in relation to the loudspeakers. Furthermore, the listener can experience a particular difference between speaker playback and headphone listening. The sound signals can be thought of in the same way as spotlights" (Stankievech 2007, p. 57).

Ikeda's use of very high frequencies develops a sense of the physical/sensorial space, combining temporal, location and frequency architectures to create a sense that each listening is new, and unique to each audience member, causing a sensation rather than an experience of a heard sound.

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[23] Chapter 3 Appendix, on page 185 has more detailed discussions which amplify my considerations of each of these art-objects.

Zero Radius (Ikeda 1998), composed for the performance *OR*[24], was the first of Ikeda's works I heard. It has the capacity to create a sense of great, but static, energy in me. It creates and reconciles opposing senses of stillness and activity, and this reconciliation of opposing forces is a focus of my work.

This is derived from the use of known sounds and structures. Ikeda uses familiar electronic sounds: medical equipment, the sonar ping of a submarine, ventilators, white noise, and so on. These sounds have resonances of a conditioned and controlled environment, representing the alienation and submission to technology often experienced in hospital situations. He covertly creates a sense of motion and predictability, two requirements of typical Western music, through the relentless repetition of the rhythms, and this reinforces the sense of oppressive stillness and powerlessness that enhances that experience.

Fragmente – Stille, An Diotima, Luigi Nono

Luigi Nono is one of the most influential and powerful composers of the twentieth century, and *Fragmente – Stille, An Diotima* (1986), performed by the LaSalle Quartet, has an extraordinary, ineffable, effect on me in every listening. Michael Gorodecki (1992, p. 14) describes it well, saying

> In Fragmente - Stille, An Diotima, … Nono reached … the realization of musical and philosophical preoccupations that were in embryo six years earlier. The pause, in which sound or silence could be listened into anew, uncertainly, sometimes painfully, was an essential constituent of Nono's sound vision. … Everything is incomplete. But this is part of Nono's aesthetic and philosophy; and the fundamental quality of fragility is reflected in the elusive poetic quotations from Hölderlin sprinkled across the score for players to intone silently to them-selves. The most frequent phrase, 'Aber das weiss es nicht' (but that it doesn't know), might be considered a motto. … At its root is an attitude filled with uncertainty, but also a boundless quest in the search for the unknown; musically-speaking a faith and openness to all the possible discoveries of listening and imagination made along the path.

It is made up of many fragments, which sometimes elide, and sometimes remain discrete. The experience of listening to it is of constant surprise; delicate gestures seep out and gently fade, and strident, demanding gestures leap forward and just as rapidly recede.

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[24] *OR* is a performance/concert/installation work created in response to the illness and subsequent death of the group's artistic director and performer Teiji Furuhashi in October 1995.

The Deutsche Gramophon recording I listen to has two translations of the title: in English; "*Fragments: Stillness For Diotima*" and in French; "*Fragments: Silence, A Diotima*". The two translations for *Stille* reflect two viable understandings of the piece, as it uses silence as potently as it uses sound; and, along with the constant sense of expectation and imminence, create a strong sense of stillness in the listener. The two terms, 'Stillness' and 'Silence', while coming from two distinct languages, are both common English words, each of similar metaphoric capacity[25].

Fragmente … is designed to be both heard and not heard, to attract a way of listening that subverts the usual ways of listening, and requires of the listener an unusual introspection, one that does not require or provide, questions or answers. Ikeda's work is obvious, in that we see and hear what he unequivocally wants us to see and hear, and Nono's is opaque, in that it sits in the limina of musical expression and apprehension. There persists a similarity in that they both represent what may be typically ineffable.

Chapter 3 Appendix, contains a more detailed discussion of the piece on page 188.

True Blondes

I first saw Yuskavage's work when a friend suggested that we visit a gallery[26] where her friend worked. The exhibition was to open in a few days and some paintings were hung while others were resting on the walls. Perhaps the informality of my first viewing of Yuskavage's works, and the somewhat voyeuristic sense that I should not be there, heightened the experience of the paintings. While the objects are distinctly different, my experience was similar to first seeing Jackson Pollock's *Blue Poles*; I was 'stopped' and unable to experience the works through my usual paradigms and filters.

I agree with Deborah Solomon's (2000, para. 6) comment that

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[25] To say 'Be still" implies being silent as well, and to say 'Be silent' implies being still.

[26] Marianne Boesky Gallery

> When you look at a Yuskavage painting, you aren't sure if you're supposed to feel titillated or offended, or if the proper response is to rush to your desk and write an essay on the eroticizing tendencies of "the male gaze."

The paintings stunned me. I was completely unsure of how to react: there was a gentle familiarity battling an erotic response. I was reminded of a print of a wan and tearful young woman in a tatty, broken frame that I had seen in a shed as a child. I was also charmed and absorbed by the human, un–touched-up beauty of the women portrayed, and simultaneously alienated by their misshapenness.

Yuskavage created an erotic attraction and erotic repulsion simultaneously. I felt compelled to see the images as erotic and the women as highly stylized objects because that is how they were presented and it is how I have been acculturated to see them; yet I could feel nothing but empathy for them too.

The responses Yuskavage created in me took me from the paintings themselves. I became unable to view them as works of art, and instead they became triggers for confusion. I was unable to objectify the women in the images, yet that objectification could quite clearly have been a possible reason for creating the images, if made by lesser hands.

Trying to interpret and reconcile these experiences took my attention as much as, and then more than, the works themselves. I felt myself bouncing between the positions of enjoying the paintings and the resonances they elicited and the equally strong desire to decode and reconcile my reactions with my understanding of myself.

Yuskavage's process is discussed in Chapter 3 Appendix, page 198, and two images from the exhibition I am referring to are included.

A Box of Smile

Yoko Ono's work *A Box of Smile* is an example of the audience creating the work; it does not exist until it is viewed, it is possibly one of the most transparently interactive works created. The version of it I saw was simply an attractive, but unremarkable box, about two and a half inches square, placed closed on a plinth; a note on the plinth asks the viewer to open it. At the bottom of the box is a mirror reflecting the viewer's face, framed by the internal edges of the box. (Alman 2002; Ono 2005)

I knew the piece in the moment of perceiving it. I got the joke, as *a Box of* MY *Smile*, I understood how it was made, and what I understood to be Ono's intention in making it, and I continued to enjoy repeated viewings, sometimes smiling more than other times. It still makes me smile, perhaps at the comfort of knowing it is there, at being part of the exclusive conspiracy that Ono created between me and her, at seeing myself as part of her work, and at the pleasure of being able to share the work, and my enjoyment of it, with others.

A Box of Smile forms the paradigm for the camera interface of MOTION, SPEECH and VISION. It is simple and direct, requiring only three actions prior to experiencing the artwork. *A Box of Smile* was originally created in 1967, prior to computer-based interactions, when simple mechanical, interactions could cause immediate results.

Obviously, my experience was completely different to that I enjoyed when viewing Yuskavage's work. Where Yuskavage's work creates consternation and confusion, A Box of Smile creates nothing but pleasure, I experience it as being comforting and wholesome, and it elicits a complete, unerring and unequivocal acceptance of me.

Figure 5: *A Box of Smile* from the continuing authorization begun in 1984.

A Box of Smile addresses the principles discussed under Principles applied in designing the systems, on page 81. Ono created a system in which the perceiver is completely integrated with the art-object by perceiving it. By presenting a reflection of their face as they are looking into it, *A Box of Smile* represents the perceiver's response to the work, interpreting that input though a variety of filters, such as: their own immediate and personal paradigms, their understanding of the paradigms of interactive art and the Fluxus movement, and the socio-political paradigms that they recognize.

At this point their interaction with the work is mapped directly onto the art-object, causing a direct and unique integration between it and the perceiver, in which the artist, object, and perceiver have an equal relationship.

When the perceiver stops viewing the art-object, the artwork ceases to exist. If they return to view it again it provides a new version of itself, reflecting an immediate, current image of their face, just as any return to MOTION, SPEECH and VISION will be a new version of that artwork.

A Box of Smile represents an exact transferral of the gestures of the perceiver to the gestures depicted in the art-object. While Ono's process has one possible result (that the perceivers perceive themselves in the act of perceiving the work), the perceiver has the greatest influence over what they see.

The ease of interaction with *A Box of Smile* is reflected in the design of the camera interface for MOTION, SPEECH and VISION: there is no need for the perceiver to do anything other than to be in a position to perceive the art-object.

In *A Box of Smile* the perceiver adjusts the art-object simply by applying their attention to interacting with and perceiving it. Just as the perceiver's interaction with *A Box of Smile* is fundamental to the existence of that work, this interaction is fundamental to the existence of each of MOTION, SPEECH, and VISION.

Intangible compositions: Imaginary Landscape No. 4, & 4'33"

John Cage's radio piece *Imaginary Landscape No. 4*, (1951) and the performance piece *4'33"* (1952) do not exist outside of their immediate performance, the performance that is currently being perceived. While *A Box of Smile* forms a template for the art-objects MOTION, SPEECH, and VISION, Cage's works indicate the possibility of an intangible artwork.[27]

Imaginary Landscape No.4

William Duckworth remembers that

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[27] In this section the voices of Cage and other commentators are used more than when discussing other works, as their various positions and comments offer insights to the creation, perception and interpretations of these works, and the tripartite nature of this process is important to my project. Cage's work is discussed further in Cage, the Differend, the Context, the Self, and Theatre Piece No 1, page 58.

Imaginary Landscape No. 1 "was designed for performance in a radio studio, subsequently to be recorded or broadcast. The score calls for four performers who employ two turntables with Victor frequency records of constant and variable frequency, a large Chinese gong, and a string piano. The results of the performance efforts are picked up by two microphones and relayed to an assistant in the control room who controls the relative dynamics." (Kostelanetz 1986, p. 216)

Imaginary Landscape No. 1 was designed for dis-located presentation, in which the perceiver is not located at the performance site. *Imaginary Landscapes No. 4* is the opposite, being designed for located presentation, with the perceiver present at its performance/creation, it is made for radio, and by radio.

Douglas Kahn gives a description of the premier performance of *Imaginary Landscapes No.4*.

[In her] 10 May 1951 diary entry Judith Malina wrote about a concert in which there was a performance of "Imaginary Landscape No. 4 . . . scored for 12 radios and 24 players. Silence is an important component." After the concert the instruments are moved out to the sidewalk and a friend drives up in a hearse to take them away.[28] (1997, p. 560)

If it were performed now *Imaginary Landscapes No.4* would vary significantly from that premier performance. André Chaudron comments on it, saying "When one listens to the work, it is obvious that one cannot predict what will be heard, which is exactly what Cage was aiming at with this composition." (2006. para. 3) Cage has created a situation in which the perceiver, performer and composer are each engaged in a new experience as it is unfolding.

My understanding of the work developed while driving from Phoenix to San Diego in 1993. I set the car radio to scan and it took a long time to get from one end of the dial to the other. I heard many languages, dialects, opinions and music; leading me to reinterpret Cage's art-object as an indicator of social, cultural, temporal and locational change.

4'33"

"… silence is not acoustic. It is a change of mind, a turning around. I devoted my music to it."(Cage 1989, para. 17)

After discussing *Imaginary Landscape No. 4* Charles Hamm (1997, p. 289) quotes Cage as saying:

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[28] Other recollections of the piece by contemporaries of Cage, and page one of the score, are given in Descriptions of the premier performance of *Imaginary Landscape No. 4*, page 204

composing's one thing, performing's another, listening's a third. What can they have to do with one another?" In this piece it becomes everyone's job--the composer's, the performer's, the audience's-to "hear the sounds as belonging together," to experience how the "coincidence of events in space and time" can be perceived as expressing a "peculiar interdependence of objective events among themselves" affected by "the subjective states of the observer," rather than concerning themselves with "how [musical] events evolve out of one another."

Hamm continues:

> The only possible next step for Cage was 4'33", his so-called "silent piece" of the following year, which accomplished more or less the same thing as Imaginary Landscape No. 4 but with much less bother to composer and performer, and in seven seconds less time.

4'33", the apparently 'silent piece' has been considered from many different paradigms and aesthetics. Its first performance was problematic for audiences, as it did not fit their preconceptions and expectations; and it continues to polarize listeners. Cage said;

> I think perhaps my own best piece, at least the one I like the most, is the silent piece [4'33" …] It has three movements and in all of the movements there are no sounds. I wanted my work to be free of my own likes and dislikes, because I think music should be free of the feelings and ideas of the composer. I have felt and hoped to have led other people to feel that sounds of their environment constitute music which is more interesting than the music which they would hear if they went to a concert hall.

Regarding the audience reaction, Cage says:

> They missed the point. There's no such thing as silence. What they thought was silence, because they didn't know how to listen, was full of accidental sounds. You could hear the wind stirring outside during the first movement. During the second, raindrops began patterning the roof, and during the third the people themselves made all kinds of interesting sounds as they talked or walked out. (Kostelanetz 2003, p. 70)

In *4'33"*, Cage places an audience psychologically primed to listen attentively to an aural environment created by musical instruments. This is a typical concert paradigm, and Cage directs that attention to the un-constructed aural environment they are inhabiting.

Interpretations

4'33" is very open to interpretation and perhaps overly interpreted, and not just by Cage; I have two interpretations:

- *4'33"* is the most difficult of performance pieces – the performer does not have the crutches of 'notes to play', or the capacity to hide behind or impress with virtuosity – the performer must embrace and celebrate the nakedness of the piece, their nakedness as performer, and engage the audience in their nakedness too. When we are moved by a piece of music, text, or any other art work, temporal or not, we are moved by the performance of the object in the act of being performed, and this creates the artwork. For a performance to achieve this without playing a note is the greatest challenge.

And

- 4'33" is the best surround sound/immersive audio work. It is a challenge to the performer and audience. The concert programmer/curator in fact creates the piece, as they select the environment that immerses the perceivers.[29]

Either of these interpretations is as arguable as they are valid, and each is based on my own paradigms, creating an experience that resonates in me.

Seth Kim-Cohen (2009, pp. 159 - 163) lists three possible inspirations for the creation of *4'33"*, each mooted by Cage, ranging across: an attempt to keep up with the ideas put forward in Robert Rauschenberg's white paintings, his experience in the anechoic chamber at Harvard University, and his interest in Zen Buddhism. Kim-Cohen goes on to say "I rehearse theses now-familiar apocryphal accounts not to further the myths they establish … [but] to interrogate the myths and meanings they transport." (p. 162)

Christopher Shultis quotes another precedent (also mentioned by Kim-Cohen), from Cage:

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[29] These are my own interpretations/opinions of the art-object and should not be confused with quotes form others.

> I have, for instance, several new desires (two may seem absurd but I am serious about them): first, to compose a piece of uninterrupted silence and sell it to the Muzak Co. It will be 3 or 31/2 minutes long; these being the standard lengths of "canned" music and its title will be Silent Prayer. It will open with a single idea which I will attempt to make as seductive as the Colour and shape and fragrance of a flower. The ending will approach imperceptibility (Shultis 1995, p. 319).

Douglas Kahn also quotes Cage:

> I had applied to be in the music section of the WPA, … [and] I was employed in the recreation department, and that may have been the birth of the silent piece, because my first assignment in … a hospital in San Francisco [entertaining] the children of the visitors. But I wasn't allowed to make any sound while I was doing it, for fear that it would disturb the patients. So I thought up games involving movement around the rooms and counting, etc., dealing with some kind of rhythm in space. (Kahn 1997. p. 561)

Kim-Cohen, Shultis, and Kahn indicate not only the differing ways in which the perceiver may interpret an art-object, but also how its maker can interpret the object that they have made. And these descriptions of the genesis of *4'33"*, while all different, are as valid as the interpretations of it I posited earlier.

Shultis's position is also important to highlight regarding Cage's process:

> It was Cage's use of chance operations that made possible a formal design to place the silence in. And when one listens to the silence of 4'33", one hears nature. However, following nature in her manner of operation proved to be problematic for Cage. He realized that even though 4 '33" was made solely of nonintended sounds, he was still providing the frame. Even if, as in the case of 4'33", the length of that frame was chosen nonintentionally through chance operations, Cage was still making a fixed object (p. 319).

And Cage has offered these descriptions of the composition process:

> I didn't know I was writing *4'33"*. When I wrote *4'33"*, I was in the process of writing the *Music of Changes*. That was done in an elaborate way. There are many tables for pitches and durations, and for amplitudes. All the work was done with chance operations. I built it up very gradually, and it came out to be 4'33" -- and I just may have made a mistake in addition. (from Cage 1990; in Solomon 2002, Composition section, para. 34) [30]

And

> I wrote [4"33"] note by note, just like the Music of Changes [1951]. That's how I knew how long it was when I added the notes up. It was done like a piece of music, except there were no sounds -- but there were durations. It was dealing these -- shuffling them, on which there were durations, and then dealing them -- and using the Tarot to know how to use them. The card-spread was a complicated one, something big.

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[30] An audio version of Cage's Norton Lectures, from which this quote comes, is available at http://www.virtual-circuit.org/audio/Cage/Cage/Lectures.html

> [Question: Why did you use the Tarot rather than the I Ching?]
> Probably to balance East with West. I didn't use the [actual] Tarot cards, I was just using those ideas; and I was using the Tarot because it was Western, it was the most well-known chance thing known in the West of that oracular nature (from Fetterman 1996; in Solomon 2002, Composition section, para. 45)

The piece also has had two versions, the first composed in 1952 and made up of three movements of chance determined durations of 30", 2'23" and 1'40", and the second version 33", 2'40" and 1'20" (Solomon 2002). This difference indicates the possibility that Cage recomposed the piece with almost similar outcomes, or that an error was made at some stage.

Environmental noise

Stan Link sees adding noise to the usually pristine sound of digital recording as a process of locating and adding 'authenticity' to the recording. He discuses *4'33"* as situating the listener in a noisy, extra-musical environment, saying

> In a process dating at least to Wagner's descent into Nibelheim, music has been forging a relationship to extra-musical sound in an attempt to incorporate that sound. (Link 2001, p. 41)

Modernist strategies are, in that sense, all oriented towards noise's conceptual redefinition or elimination: technology attempts to suppress it, composers have promoted it to a musical resource, and Cage, most elegantly, pointed attention to it.

4'33" is a decisive amplifier of noise into signal. No longer to be avoided or disregarded, noise was now an object of both attention and intention, with the potential to be considered musical.

The noise being referred to is actually not 'noise' in the traditional sense of unwanted, random or meaningless sounds or disturbances, or something that distracts from the intended communication, but is in fact the sounds of the environment the audience is inhabiting. This environment is celebrated by elevating it into a concert performance piece. Peter Gena describes the piece thus:

> 4'33" acts as a time grid for the fortuitous sounds in the performance space just as [Rauschenberg's] White Paintings serve as a ground for incidental light and shadows. The horizontal time-space specifies no intentional events except vertical bar-lines which indicate beginnings … and endings (i.e. 30"). A performance of the piece works only in the context of a concert when the audience does not purposefully contribute to the ambiance. Similarly, the objective of the White Paintings would be abused by anyone intentionally attempting to project silhouettes on the canvas. Silence is allowed to emerge over sound, and vice-versa, … 4'33", like Cage's works with determinate notation, frees music without leaving performers to their own devices (1993, para. 18).

Non-performed performance

It is also important to consider the performative aspect of 4'33". A variety of video versions, and responses, are available on you tube. I will consider two, one performed by the BBC orchestra at the Barbican Centre[31], and the other performed by David Tudor[32]. Both show the degree of attention the performer must apply when performing the piece. There are few instructions, especially when compared to that of a traditional score, but this does not reduce the performance intensity required to maintain the integrity of the composition, and to communicate that to the audience. As with any performance the performer must hold the audiences attention just as they would when performing a more traditional piece, and this is difficult as the musical content which usually holds the audience's attention is not available. At the same time the performer must not draw attention to themselves, instead guiding the audience's focus to the sounds that they are hearing.

While many performers take the central role of a performance, in many respects their actual role is as a conduit or interpreter of the score they are performing. The quality of a good performance is one in which the performer has contributed to the author's intentions in a meaningful way. While the traditional score has very clear instructions regarding the sounds to be heard, the performer brings those sounds into actuality through their interpretation; the same can be said for any other interpretive art form such as acting or dance. 4'33" requires the performer to focus the audience's attention to the sounds they hear in a most rigorous and uncompromising way.

Concluding comments

The artworks discussed above fit broad categories, the first as objects, the second as potentials. The tissue connecting them is that, in my experience, they all contain and reconcile oppositions.

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[31] http://www.youtube.com/watch?v=hUJagb7hL0E Performed by the BBC Symphony Orchestra – 2004

[32] http://www.youtube.com/watch?v=HypmW4Yd7SY&feature=related date and venue unknown

Zero Radius, Fragmente – Stille, An Diotima, and the collection *True Blondes* are considered regarding the affect that they cause. I, as perceiver and interpreter, captured and redefined the objects, personalizing and claiming them, creating a mutual authorship of my experience of them.

These objects also exist as a recording, a score and/or recorded performance, or as paintings. They are tangible, and it is possible to re-experience them as they were created by anyone at any time[33].

In *Zero Radius* the experience generated in me is the creation of great energy and of great stillness, yet these oppositions are complementary. In *Fragmente – Stille, An Diotima* it is the reconciliation of silence and sound, as mentioned by Gorodecki, and the sense of internal and external worlds encroaching on each other and being gently permeated. Here these oppositions are fused into a single experience.

In *True Blondes* being simultaneously "titillated and offended" created strong internal philosophical oppositions. However, unlike *Zero Radius* and *Fragmente – Stille, An Diotima*, the works did not reconcile these oppositions. Instead, I, as perceiver, was forced to create any reconciliation between these oppositions.

For me, the core of these three objects is the presentation of oppositions, and the core of my experience is the reconciliation of them.

A Box of Smile sits between the previous tangible objects and the fluid *Imaginary Landscape No.4* and *4'33"*.

It is a tangible object possible to re-experience, but its contents are unique to the moment of perception. While the object's title may predict what the perceiver may see, their interpretation of it is unpredictable. Ono makes the perceiver the integral focus of the art-object, and any interpretation made of *A Box of Smile* reflects that focus.

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[33] This may be mediated by location, transmission method, and/or performer interpretation, but any consideration of those aspects is done in relation to a previous iteration of the object.

The oppositions here are those created in the perceiver, and, like Yuskavage, Ono makes any reconciliations the responsibility of the perceiver. This is a function of those art-objects being Immutable and Static, yet the experiencing of it (though requiring a physical action and an ever-changing content) is Temporal and Mutable.

Imaginary Landscape No.4 and *4'33"* take this further; they amplify the perceiver's environment, and require that they interpret it and their response to it.

The sounds heard in *4'33"* represent the local visible environment, what the audience can see as their surroundings, and the oppositions caused are in the interplay between the paradigms of the 'concert', a fully mediated sonic environment, the unmediated sounds of the 'concert hall' environment, and the paradigms the perceiver takes to these.

While this was not expected at the first performance of *4'33"*, perceivers now engage with the object in reference to its history and expectations of what they will hear. It now has the paradigms of a standard concert piece. While the actual sounds heard might not be completely predictable, like those of a repertoire performance, perceivers can predict what they will hear, and expect to experience. Here history provides the opportunity for reconciliation, as *4'33"* is understood within its own paradigms.

It is also clear that there are many different interpretations of *4'33"*, ranging from those of the composer to those of the many listeners.

Imaginary Landscape No. 4 represents an invisible, almost un-locatable sonic environment placed within the concert hall. There is little possibility that perceivers will be able to predict the outcomes of a performance. This unpredictability opposes the paradigms of the concert hall, and potentially allows sounds considered profane in such an environment to enter it.

4'33" allows the perceiver to deliberately experience the artwork; as the sound they hear can be easily reconciled with their expectations. This may not be the case when perceiving *Imaginary Landscape No. 4*. Instead the perceiver can only reconcile the events heard by removing any sense of prediction or expectation, and in doing so allow the events to reconcile themselves.

These examples are considered and discussed through my very idiosyncratic lens. My interpretations are just that: in some ways others support them, and in other ways they are unique.

Chapter 4: Literature/Influences – Concepts

Lyotard and the Differend

There is an inherent desire of humans to reconcile objects and events through their subjective and self-conscious, point(s) of view. This desire causes us to link objects temporally and semantically into phrases, or *gestures*[34], and through this process form relationships that might not exist other than through thee subjective and self-conscious interpretation(s). These relationships are continually nascent, existing within changing languages and codes, signifying constantly changing referents dependent on the paradigms of the perceivers.

Making an art-object is a process of forming relationships through linking understood gestures in order to create an experience in its perceiver. However, paradigmatic differences - be they unique to a process of art-making or to an individual art-maker or perceiver - can cause separation due to a lack of similar understandings being applied to an art-object or the gestures within it.

This separation, Lyotard's *differend*, occurs in "a case of conflict, between (at least) two parties, that cannot be equitably resolved for lack of a rule of judgment applicable to both arguments" (Lyotard 1988, p. xi); even though constituent paradigms may differ, they are all valid[35]. While there is not necessarily conflict between art forms there is a sense of difference and separation.

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[34] Here a gesture is considered as fitting Lyotard's phrase: to quote Claire Nouvet (2003), "A ''phrase'' for Lyotard presents a universe composed of four poles: referent, meaning, addressor and addressee. The universe of the phrase can be thus summarized: someone (addressor) says something (meaning) about something (referent) to someone (addressee). A phrase is articulated to the extent that it presents this quadrangulated universe. It should be noted that a ''phrase'' is not necessarily linguistic, and cannot simply be equated with the linguistic sentence. A gesture can also be a ''phrase.''"

[35] Childs and Fowler (2005) expand this, as "the point of difference that arises between two disputant agencies who do not possess common terms of reference within which to conduct their dispute."

The following quotes from Lyotard's introduction to <u>The Differend; Phrases in Dispute</u> are useful as they can relate to any form of communication in which differences are seen as natural, undeniable characteristics.

Lyotard's *Thesis*, (1988, p. xii) is that

> A Phrase, even the most ordinary one, is constituted according to a set of rules (its regimen). There are a number of phrase regimens: reasoning, knowing, describing, recounting, questioning, showing, ordering etc. Phrases from heterogeneous regimens cannot be translated from one into another. They can be linked one onto another in accordance with an end fixed by a genre of discourse … [At] stake in it is the two parties coming to agreement about the referent. Genres of discourse supply rules for linking together heterogeneous phrases, rules that are proper for attaining certain goals … There is no "language" in general, except the object of an Idea.

This provides a potential model for mapping between art forms. The computer, in which all referents (the input to the computer) are interpreted as binary data, provides a regulating "universal rule of judgment between heterogeneous genres [that Lyotard sees] is lacking in general" (1988, p. xi). In doing so the "language" of the art (be it visual, sonic, kinetic and/or textual art) becomes the "object of an Idea". This idea can then be mapped and represented without overt reference to its original form.

Lyotard follows his *Thesis* with a *Question* (p. xii)

> A phrase [or gesture]"happens." How can it be linked onto? By its rule, a genre of discourse supplies a set of possible phrases, each arising from some phrase regimen. Another genre of discourse supplies another set of other possible phrases. There is a differend between these two sets (or between the genres that call them forth) because they are heterogeneous.

Here a genre of discourse could be considered, for example, visual art, in which the painter's brush strokes are gestures, or the intonational modulations of an actor are gestures. However, within these genres such gestures are considered heterogeneous.

Lyotard then poses the *Problem* (p. xii)

> Given 1) that the impossibility of avoiding conflicts (the impossibility of indifference) and 2) the absence of a universal genre of discourse to regulate them (or … the inevitable partiality of the judge): to find, if not what can legitimate judgement (the "good" linkage) … .

Solving the "absence of a [regulating] universal genre of discourse" is the core of his *Problem*. Considering all referents as gestures that can be represented as data, regardless of the genre, provides a 'universal genre of discourses', and the possibility of an impartial judge, the computer.

In the following four quotes from I have removed references to 'right', 'wrong', 'conflict', 'opposition', and 'victim', in all except the first, where the terms remain[36]. While removing these terms negates this position, it offers a broader way in which to examine and potentially use his insight, and the way in which it may be languaged in a context other than conflict/difference resolution.

> A case of differend between two parties takes place when the "regulation" of the conflict that opposes them is done in the idiom of one of the parties while the wrong suffered by the other is not signified in that idiom (p. 9).

This refers to the opposition of idioms. It could be paraphrased: 'A case of differend takes place when gesture done in one idiom is not signified in an other idiom.'

> To give the differend its due is to institute new addressees, new addressors, new significations, and new referents in order … to find an expression … . This requires new rules for the formation and linking of phrases. No one doubts that language is capable of admitting these new phrase families or genres of discourse. (p. 13)
>
> The differend is the unstable state and instant of language wherein something which must be able to be put into phrases cannot yet be. [Including] phrases which are in principle possible. … [And finding] new rules for forming and linking phrases … (p. 13)
>
> In the differend, something asks to be put into phrases … . This is when human beings who thought they could use language as an instrument for communication … are summoned by language … to recognize that what remains to be phrased exceeds what they can presently phrase, and that they must be allowed to institute idioms which do not yet exist. (p. 13)

This recognises "language as a limitation of reality" and the need to create languages that will allow "what remains to be phrased" to be phrased; and new idioms, possibly built from those languages.

This language need not be 'new', in the sense of not previously existing, but can be a new fulcrum for linking gestures[37]. This project is an attempt to form such a language.

Derrida saw the *Differend* as the

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[36] Lyotard used the Holocaust as a frame for his argument, this is discussed briefly in Chapter 4 Appendix, on page 212.

[37] An example that shows how the same regimens may be expressed in Dance and Text is shown in Chapter 4 Appendix, page 213.

> dispersal of sentences … , since what they forever lack – and this is the very point of The Differend – is the very horizon of a consensual sense, of a translatability, of a possible 'to translate'. What is lacking … is the horizon, or even the hope of … ever receiving a common sense. (Derrida 2000, p. 33)[38].

Considering it as "the very horizon of a consensual sense, of a translatability, of a possible 'to translate'", it becomes the meeting point at which consensual sense and translatability become possible. Recognised as such it provides the liminal point where consensus can be reached, thus allowing mapping or 'translation'.

By considering the *gesture*, whatever its form, as the 'consensual horizon', it provides a mutual 'rule of judgement' applicable to the conceptualizing, reification, interpretation and experiencing of art-objects.

Jakobson, Context, and Mediation

Lyotard's understanding of the *differend*, and the linkages that addressors and addressees form when communicating between regimens, relates to Roman Jacobson's (1960, p. 353) description of message transferral:

> [The] ADDRESSER sends a message to the ADDRESSEE. To be operative, the message requires a CONTEXT referred to [the referent], seizable by the ADDRESSEE, and either verbal or capable of being verbalized; a CODE fully, or at least partially, common to the addresser and the addressee; and finally, a CONTACT, a physical channel and psychological connection between the addresser and the addressee, enabling both of them to enter and stay in communication.[39]

In many situations the message is entirely reliant the context, channel and code: euphemisms, metaphors, or double entendres provide examples of this. Here any phrase or utterance is interpreted according to a specific, present, and immanent code within an immediate context and via a currently agreed channel.

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[38] As with much of the discussion in Lyotard's book, this relates to the "Jews of the Diaspora [who] form, or believe they form, a community of the Diaspora, they are gathered together by this principle of dispersal. … Whereas the dispersal of sentences is worse than evil …" (Derrida 2000, p. 33).

[39] It is also possible that messages are not either verbal or capable of being verbalized; much of art making is based on trying to convey messages that are best not conceptualized or conveyed via verbal transmitters; yet art is very much discussed in this medium.

In abstract arts, such as sound art and dance, the message is often not "either verbal or capable of being verbalized", and this is where their power lies. Here the context, code and channel decide the how the art-object is perceived, and its value within that and other contexts.

Gene Doty's (2009) representation of Jakobson's model, shown in Figure 6, below, referencing writers transmitting to readers, includes addition of noise to the information being transferred. Here noise "may be a gap, a distortion, creating confusion as to the sound, code, context or meaning" (Whiteside-St Leger Lucas 1993, p. 12): the extraneous elements to the intended communication, that influence the outcome of the intended communication.

Figure 6: Jakobson's model of communication between writer and reader (Doty 2009)
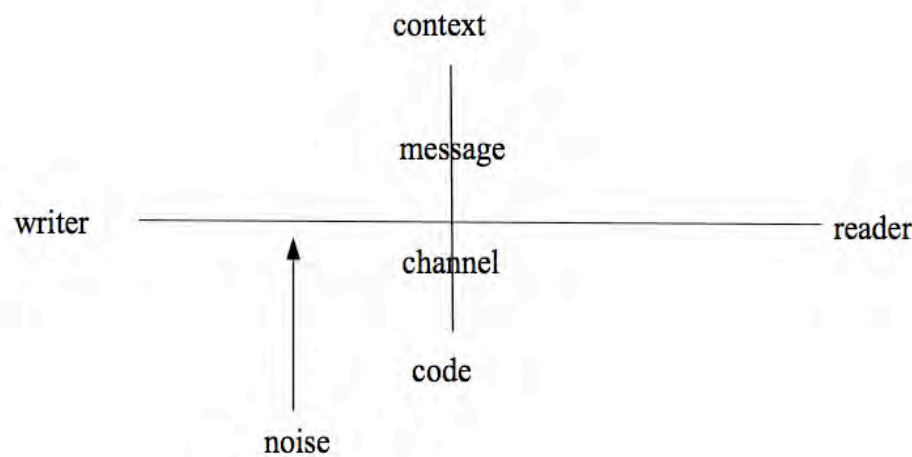
In Figure 7, below, based on Doty's graph, the circles surrounding the intended message signify the encompassing nature of the contexts, channels and codes, all of which mediate all communications. As the sender and receiver maintain their own 'rules of judgment', (assumptions of the current and immediate 'genres of discourse', systems of 'reasoning, knowing, … recounting … ordering' and so on) they can never be sure of the effect those various mediators on the intended communication outcome.

The Möbius strip is a metaphor for this problem; here both participants in the act of communication are irrevocably on their own side of the strip yet, as with the Möbius strip, that side is the only side. Sender and receiver, maker and perceiver are both simultaneously in the act of making and perceiving the intended message within the contexts, code, and channels they are in the act of inhabiting[40].

Figure 7: Systems in which communication occurs, showing the Möbius-like interaction between the sender, receiver, and the environments in which the communication occurs.
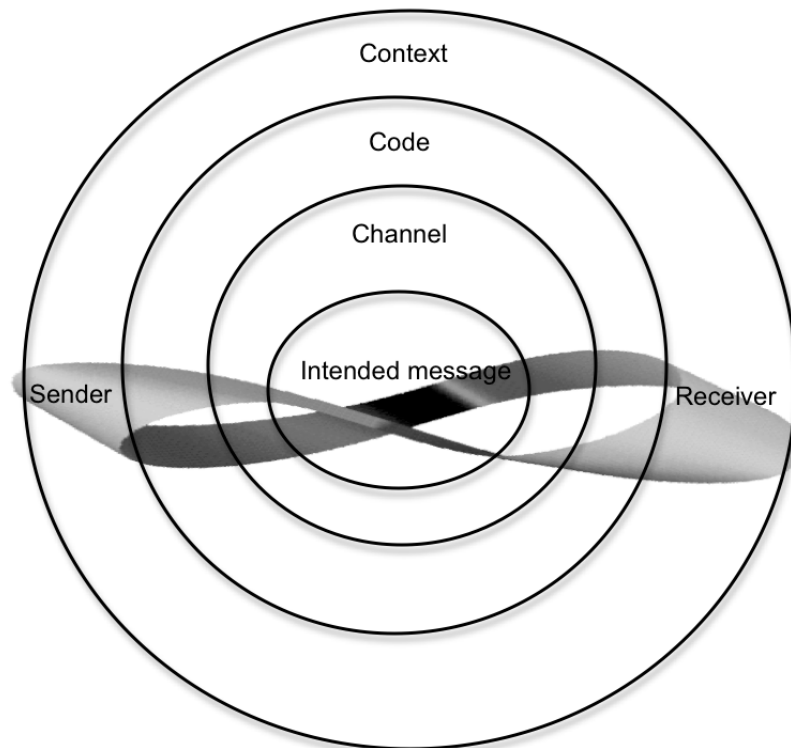
[40] The paradox of the Möbius strip is that following a path, or drawing a line on one side of the strip results in arriving at a point on the opposite side of the strip to where the path or line began. This demonstrates that there is only one side to the strip, but when grasping it, it is clear that opposite sides of the strip can be contacted. This metaphor subverts the dichotomies of art maker and art perceiver, folding them into being simultaneously art-maker/perceiver and art-perceiver/maker.

The communicators generate the contexts, channels and codes influencing the communications, often consciously and with a degree of agency; and yet these codes also subscribe to prescribed externally generated rules. Therefore, as the sender and receiver transmit and interpret any gesture or phrase, not only are they are both prisoner and guard of those encircling elements, they (and the message) are also questioning, and being questioned by, the intended message as the message is either being reified, transmitted, or received. Also, while they may choose the contexts, codes, and channels that they wish to exploit in order to communicate, the act of choosing circumscribes the capacity to communicate.

This image indicates the pervasiveness of Jakobson's (Jakobson 1960)three mediators, and how they blend and influence the intended communication, or phrase, from all directions, all providing 'noise' that is a constant influence. It is the noise that facilitates the blending of differends, forming litigations that can be used to immediately generate common rules to the sender and receiver *in situ* for the interpretation of the present phrases or gestures.

The gesture is the rule that translates the differend into a litigation. Here the differends relate to the various art forms being considered. While a painter may not be versed in the practice of dance, a writer in the making of music nor a musician in the making of film they all use a phrase or gesture as their immediate currency of communication.

The processes introduced in Figure 6 and Figure 7 are expanded on in Figure 15, Figure 16 and Figure 17 under Concepts on page 75, in Chapter 6: Creating the , when discussing the interface design for MOTION, SPEECH, and VISION.

Cage, the Differend, the Context, the Self, and Theatre Piece No 1

> My work became an exploration of non-intention. To carry it out faithfully I have developed a complicated composing means using I Ching chance operations, making my responsibility that of asking questions instead of making choices.(Cage 1989, para. 17)

Choices are essential to the *differend's* existence, and Cage sought to remove them from his paradigms. In doing so he reduced the sense of difference and created the possibility of concept and separation essential to the *differend*. He also created the possibility of a Möbius-like interaction between Jakobson's sender and the receiver, in which the interaction is in continuous, reciprocal flow.

John Cage, Merce Cunningham, and Robert Rauschenberg worked together on a number of performance works. While the result of their efforts was always a single performance-based art-object, their process was quite individualized, each working separately in their areas of expertise, with the results being presented simultaneously as a coherent work[41].

Peter Gena (1992) described the beginning of this collaborative process as being *Theater Piece No. 1* (Cage 1952) [42], presented at the Black Mountain College in 1952; Gena also considered this mixed media event as the inception of the art form called 'happening'.

Joan Truckenbrod (1992) saw it as transcending the boundaries between art media, with the use of chance methods in its composition allowing great freedom for the performers.

This set a tone for many of the collaborations between Cage, Cunningham and Rauschenberg. Their process developed from the 1940's, when their work intersected at specific moments, evolving to having no interaction in the composition of the choreography, music and décor, to the point where these elements were first revealed at the premier performance of the work (Miller 2001).

This indicates an understanding and possible exploitation of the ability of an audience to draw links between ostensibly different and unaligned elements. This requires the audience to make their own connections and to generate their own understanding of the relationships between the presented elements; and each audience member consequently develops a unique and individual understanding of the work.

Barbara White described the process.

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[41] An example of this process is discussed by Michelle Potter and Carolyn Brown under Interaction, time and space on page 208

[42] This piece is also known as *Black Mountain Piece*.

Cage and Cunningham practiced the acceptance of multiple and disparate streams of stimuli. But in disparity we find unity, or relationship, if we believe that any unity comes in the spectator's reading or that the witness's "polyattentiveness" [described as "the simultaneous apprehension of two or more unrelated phenomena"] may lead to a more generous, expansive kind of wholeness. Wholeness need not be agreement; it may be an "approximate state of wholeness that lacks perfection" but that embraces completion, presence, the "suspension of opposites," the integration of complements (2006, p. 86).

This "polyattentiveness" assumes that the audience is able and willing to divide their attention when apprehending the performances. It requires that they perceive all elements of a performance as having equal importance and value, that they then guide their attention as they see fit; and the, after that division of attention, re-synthesize what they perceive, creating and then experiencing a coherent whole.

Theater Piece No 1 offers deliberately un-predetermined sequences of events and objects; *gestures* from potentially heterogeneous regimens, to be interpreted through applying similar phrase regimens, and thus creating relationships. In doing so Cage created a situation where the onus fell to the perceiver to create a possibly unique language, context and/or code, in order to experience, interpret and reconcile the objects of that *Idea* through their own regimens, or paradigms.

 In this case those more adept within the performative, visual, and temporal regimens of dance, for example, are potentially required to take those understandings into other realms of the invisible regimens text and music/sound; and vice-versa.

This process may be represented through the diagram in Figure 8, page 59, which shows the two potentially heterogeneous regimens (HR) of dance and text. While the terms in each regimen are identical the understanding and expression of each term is significantly different. However it is the term itself that may cause homogeneity and connection.

Figure 8: Potentially heterogeneous regimens (HR) in Cage's *Theatre Piece No. 1*
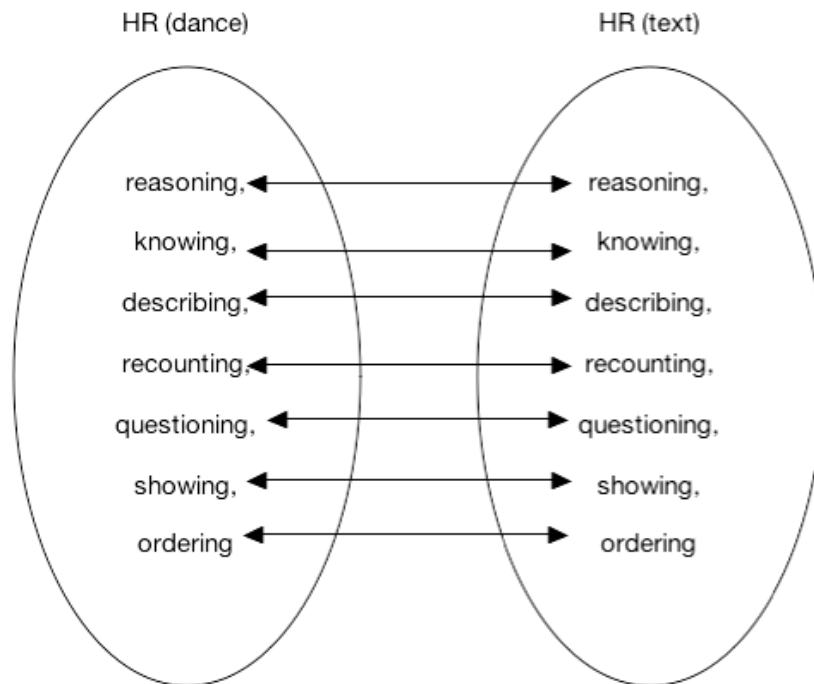
Here the two heterogeneous regimens shown represent two of the many elements of Cage's *Theater Piece No. 1*. When considering the many other elements present in the piece, the perceiver develops their idiosyncratic experience of it through using the tools Lyotard (1988) has mentioned as *phrase regimens*, in an attempt to make sense of the events and objects they perceive. It is also the case that any of the regimens will mutually influence each other, causing quite intricate webs unique to each perceiver.

In each of the regimens given in the example above, there are specific processes for using any or each of the 'phrase regimens' contained in each heterogeneous regimen. Each requires a body of specific knowledge, which is interpreted in specific and idiosyncratic ways by the perceiver.

When Cage created the work there were no intended or predetermined relationships between these regimens other than temporal and physical location. Any other relationships are those generated by the perceiver while perceiving the event, and possibly those developed by the maker/performer in response to the events that they perceived while engaged in their part of the performance, making the performer also a part of the audience. This integration of influences is shown in Figure 9, below.

Figure 9: Integration of influences between elements in *Theatre Piece No. 1*
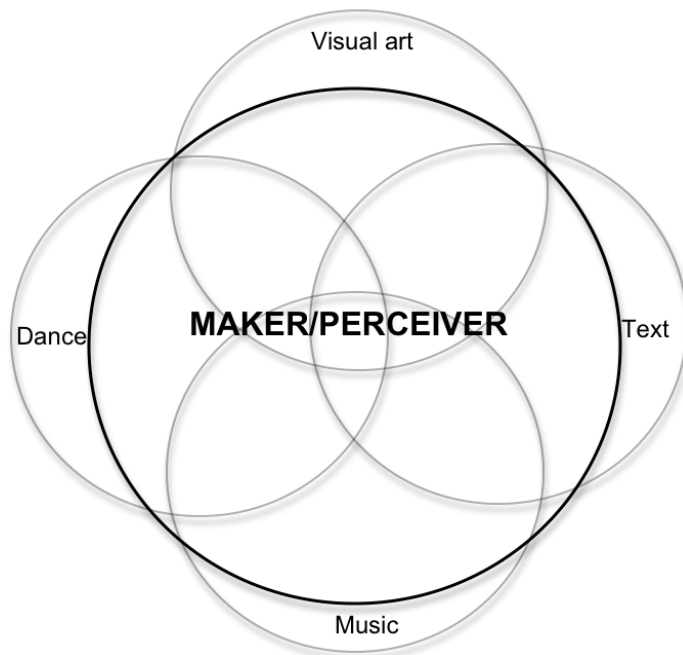
In *Theatre Piece No. 1*, Cage obscured the notion that a regimen may be 'wronged' by placing the various 'genres of discourse' (Lyotard 1988)ß in the same experiential location, causing the perceiver to link the elements of the various heterogeneous regimens that collide and blend in the work. He did this by forcing the perceiver to create a language *in situ* that did not form a 'limitation of reality' but instead caused the perceiver to form their own 'litigations', creating their own phrases and forming common 'rules of judgment' to reconcile the events.

Cage's *4'33"* (1956), *Imaginary Landscape No. 4* (1951), and *Radio Music* (1956) are examples of the *situ* creating the work, and the audience being required to immediately develop the code(s) through which to perceive and experience the work. These codes constantly evolve as new listeners bring new cultural understandings.

Cage said his "work became an exploration of non-intention", an attempt to remove himself and his subjectivity from the creative process, and thus the creation, of the work.

> [For] Lyotard this destruction has in itself a positive content in emancipating us from subjectivity, and in this it in fact remains close to Cage, for whom the experience of the void and silence should be understood not as a loss of subjectivity, but as opening to other capacities for change: "self-alteration not self-expression," as he says in one of his last texts. (Wallenstein 2010, p. 86)

Concluding comments

This chapter considers aspects of the art making and perceiving process. Lyotard brought up the fact that there must be an accepted and mutually held agreement before any meaningful transference of ideas can occur, and Jakobson's description of message transferral puts forward that the context in which any communication occurs has a fundamental impact on the message that causes the act of communication.

These positions are simultaneously supported and denied by *Theater Piece No. 1.* Here Cage creates a work that requires the various regimens of the performers to be acknowledged, and for their heterogeneity to be blended to create a homogenous outcome by the audience. This occurs because Cage creates a context in which this transgression of boundaries is required.

John Lechte (1994, p. 250) summarized a portion of Lyotard's *differend*, saying "A silence, an interjection, a shrug of the shoulders are all phrases. Moreover, there is no first or last phrase because there is always a linking of phrases." However, "Silence, an interjection, [or a] shrug of the shoulders" can have many possible definitions and significations; and any understanding of these is almost fully dependent on the perceiver's interpretation, within their present 'genres of discourse', 'rules of judgment' and so on.

The perceiver generates their language, regimens, codes etc. in the moment of perception, just as the author creates regimens and codes at time of conception. However, the linkages made are prescribed by the syntaxes that the perceiver simultaneously applies to what they perceive. This is what allowed *Theater Piece No. I* to be considered a work of art at the time of its conception and presentation, and why it continues to be considered thus. Cage removed the ego that causes the contexts in which the differend occurs by considering all elements of equal value. He did this through a context, art making, which is simultaneously innocuous and profoundly influential.

Using computer technology in the arts creates systems that allow these regimens to be transgressed in both the act of creation and perception. It creates a context in which the 'suspension of disbelief' is no longer required, as the realities that require belief are continually in flux.

However, it is a human characteristic to try to make sense of events that we experience, even if the process of 'making sense' states: "it doesn't make sense".

For a maker, post modernist thought allows and validates: bricolage, the invention of idiosyncratic codes and rules, and the authority of the self, drawing heterogeneous webs. As Aylesworth notes "the subject moves from position to position, now as sender, now as addressee, now as referent, and so on."(2005, section 2, para. 4); and 'subject' can be understood in all of its possible definitions.

Chapter 5: Literature/Influences – Systems

This chapter considers Kansei as a system for developing and appreciating art-objects through focussing on its intangible and ineffable qualities, and Notation, as a system for capturing and defining those qualities through representing them in a form different from the original object. They relate directly to this project, as the notation of an art-object allows its abstraction and reinterpretation, and Kansei celebrates what cannot be captured or easily described. These oppositions may form a *differend*, one that MOTION, SPEECH and VISION attempt to transcend.

Kansei

Kansei "comes from a Japanese word, meaning sensibility, sentiment, susceptibility, the sense, emotion and/or feeling. [Corresponding] with Pathos, in contrast to Logos … [the] essence of Kansei communication is communication of intention and emotion using patterns with presence." (Inokuchi 1999, p 311)

The term is continually redefined according to the approaches of different researchers (Lévy, Lee et al. 2007, p. 2). They proposed that:

> [There are] five major dimensions of Kansei:
>
> *Kansei* is a subjective and unexplainable function.
>
> *Kansei*, besides its innate nature, consists of the cognitive expression of acquired knowledge and experience.
>
> *Kansei* is the interaction of intuition and intelligent activity.
>
> *Kansei* is the ability of reacting and evaluating external features intuitively.
>
> *Kansei* is a mental function creating images. (p. 7)

And synthesized their research to conclude that:

> *Kansei* process gathers the functions related to emotions, sensitivity, feelings, experience, intuition, … including [the] interactions between them.
>
> *Kansei* means are all the senses (sight, hearing, taste, smell, touch, balance, recognition...) and – probably – other internal factors (such as personality, mood, experience, and so on).
>
> *Kansei* result is the fruit of *Kansei* process (i.e. of these function processes and of their interactions).
>
> It appears to be a unified perception providing a qualitative meaning and value of one's direct environment. In other words, *Kansei* result is how one perceives qualitatively one's environment. Therefore, *Kansei* result is a synthesis of sensory qualities. (p. 10)

Lee, Harada and Stappers (2002) discuss the concept as a way to generate a relationship between the object and the viewer that transcends utility, seeing it as a way to influence the emotions beneath behaviour and attitude. An outline of *Kansei*, and its complement *Chisei*, is shown in Figure 10.

Figure 10: Description of *Kansei* and *Chisei* (Lee, Harada et al. 2002, p. 220).
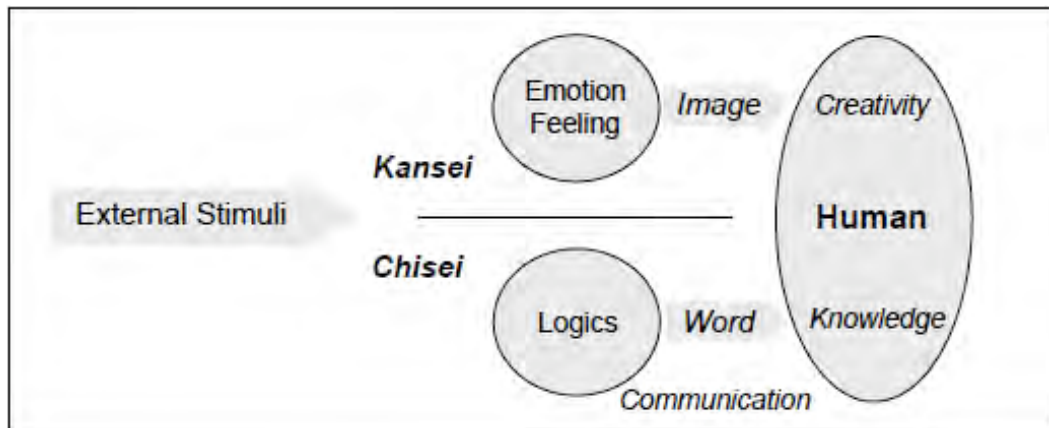
This diagram could be seen as referencing the roles of the left-brain and the right brain, which collaborate to develop and create a holistic understanding and appreciation of an event or stimuli.

The etymology of the *Kansei* and *Chisei*, as shown in Figure 11, below, indicates the differences between the two well.

Figure 11 Kansei etymology (Lévy, Lee et al. 2007, p. 8)
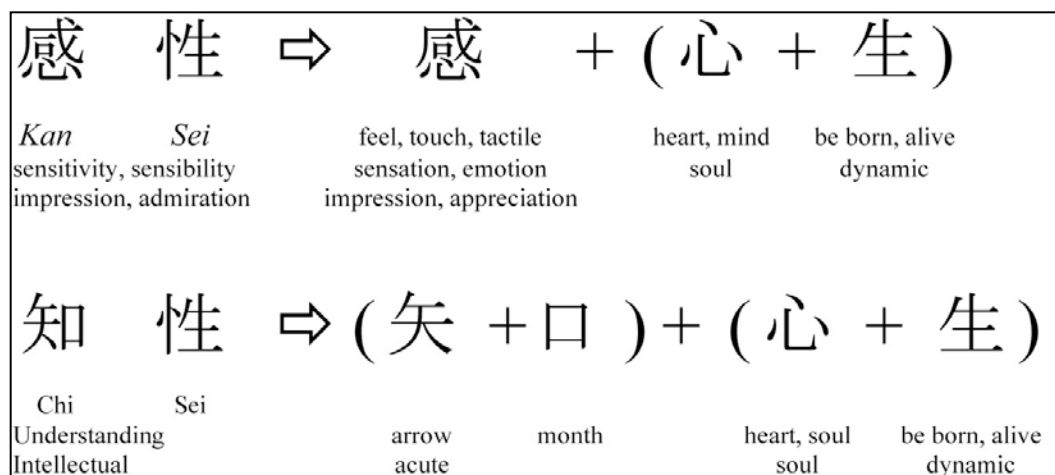
These two figures offer useful ways to understand the terms by referencing the metaphors that reside in Chinese ideograms, such as *Sei* which blends heart, mind, soul and to be born, alive and dynamic. While Lévy, Lee and Yamanaka find Harada's 1998 definition overly complex and opaque for their purposes, it does, after adding the above information, give a strong sense of direction in understanding the term, particularly when considered as being equally engaged in the construction of intuitive creation of and reaction to external stimuli.

While there is much literature on *Kansei* its basic premise can be encapsulated as an intention to both blend and transcend function and aesthetic in single form. That "*Kansei* result is the fruit of *Kansei* process" indicates that it is a looping system, similar to that of a directed Möbius loop, one through which the heart, mind and soul become alive and dynamic[43], it may be considered a causal agent in the creation of art-objects, and notation as a representation of them.

Notation

Notations of art-objects provide an abstraction of, or reference to, the object, they are a 'datafication'. They do not accurately represent the affect or perceived content of the original work being represented. Instead they form systems through which the original art-object can be interpreted, providing a model or representation from which it is possible to interpret a version of the original work. This interpretation may be influenced by, and perhaps be more representative of, the interpreter than of the originator of the work, or perhaps even the work itself.

---

[43] Longer discussion and examples of *Kansei* are given in Chapter 5 Appendix, page 215.

While a notation system can never exactly represent the intentions of the work's author, it does have many advantages. An advantage of a notation system, such as that used for Western musical notation, is that it creates an abstracted representation of the original material, allowing exploration and modification at an abstract and meta-morphic level. Simple processes, such as the transposition of pitches in the musical notation system, are easily done by simple addition or subtraction. More complex variations can be made through the various transformation processes considered by composers and theoreticians such as Forte (1973), Babbit (Grout 1973) Schoenberg (1978; 1985), and Morris (1987).

Notation systems for movement and visual art also exist. For example: Laban or Benesh notations[44] can outline the actions of a dancer, and painting can be represented in a 'paint by numbers' system. While these notation systems may seem arcane to the uninitiated, they are known and used in the relevant fields.

Speech notation

Symbols such as these I am using now are the most prevalent example of speech notation. However, like musical notation, they do not actually represent the sounds heard or the meanings interpreted from those sounds. An example is the difference between two written words 'pervert' and 'pervert', which have significantly different meanings and functions depending on which syllable is emphasized when the word is voiced. Speech has three forms of notation: the alphabetic symbols I am using now, phonemic symbols, and phonetic symbols, each with an increasing degree of detail. The phonemic notation of 'pervert' and 'pervert' is / pəˈvəːt/ and / ˈpəːvəːt/[45].

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[44] Examples of Laban and Benesh notations can be found on page 224.

[45] This notation is taken from the Dictionary.app provided in MacOS 10.6.6. Table 8, on page 220, gives a list of the most used phonemic symbols in English words.

Graphic Text

In *62 Mesostics re Merce Cunningham*, John Cage (1971) links the visual representation of the text on the page with the sonic representation of the text, saying that its visual representation on the page "may be used to suggest an improvised vocal line having any changes of intensity, quality, style, etc., not following any conventional rule." (Cage 1971, CD liner notes.) This offers a heightened example of the standard use of written text, which is at its essence simply a notation of the vocal utterances made to ease communication.

Figure 12: *Mesostic 59* (from Cage 1971 CD liner notes).

Concrete poetry is an example of a notation system becoming or creating the artwork itself. Eugene Gomringer's poem *silencio* (from Perloff 1991, p. 116) shows this.

Figure 13: "silencio" ("silence"), (Eugene Gomringer 1954)

```
silence silence silence
silence silence silence
silence           silence
silence silence silence
silence silence silence
```

Cage's art-object shows a relationship in which the image of the words implies more that the meaning of the words, and Gomringer's shows the possibility of the image of the words reinforcing their meaning. The converse of these two approaches may be seen in the words "taketa" and "naluma", shown in Figure 33 on page 155, which demonstrate the way in which people connect a word and an image.

Dance notation

There are two main forms of dance notation used in Western dance, Laban and Benesh. These are quite complex, each with their own idiosyncrasies and potentials. Examples of Laban and Benesh notation are shown on page 218, under Examples of dance notation.

Both notations have been considered from a computational position; as can be seen in the writing of Politis (1990), Calvert (1986), Venable (1991), Bradford and Côté-Laurence (1991), and Ryman (1984).

Laban and Benseh notation systems have not been used in the development of art-objects to the same extent as the systems of musical notation have for development of art-objects in that field. While the notation system may be as available to algorithmic manipulations as image, speech and musical notation, any articulation of the outcome must fit within the capabilites of a dancer. That said, these systems do provide possibilites for developing ideas that are then mediated by those constraints.

Musical notation

The history of musical notation is long and broad, with various cultures developing systems that best suited the style of music being made and other unique cultural aspects.

Western musical notation is seen as having its beginning in the neume, and then developing into the form commonly seen today. [46] However there are many other approaches to creating a visual representation of a sonic art-object.

The graphical music score

The musical score has evolved to include graphic elements that more transparently indicate the gesture the composer wants the musician to execute. This system is usually called the 'graphic score', or 'graphic notation', and has a great many versions and variations.

The score for Karlheinze Stockhausen's *Elektronische STUDIE II* (1954) (Hadju 2008), a section of which is seen in Figure 14 below, is a very accurate representation of what is heard. The square and rectangular objects seen higher in the image represent the frequency ranges heard, as seen on the vertical axis, and the triangular objects seen lower in the image represent the amplitude of those frequencies.

Figure 14: Elektronische STUDIE 11 (image from Hadju, 2008).
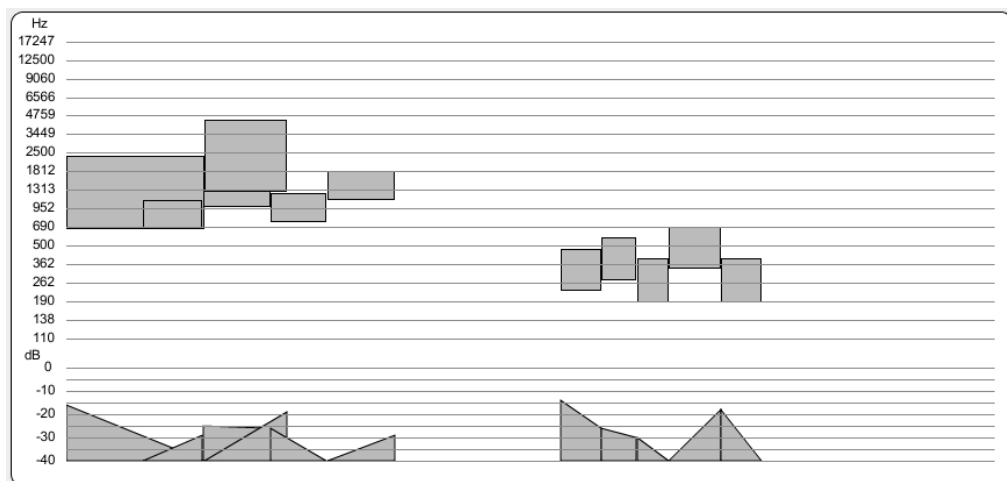
John Evarts (1968) provides a selective history of the graphic score in the 40 years up to the publication of his paper <u>The New Musical Notation: A Graphic Art</u>?. He suggests that the graphic score may in itself be considered a work of visual art, seeing the "resemblance of some of the scores to the work of painters of the last decades, such as Mondrian, Miro and Klee" (Evarts 1968, p. 405). There are many variations of the graphic musical score being used for traditional instruments, a discussion and an accompanying images are given in Examples of graphic scores, on page 223.

Image notation

Because notation is usually representing an invisible object, such as speech notated as writing and music as a score, the abstracting of an image as a notation is rare. However, paint by numbers is a system of notating a painting shown in Figure 69, Figure 70, and Figure 71. This kind of notation is similar to the notation used in visual digital technology to produce images on a screen. In this case, the colours are placed at specific coordinates in spots of equal size, with four values attached.

The digitized visual image
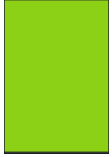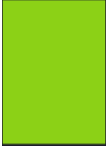
Digitally represented visual artworks are examples of the 'paint by numbers' paradigm. Here the visual image is separated into small grains that are seen as pixels on a computer screen, and each grain is given RGB values to represent its colour, with an added Alpha value to represent transparency[47]. These grains, unlike those in the 'paint by numbers' system, are of identical size and the values attributed to them instantly alterable.

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[47] The alpha value is not demonstrated here.

An example of this process is seen in Table 1, below. Here each pixel in (1) has the Red (R) value of 151, the Green (G) value of 218, and the Blue (B) value of 22. These numbers are part of the 256 numbers allocated to each of the three colours, Red, Green, and Blue (RGB)[48], making 16,777,216 possible colours.

Slight differences in any one of the three values are usually insignificant, as seen in (2), which has the RGB values 151, 218, and 23 instead of 22; this difference is not easily seen. (3) uses the same numbers rotated one group, where the R value becomes 23, the G value becomes 151, and the B value becomes 218: this indicates how a simple operation may have a significant effect.

Table 1: Differentiation of RGB values[49]

(1) RGB values 151, 218, 22		(2) RGB values 151, 218, 23		(3) RGB values 23, 151, 218	

The Moving Image

On celluloid film, the shapes and colours captured by the camera are stored as 24 still images, or frames, per second. This is an example of a granulated process. These frames may be considered as similar to the grains of sound stored on a compact disk. We synthesize this sequence of discrete still images into a continuous moving image using facilities of the eye and brain.

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[48] Other colour value systems are available in computer based systems, these include: RGB, RetinalCone, XYZ, UVW, uvY, xyY, U*V*W*, S0W*, L*HoC*, YIQ, YUV, RGBcie, RGBsmpte, HSV, HLS, IHS, L*a*b*, L*u*v*, CMY, CMYK/KCMY (black stored in alpha), I1I2I3. These are the Colour systems available in the Max/MSP/Jitter environment. Here I will use the RGB value system See http://www.cycling74.com/documentation/jit.colourspace for information on the colour space systems available in the Jitter software system.

[49] Please refer to the PDF/html files in the accompanying DVD for the colour images.

Digital technology now allows for this storage of moving images to be carried out similarly to that of sound, where the images are digitized in the ways described earlier. This means that frame change rates can be altered from, for example, every 25 frames per second (40 milliseconds) to faster or slower change rates. Frames can also be reordered according to an algorithm: any of the various arithmetic/mathematical alterations that can be applied to numbers can be applied to visual data.

Digitized aural data

Digital technology is a developing system and process for delivering an increasingly accurate representation of an object, be that aural or visual. Here the object to be represented is separated into discrete packets, or grains, of data containing varying values relating to information such as size, dimension, and type. These grains are stored, and then reconstituted to create a re-presentation of the data originally stored. They can also be seen as the smallest part of a notation system similar to those listed above.

MIDI, the Musical Instrument Digital Interface

The Musical Instrument Digital Interface (MIDI) is an example of a musical notation system. Here numbers between 0 and 127 represent pitch and velocity, allowing 128 possible pitches and possible amplitudes[50].

This pitch system fits well within tonal Western well-tempered musical traditions as each of the 128 possible pitches create frequencies that fit that pitch system (and others if desired). The 127 possible amplitudes (an amplitude of 0 creates silence) are sufficient to allow an expressive performance, and the listener can distinguish these differences as having expressive qualities.

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[50] There are other attributes to the MIDI specifications but these two elements demonstrate the concepts being outlined here.

The Compact Disc

When we listen to an audio Compact Disc we are actually hearing consecutive snippets of the music; 44100 grains, usually referred to as samples, each second, and with 65536 possible amplitudes for each grain. The same parameters usually occur in digitally synthesized music, which uses the same or similar broadcast systems as the compact disk[51].

Under Examples of sonic notation on page 227, Figure 86 to Figure 90 show time-against-amplitude graphs of a ten-second sound segment. These images are of the same sound-file, and are visualized with the audio program Audacity[52.].

Each image starts from the same point in the sound file, and then extends for the given duration. Figure 90 shows the individual samples as little dots along the line extrapolated by the program to join each of the individual samples; this is an example of splitting a signal, usually a stream of information perceived as continuous, into small grains, that are stored as digital information and later retrieved and transmitted.

Figure 91: Other images of a sound, shows four different digitized images of the same sound segment. All of these images are standard visualizations of sound, used by scientists, musicians, and ethnomusicologists.

Each of these images demonstrates ways in which one media is represented in another; Figure 90, for example, could be seen as a horizon line in a landscape painting, or as a track of the motion of a hand in dance.

The power of notation systems

By translating the sound of musical expression into symbols on a page (notes), these sounds become available for manipulation through a wide variety of systems, and for conversion or translation from their original form into a different form. Table 10, on page 226, shows processes of altering pitches through arithmetic operations.

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[51] A wide range of sample rates, bit depths, and codecs are used in computer-based systems for representing sound.

[52] The free multi platform audio editing program Audacity was used to create these images. It is available at http://audacity.sourceforge.net/

Concluding comments

The Kansei system tries to grasp the intangible and discuss the ineffable, and to simultaneously celebrate these qualities; and notation systems try to document it[53]. While this opposition may seem as insurmountable as Lyotard's *differend*, they are both trying to provide ways of understanding and recreating the result of Robin Allots' impulse.

As "*Kansei* result is the fruit of *Kansei* process", it forms a looping system, similar to the Möbius-like system shown in Figure 7, on page 55. Kansei recognizes that the act of creative expression is a process of transmitting and receiving, a folding Möbius loop in which result and process are continuously leading to each other.

Notation systems provide an opportunity to make this loop material through recognizing the art-object as Denis does[54], as elements assembled in a certain order. By atomizing these elements, they allow systematic reordering and re-conceptualizing of the object itself, and for these actions to feed back into the system and its consequent object.

Computational systems are (currently) the ultimate form of atomising. By seeing all as data they also equalize everything. Thus allow a complete interdisciplinarity and multi-dimensionality to inform our broader experience; to inhabit the landscape encompassed by Derrida's *consensual horizon*; the possibility that Laurie Anderson's intangible *x* might equal *x*, or perhaps *n*; and a system through which that idea may might be realised.

The following four chapters outline the approaches used here to present the ideas and concepts flagged in the previous three chapters as art–objects.

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[53] I use the qualifier 'try' here as it is impossible for either of these systems to accurately emulate what they are trying to describe.

[54] See page 1.

Chapter 6: Creating the Objects

The foundation for the concepts investigated here is the belief that an art-object is a pointer to a process, that the gestures that form the pointer can be mapped across art forms, that an art-object exists only when it is being perceived, and that an artist expresses their world view through their art work are fundamental to the processes developed here.

The previous discussions form the conceptual basis this project. This chapter discusses how these considerations are developed into specific systems. The ideas formulated through the above understandings, have led to the concepts articulated through the three art-objects MOTION, SPEECH and VISION.

This chapter discusses the larger considerations in developing those art-objects, the concepts that inform them, the principles and processes used in expressing those concepts, the interface design, the presentation process, and the anticipated outcomes. The following three chapters discuss these aspects in more detail.

Concepts

In developing an art-object and the consequent experience triggered in the perceiver, a sequence of steps is followed:

- The creator presents a set of controlled events articulated as gesture in order to be perceived by another using tools - such as a brush, where, for example, the gestures are static, two dimensional[55], and visual; their body, in the case of a dancer, where they are fluid and four dimensional[56]; or a piano, when they are fluid and with no physical dimensions – within a set of methodologies, constraints, and paradigms both the creator and the perceiver subscribe to.

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[55] Here the dimensions referred to are the Cartesian dimensions *x* and *y*, in which events or objects can be mapped in a two -dimensional *x, y* graph.

[56] Here the four dimensions are Cartesian *x, y, z,* in which events can be mapped in a three-dimensional graph, and the non-Cartesian dimension *t (time).*

These gestures are then presented as an art-object within a chosen medium, which has a set of agreed paradigms within and encasing it, of which the creator is usually aware at the time of making - these may include, for example, an immediate and ephemeral presentation, as in the case of dance or drama; a stored past presentation, as in the case of film and recorded music, or set of agreed meanings, as in the case of a read text.

In turn, these gestures exist within a larger set of paradigms, over which the creator has little to no control or influence, such as a change in the creator or perceiver's personal, socio-political, and/or technological environments.

The perceiver then interprets the gestures that they see as emanating from the art-object according to their own personal, current, and immediate, set of paradigms.

The art-object itself is but one possible version of the creator's set of concepts; it is not the final or definite expression of the concepts he or she is attempting to transmit through those gestures.

Considerations

When perceiving any art-object there is an initial immediate interaction that then causes a subsequent residual, history-based, interaction. The discussions on the art-objects in Chapter 3: Literature/Influences are a result of these two complementary interactions.

Familiarity with an art-object is a result of these two interactions folding on each other. We are inspired to re-experience it due to our initial immediate, interaction with it. We return to it in order to re-interpret it through knowledge gained via previous, historic, experiences of it, and the web-like links between the art-object and other experiences.

Creator perceiver relationships

Figure 15 and Figure 16 below show different versions of the relationships between the creator, what they create, and the perceiver of that creation. Figure 15 shows the simple tripartite relationship between the creator, the art-object, and the perceiver. Here the only contact between the creator and perceiver is mediated by the art-object itself, which the perceiver then has an exclusive, ongoing, and dynamic relationship with.

In the following three figures the circular objects refer to processes or states of process that are fluid. In Figure 15, for example, the creator/interpreter engages in those processes required in the development of the art-object, the object itself is continually in the process of being recreated and interpreted as a result of reinterpretation in presentation, and the perceiver is also in the processes of reinterpreting and recreating the object, each time they consider it.

Figure 15: Tripartite relationship between creator, art-object, and perceiver.
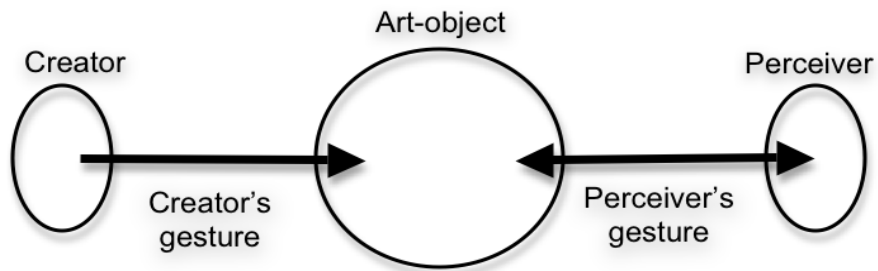
Figure 16 shows the creator, art-object, and perceiver within their own sets of paradigms, which meet and potentially intersect within the paradigms of the art-object itself and the medium being used.

Figure 16: The creator, art-object, and perceiver relationship within contextualizing paradigms.
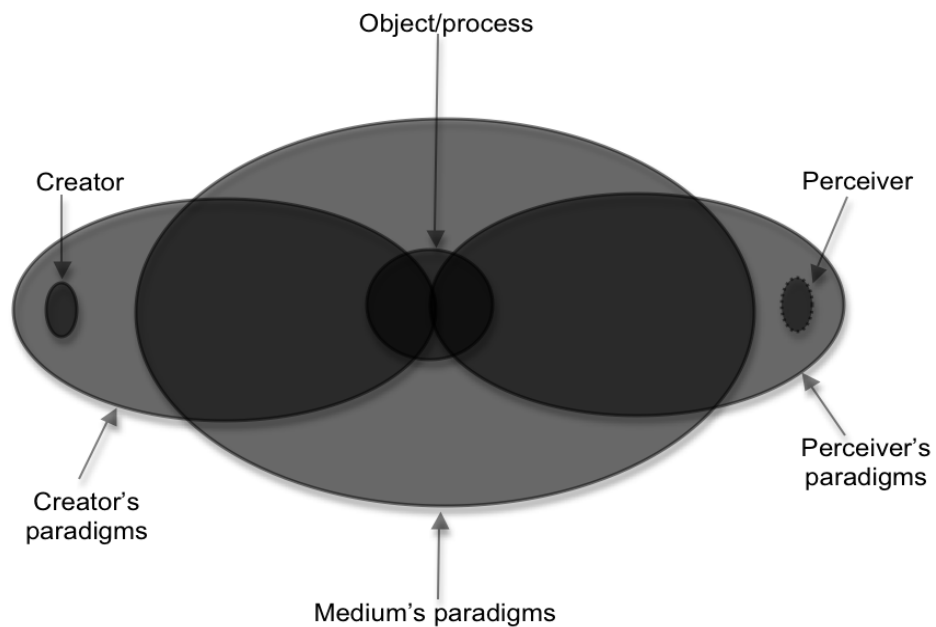
Figure 17, on page 79, shows the steps between creator's concept and the actual perception of the art-object residing in the perceiver. Here there is no direct connection between the creator and the perceiver, however the artistic result is central to the relationship.

Here the square objects refer to contained processes, which are distinct, complete, and sequential in expression. The central elliptical object refers processes that result form that sequence of processes, and these are in constant, dynamic change and development. It is this constantly changing outcome that in fact forms the artwork form the object.

These three versions of the relationship between creator, art-object and perceiver are clearly based on Jakobson's tripartite Addressor - Message – Addressee diagram, as shown on page 54, in Doty's diagram, and on other similar versions of this tripartite relationship.

These relationships exist within the universal and fluid socio-political, cultural, and technological environment. The relationship processes shown in these figures are encased within the paradigms of those environments at the time of making and perceiving.

Figure 18: Complementary and encompassing relationships between the art-object and the creator/perceiver, on page 79, shows these three interpretations of the Addressor - Message – Addressee relationship are working together to create a complete experience of the art-object and the process of perceiving it, interacting with each other in the process. The creator and perceiver are continually in a Möbius-like whirlpool of influences that are simultaneously subverting and supporting the art process as alluded to in Figure 7, on page 55.

Figure 17: Flow of concept from creator to perceiver to resulting art-object

Figure 18: Complementary and encompassing relationships between the art-object and the creator/perceiver

The active relationship between creator, art-object, and perceiver

Seth Kim-Cohen (2009, p. 46) reports Robert Morris's request that "it is important that the viewer be "more aware than before that he himself is establishing relationships as he apprehends the object from varying positions and under v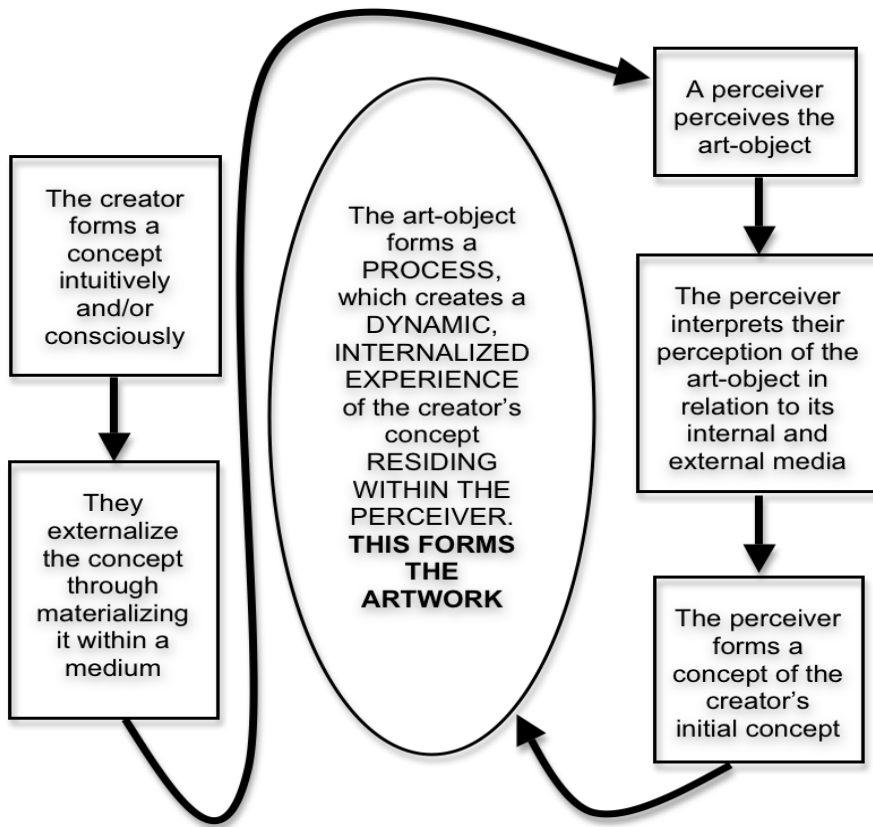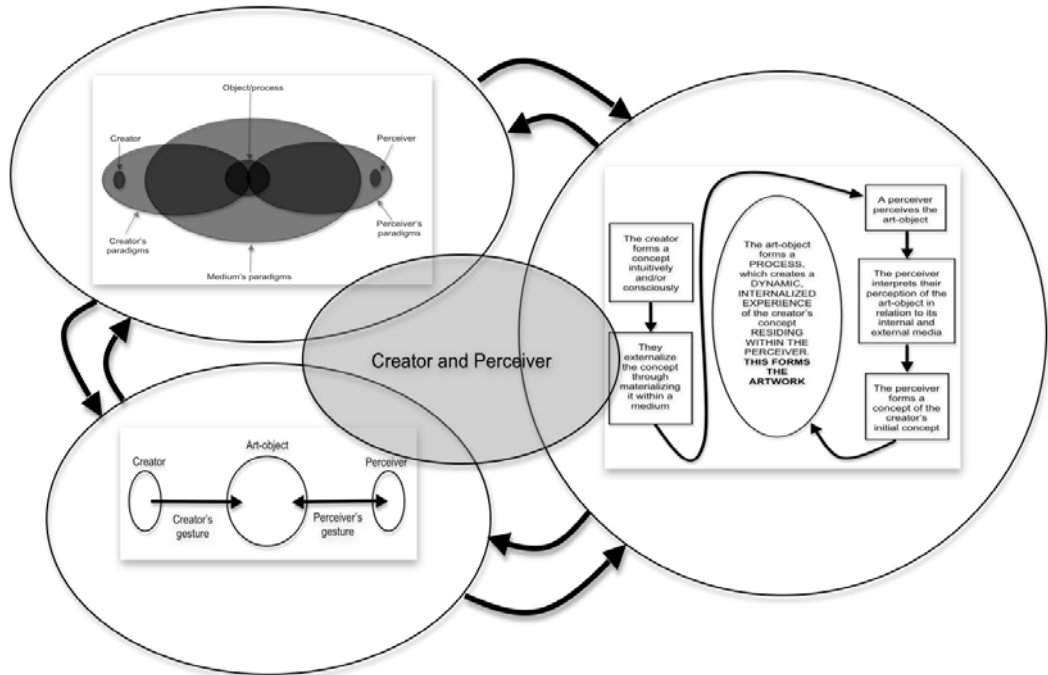arying conditions."" This requires that the viewer be actively aware of all of the aspects influencing their perception of a work, not just their location relative to the object, and in this request Morris makes it incumbent on the perceiver to simultaneously be aware of each of the situations graphed in Figure 7, on page 55, and Figure 15 to Figure 18, above.

Morris's request may cause a recursive, Möbius-like second-guessing of their relationship to the art-object in both the creator and the perceiver, potentially subverting their apprehension of it.

For the maker, once the object is made it cannot be unmade, and their role becomes similar to that of perceiver. By continually being aware of their ever-changing relationship to the art-object, the perceiver engages with it as a process, developing an understanding of themselves as mutually effective and affective agents in the creation of the art-object and their internal experience of it.

It is the dynamic internalized experience resonating within the perceiver that is the final location of an art-object, regardless of the form the gestures that coalesce to make it have taken. This experience is dynamic and ongoing, as the perceiver continually re-investigates both the resultant work and their experience and interpretations of it, consciously and unconsciously.

Interpreting these concepts in MOTION, SPEECH and VISION

The four fundamental concepts listed at the start of this chapter are interpreted via two interfaces: the camera based interface, which interprets the perceiver in the act of perceiving, and the Interpretation interface, through which the perceiver can influence the result of the camera's interpretation. The perceiver can use this interface as a way of adjusting what they perceive according to the paradigms that they bring to the viewing of the process. In this way they apply their own gestures to the work through the act of actively perceiving it.

Each system has its own way of mapping the gestures of the perceiver[57], which the perceiver cannot adjust. In MOTION their physical gestures are mapped while they are viewing the result. In SPEECH a string of phonemic gestures contained in the poem *Ambit* (Skovron 1992, p. 59)[58], are mapped as is sound and placement of the perceiver's mediated image on screen, this process also meditates the image. In VISION the saccadic-like gesture of a randomly moving focus point on the perceiver's image is mediated and mapped.

In each of these systems all elements are linked, forming the ephemeral audio-visual gestures that make the art-object. As the perceiver interacts with these systems through perceiving them they may develop a sense of the impact of their actions on the resulting art-object.

Principles applied in designing the systems

When developing the MOTION, SPEECH and VISION systems guiding principles were adapted to ensure consistency between the mapping systems and their interfaces. These are:

- Commitment – that the perceiver make a conscious, ongoing decision to interact directly with the work;
- Interaction – that interaction with the process by the perceiver be the focus in the creation of the immediate results of the process, in order that gestures made by the perceiver while perceiving/interacting with the process be integral to the perceived result;
- Uniqueness – that the result of the interaction be unique to the moment in which it occurs and the perceiver in the act of perceiving;
- Transferral – that the mapping processes of the three gesture types considered be a direct transferral of the specific gesture being considered;

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[57] These are discussed in greater detain in Chapters 7, 8 and 9.

[58] This poem was chosen for its intricate rhyme scheme. While its semantic qualities may be interpreted to reflect some aspects of the creative process, this was not a reason that the poem was chosen.

- Integration – that there be a direct link between the resultant sonic and visual events created by the processes;
- Relationship – that the tripartite relationship between author/art-object/perceiver be unique to the perceiver in the immediate act of perceiving;
- Intimacy – that the perceiver be able to acquire a personal, exclusive relationship with the art-object;
- Interpretation - that all resultant sonic and visual events be based on the perceiver's interpretation and reinterpretation of the set processes according to their paradigms as expressed through their interactions;
- Immediacy – that all events be perceived as being immediate;
- Ephemerality – that the results of the processes be ephemeral, ceasing to exist when not being interacted with.[59].

Each of these principles contains a near infinite variety of possible interpretations and potentials for fulfilment, and they may be considered as existing in any process of perceiving as art-object. However, here there is a direct application of these principles in the three systems.

In MOTION, SPEECH, and VISION the camera interface is an analogue of Ono's *A Box of Smile*, discussed on page 37. Here the perceiver is an integral and essential part of a work in which many of these principles are present, and the work could not exist without the committed, immediate interaction of the perceiver, just as the output of these three processes can not exist without the perceiver actually perceiving them.

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[59] It is possible for the perceiver to store the interaction processes at any time when perceiving the results of their interactions imply by stopping the process, however these stored processes will result in different outcomes when next used due to the perceiver being different when re-instantiating the stored processes.

The concurrent interpretation interfaces provide the complement to Ono's simple process. These are shown in Figure 22, on page 98, through to Figure 30, on page 125[60]. Here the perceiver has the opportunity to create their own interpretation through adjusting parameters that affect the way in which the art-objects interpret them. They do this through an experimental, self-directed, and exploratory approach. As a result, the perceiver develops an idiosyncratic, personal, and invested relationship with the system, and a consequent knowledge base that informs subsequent interactions with this process and similar systems.

As is seen when interacting with MOTION, SPEECH and VISION it is clear that the interfaces are complex, and the effect of any adjustment may well be unknown until the adjustment is made and the result viewed. This makes it difficult for the perceiver to predict the result of their actions [61]

This approach provides an analogy to the process of the individual perceiver adjusting their perception of an art-object to fit their paradigms. This adjustment occurs in any situation where the perceiver invests their attention in an art-object; it is the reciprocal gesture between the object and its perceiver. The Interpretation interface provides a system through which the perceiver may make their adjustments through their mental and physical gestures, to the point at which they are satisfied with their reciprocal interaction with the processes.

The Interpretation interface requires the perceiver to shift their attention from experiencing the art-object to developing a skill base that allows discovering more about the art-object. The commentaries of the theoreticians, academics, writers, artists and philosophers regarding the art-objects and ideas considered in Chapters 2, 3 and 4, and of course my own commentaries on those art-objects and ideas, demonstrate a process of shifting attention from the object being perceived, and placing it onto the act of interpreting the object through the lens of their, and my, current paradigms.

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[60] Examples of resulting visual images accompany these interface images.

[61] This is not unusual in a great deal of interactive software programs that effect data stored within a computer. This is discussed with examples in Chapter 6 Appendix: Examples of software interfaces, page 234.

In any act of interpretation a knowledge base is created, accommodating the idiosyncratic paradigms of the interpreter, their environment, and the object being interpreted. By applying these interpretations of the works considered in those chapters we have expressed our idiosyncrasies through our commentaries and interpretations, and, through that process, have recreated the art-objects as reflections of our paradigms.

Susan Sontag's description of Elia Kazan interpreting Tennessee Williams's characters, Seth Kim-Cohen's interpretation Stephen Vitiello's *World Trade Center Recordings* (2009, p. 128 -131), describing how the destruction of the New York World Trade Centre on September 11, 2001 drastically reinterpreted and recreated the work, and Vitiello's discussion of that work both before and after that event (feelmyglock 2010), are examples of the perceiver adjusting the art-object in order to fit it to the immediate and current paradigms that they bring to the art-object; however the art-objects themselves remain unchanged.

Implementation

The capacity to dynamically readjust the art-object is implemented in the camera and the Interpretation interfaces. First, the camera interface creates a situation where the perceiver's immediate presence is directly represented in the outcome; here their physical gestures influence the art-object.

Second, the Interpretation interface allows the perceiver to directly influence the outcomes of their gestures as represented through the processes, requiring the perceiver to remove their attention from experiencing the art-object in order to interpret and recreate it by applying their own immediate paradigms to it; just as Kazan, Kim-Cohen, and Vitiello removed their attention from the art-objects in order to reinterpret and thus re-experience them according to the changed contexts. When they did this, the repercussions were unpredictable; Kazan, for example, may not have predicted that his reinterpretation of Williams's characters would be reinterpreted by Sontag to discredit the act of reinterpretation.

The Interpretation interface has many parameters. MOTION, for example, has many controls that adjust the process after it has been activated. Access to adjusting the large range of parameters is immediately apparent but the effect of adjusting those parameters is not. The layout is such that it requires the perceiver to make changes without a clear knowledge of the possible outcomes of their actions, due to the variety possible separate interactions; and the internal possibilities within each of those parameters create an almost infinite range of possible outcomes[62]. Therefore, adjusting any of the parameters available in the Interpretation interface can have unexpected repercussions.

The descriptions of each of those parameters are also deliberately opaque. The reason for this is to provide an analogy to the interactive process of interpretation. When a perceiver interprets an art-object they shift their attention from experiencing it to their immediate paradigms and the contexts in which that interaction is occurring. They then apply those to the art-object, thereby immediately re-creating it from within those paradigms and contexts.

When the perceiver adjusts parameters in the Interpretation interface they shift their attention from the visual and aural events presented on screen. This action is then reflected in the actual art-object, as the perceiver's removal of their attention from the screen to the keyboard and mouse is immediately represented in the art-object itself via the camera interface.

System/interface design

As outlined in the introduction, the goal here is to map gestures across art forms; to that end the image of the perceiver in the act of perceiving is altered according to the different systems and operations available within each of the three mapping processes: MOTION, SPEECH, and VISION.

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[62] The x offset parameters in SPEECH, for example, have 960 points of difference, each of which has an impact on the outcomes of each of the other parameters in the IMAGE ADJUSTER section of that process.

The purpose is not to create a direct interaction between perceiver and art-object as Ono did in *A Box of Smile*, but to mediate that interaction through the three gestures being considered; the motion gesture, as articulated through the mapped movements of the perceiver to an audio-visual outcome; the sonic gesture, as articulated through the mapping of speech sounds to frequencies and the placement of the image on screen; and the saccadic gesture, as articulated through the quasi-random focus of the camera input.

These mapping processes have distinct similarities:

- Perceiver mediated input result in aural and visual (screen-based) events;
- Interactions between these aural and visual gestures are directly integrated;
- Processes for taking in and mediating these events share similarities;
- User interfaces be similar (however these are adjusted to fit the specific needs of the gesture being mapped).

The processes differ as follows:

- In MOTION, the movements of the perceiver concurrently trigger both visual and sonic events;
- In SPEECH, the phoneme string of the poem orders a sequence of randomly chosen events, which in turn are interpreted to determine the frequencies heard and the position and dimensions of the mediated image of the perceiver presented on screen;
- In VISION, the saccadic-like scanning of the image of the perceiver creates a moving image, the Colours of which create the sounds heard.

The perceiver mediates each of these unique characteristics through their physical gestures while viewing the processes, and also through their interactions with the various parameters available in the Interpretation interface.

In developing the interfaces for MOTION, SPEECH and VISION, the intention is to create a situation in which the immediate interaction and the residual interaction fold in on each other, forming the Möbius like relationship between the maker, object and perceiver shown connecting the sender and receiver through the object in Figure 7, on page 55. This causes a familiarity with these processes that is both immediate and residual. For example, when returning to the processes, the audio-visual result will be different from any previous result because the perceiver will be different from the last time they perceived it.

Interfaces

There are two interfaces for each process, the camera interface which takes in the perceiver's image prior to its mediated presentation on screen, and the Interpretation interface, in which the perceiver can interpret the presentation of their image, within the parameters of the gesture mapping system and via the controls available in the present Interpretation interface.

In the most complex Interpretation interface, SPEECH, there are over one hundred possible controls available to the perceiver to influence the results seen and heard at any one time[63], many of which have similar functions to those of MOTION and VISION.

The effects of these controls are interdependent, resulting in a vast variety of possible results and interactions, and this may cause results that are unintended, such as invisible images or silent sounds being presented.

Interface fundamentals

The fundamental goals for the interface design here are that:

- The results of the process are dependent on the perceiver's interaction with the process;
- The perceiver's interpretation of the process influence the outcome of the process;

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[63] While this may seem many at first glance, there are usually far more control options available in most computer-based processes used to mediate sound and vision. However these are often concealed in layers, in different windows, or accessed through menus.

- The results are essentially ephemeral (although that snapshots of the interaction, as set by the perceiver, can be stored and reinstated);
- Interaction with the process be simple (through requiring a conscious understanding developed through personal experimentation);
- Each process should have a similar interface for the perceiver;
- The results of the interaction with the processes be novel for the perceiver at each time of access;
- That the perceiver be able to change parameters dynamically, allowing the interpretation of their interaction and the results of those interpretations.

It is essential to the ideas that underpin this project the outcomes created be dependent on the interaction with the work. Therefore the interfaces reflect that results of an artistic process are essentially a dynamic, flowing and reciprocal dialogue between the art-object and the perceiver. To this end the perceiver is required to have an active, ongoing agency in the process of perceiving the art-object, due to the unique nature of the instant interaction between the perceiver and process.

Presentation

In most situations the presentation process and conventions of any art-object are highly prescribed and well known to both creator and perceiver. Within this project is the creation of a set of processes that require perceiver interaction; the presentation of these can take a variety of forms, each of which fit the common processes of presenting an art-object for perception. These are:

- The perceiver be invited to engage with the art-objects by the creator or their agent (this follows practices of performance art presentation, in which the audience is invited to a location in order to engage with the object);
- The art-object be offered in a form that the perceiver can relocate and re-perceive at their leisure (this follows the practices of recorded arts);
- The object is presented in a gallery situation using only the camera interface for interaction.

The preferred presentation process is the first. These art-objects are seen primarily as existing in a gallery situation in which perceivers engage directly with the object.

Anticipated outcomes/conclusion

There are five main goals considered in influencing the art-object experienced by the perceiver:

- The gesture mapping system form the core of the art-object;
- The interpretations of the perceiver have clear influence on the result that they perceive;
- The processes are engaging due to immediately perceivable outcomes;
- The result is engaging due to the sense of 'perceiver ownership' of the result;
- The act of viewing creates a sense of stillness in the perceiver.

Mapping of gestures from one art form to another is the structural basis of the systems presented here. It is a goal that these mapping systems form a subtle internal frame around which the perceivable, externalized outcomes of the creation process become an object. These abstracted and transformed gestures provide traces of their original expression, filtered through the processes of interpretation and perception discussed earlier.

It is hoped that the audience will remain engaged and develop a sense of ownership of the specific result of the results of their interactions that continues to resonate within them, forming traces that influence further interactions with and interpretations of the work, other works and larger encasing paradigms. In this way the perceiver takes an active and ongoing role in the development of the work for themselves, forming an ongoing, looping, and reflective process.

Stillness

Finally, that there be a sense of stillness evoked in the perceiver is a personal goal of all art-objects that I create. The works discussed in Chapter 3: Literature/Influences, each evoked this sense in me as a perceiver through capturing my attention and attaching it to the work itself. The art-objects of Ryoji Ikeda, Luigi Nono, Lisa Yuskavage, and Yoko Ono achieved this response in me by creating their own paradigms and contexts, and requiring me to enter those by transcending the paradigms and contexts I bring to their perception. I am forced by the works to enter their worlds and leave my own, and in doing so these works cause a sense of stillness.

Conversely Cage's *Theatre Piece No 1, Imaginary Landscape No.4,* and *4'33"* are pointers to immediate and ephemeral paradigms and contexts, and these three works just as emphatically require me to enter their immediate and ephemeral paradigms and contexts through being ephemeral and immediate. They extract me from my paradigms and contexts then force me to re-enter and re-view my world through their reinterpretations of my paradigms and contexts, and with the addition of their perception tools.

Introducing the systems

In the following three chapters I discuss the processes for generating these outcomes in greater detail. These chapters present more focused discussions on the implementation of the ideas considered above, including more discussion on the technical approaches to developing the processes.

Chapter 7: MOTION: Mapping large motion to generate an audio-visual outcome discusses the background to developing the process; how it is differentiated from other, previous approaches to gesture mapping; the creative approaches taken in developing the process; and its mechanics. Chapter 8: SPEECH: Mapping speech gestures to generate an audio-visual outcome discusses the use of the motion of the vocal tract in speech, as defined through phonemic notation to create a computerized viewing of an image and the approaches to developing the process. Chapter 9: VISION: Mapping saccadic motion to generate a n audio-visual outcome discusses uses of the saccadic-like motion to create a computerized viewing of an image.

Chapter 7: MOTION: Mapping large motion to generate an audio-visual outcome

While *A Box of Smile* is the conceptual parent of these systems, MOTION also takes as a precedent the process of 'action painting', made famous by Jackson Pollock, as shown in Hans Namuth's film *Jackson Pollock* (1951). Here the direct relationship between Pollock's physical gestures and the simultaneous creation of an image is seen to great effect.[64]

Pollock's mastery allowed a unique expression to occur, one that caused a re-consideration of a painting from being a finished, representative, work to one that depicted the process as being a major part of the art-object, where, according to Harold Rosenberg (1961, GETTING INSIDE THE CANVAS section, para. 1), the canvas becomes "an arena in which to act … a space in which to … "express" an object, actual or imagined. What was to go on the canvas was not a picture but an event"; an event comprised of gestures placed on the canvas.

'Action painting' expanded to 'abstract expressionism', allowing other forms of art making to fit the genre. Dancer/choreographer Martha Graham's movement work was also considered a part of this genre. Her work was intensely introspective, expressing her immediate internal, personal experience.

Pollock's gestures are concrete and static, and Graham's are ephemeral and dynamic. However, when viewing Namuth's film it is possible to see that Pollock's gestures demonstrate similar control, focus and intention to that of a dancer. For Pollock the canvas is the "arena in which to act", as space is the arena in which a dancer acts. Pollock's canvas takes his dynamic, ephemeral gestures, translating them into Colours and shapes on the canvas. 'MOTION' expands on this process, creating a dynamic, temporal, and ephemeral audio-visual work, through mapping the gestures of the perceiver in the act of perceiving to create an audio-visual work.

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[64] This chapter is based on and quotes significantly from my paper ActionA/V: An Improvisatory Process for Translating Movement into and Audiovisual Outcome, presented at the 2010 Australasian Computer Music Conference, Canberra.

Differentiating MOTION from previous approaches to integrating movement gestures in interactive audio-visual outcomes.

A great deal of work has been done in the area of mapping physical gesture to sonic and visual events. The plethora of books, web pages, and journal articles dedicated to the topic attests to this. A brief list of some eminent practitioners in this area include Marcello Wanderlay, Hellen Sky, Garth Paine, Critical Path, Chunky Move, autraLYSIS, Troika Ranch, Nick Rothwell, Antonio Camurri, Sarah Rubidge, Ros Bandt, and Johannes Birringer. This list omits many very worthy practitioners, each of whom contributes unique approaches to the field. Areas of exploration range across music, haptics, neurology, meaning (and subsequent interpretation), and facilitation through virtual, and actual instrument/interface making and its representation.

The majority of these practitioners work in performance situations that integrate movement, music and vision through computer technology. Often the processes developed follow similar paradigms to the integration of those elements in performance without the use of computer technologies, and the casual audience might not be aware of the fully interactive processes being used, instead considering the outcome as similar to cue-based integration of these different elements.

In these cases the relationship between the various elements (lighting, sound and projections) are complementary at best. Often they provide a supporting role to the choreography and subsequently the dancer(s) on stage. This particular paradigm is based on the natural desire in the performance creator and their audience to place primacy on the human element of the performance. As humans we are inclined to give our attention to that element within any communication process, and performance is no different.

MOTION differentiates from this approach in that its purpose is not to create work that unifies or coheres disparate elements. Instead it considers the process used both by the action painters, in which their movement is translated to be viewed without and separate from the human element involved in its creation, and by dance, in which the outcome is ephemeral and located only in performance and the perception of that performance.

Computer interactions

It is important that perceivers sense a direct relationship and coherence and the sonic and visual gestures. To this end their physical gestures generate the sounds heard an images seen through the area-based system shown in Figure 20 and Figure 21, on page 96, and discussed in Camera interface, on page 95. The perceiver can then adjust those gestures through their interaction via input through the computer keyboard and/or mouse with the Interpretation interface, an example of which is shown in Figure 23: MOTION interface with interpretation controls on page 99; the flowchart shown in Figure 19, on page 93, shows these two interactions.

Figure 19: Flowchart of the MOTION process
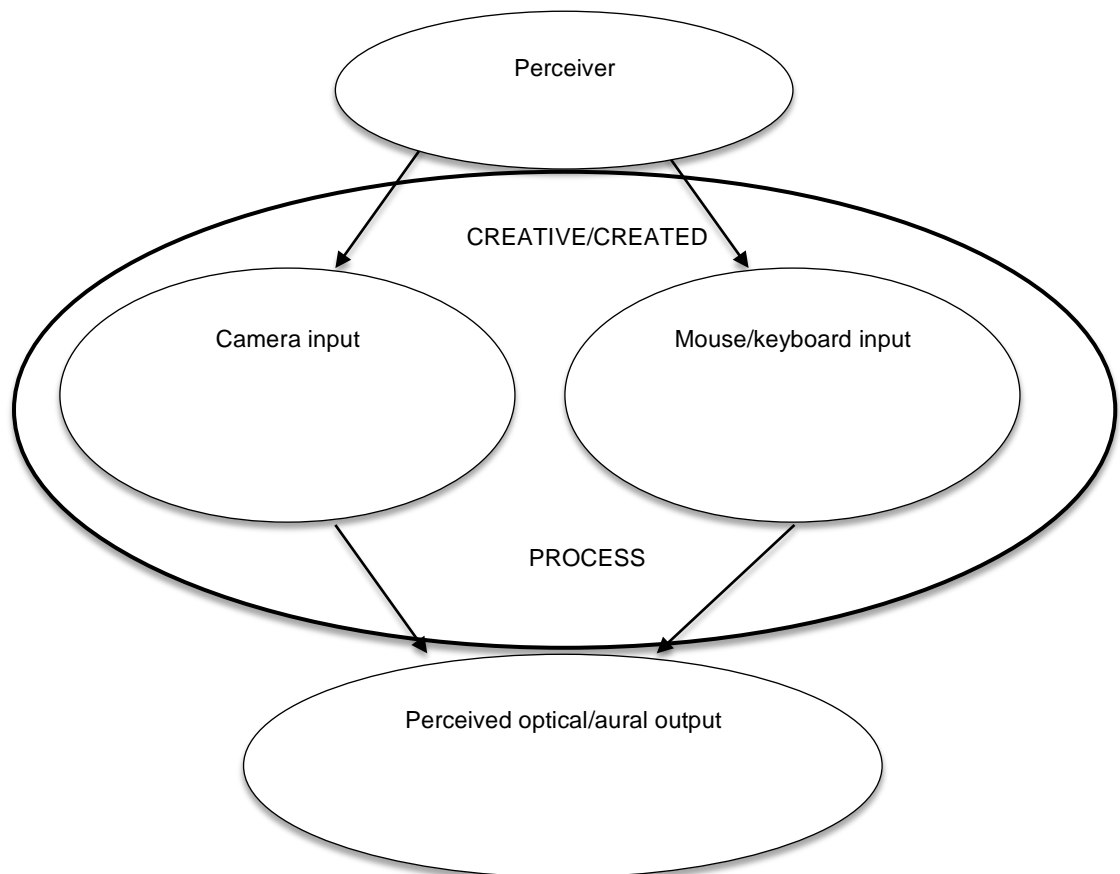
Area/gesture-based interaction

An area-based interaction paradigm creates an interface similar to that of a musical instrument. A piano, for example, has up to 88 excitation areas, its keys, and each causes a specific sound to occur when activated by a physical gesture; therefore the sonic outcomes are very predictable. The violin is far less predictable as there are an almost infinite variety of excitation areas on a violin, including finger position on the string and fingerboard, effecting frequency, and bow pressure and angle on the string, effecting timbre. Therefore more experience is required when using a violin to produce predictable outcomes than a piano.[65] In both cases a conscious control of the areas is first required in order to later develop an unconscious, intuitive control.

When designing MOTION, it was important that the perceiver develop an unconscious, intuitive, sense of the relationship between their movements and the sonic and visual results through experiencing the system reacting to their movements in a predictable way, as a piano reacts predictably. It is anticipated that they notice the effect of their movements, creating their initial relationship with the system and its result, and then consider and experiment with possible ways of influencing the outcome through adjusting the various parameters available to them via the Interpretation interface, discussed on page 97. Here the perceiver exercises a mental control of the system, interpreting and adjusting their interaction with it through the paradigms that they have brought to it.

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[65] This is a very simplistic view of the skill development in each of these instruments; it focuses only on the developing a sound that the musician/creator can predict accurately prior to developing expressive facility.

Camera interface

The camera interface addresses a twenty-area plane, as seen in Figure 20, on page 96. When deciding what influences to attach to each area the shape of a person in the centre of the camera's focus space was considered. Therefore movement in the central column, areas 3, 8 and 13, influences the original primitive shape[66], while the areas on both sides of that central column influence its colour and virtual lighting position, and the external columns influence the position of the virtual viewer. The bottom row influences the shape of the primitive and how transitions in that shape occur, this means that the primitive remains constant unless there is a deliberate desire by the mover to change it. The results of the movements when the viewer is close to the camera could include much change in the shape of the primitive, less in the Colours, and little in the position of the shape and its orientation to the viewer.

The camera interface makes it possible for perceivers to actively influence the result of this process. As movement is sensed in an area, the audio and visual effects related to it are activated, with more activity causing more change. If the perceiver is closer to the camera, movements are registered over more areas, and less movement is required to influence the image, this means that very subtle and fine movements effect change. As the perceiver moves further away from the tracking camera, as seen in Figure 21, the degree of movement in each area must increase to have influence, and the possibility of movements being registered over more than one area decreases. This means that the perceiver can exert more subtle control over the shapes and sound by their proximity to the camera.

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[66] A more detailed discussion of these elements is found in Image Decisions, on page 111.

In Figure 20 the face of the perceiver is quite close to the camera and therefore affect the central areas more than the outside areas; however, there may not be much activity in this area as the face may be quite still when perceiving the image, just as one's face is comparatively still when looking at a computer screen. In this situation, typical (usually unconscious) movements such as tilting the head, blinking or opening or closing the mouth, or shifting in the seat will have a more subtle effect than scratching the nose might, and the perceiver might not immediately recognize this interaction. As familiarity a desire to control the image may result, and a greater attention to their subtle movements will become apparent.

In Figure 21, on page 97, the perceiver is further away from the camera and therefore larger movements are required to have effect. This means that they have finer control of the specific aspects influenced by each of the areas. For example; moving the left hand will influence only the green value of the output image whereas with the image close to the camera, as in Figure 20, movement of the head will influence at least seven areas.

Figure 20: Perceiver close to the camera[67]

1. Rotation on the x axis	2. Light position 1	3. Perturbation 1	4. Light position 2	5. Rotation 2 on the y axis
6. Rotation 3 on the z axis	7. Red value	8. Perturbation 2	9. Green value	10. Camera Angle 1 on the x axis
11. Camera Angle 2 on the x axis	12. Blue value	13. Perturbation 3	14. Light position 3	15. Camera Angle 3 on the z axis
16. Dimension value, the number of x and y dimensions of the primitive shape	17. Image type (alternating between outline or solid)	18. Radius minor (the size of the hole in the centre of the torus)	19. Shape primitive	20. Trace amount, influencing the roughness of the image edges.

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[67] These figures show are not to scale; the areas are all equally sized.

Figure 21: Perceiver distant from the camera

1. Rotation on the x axis	2. Light position 1	3. Perturbation 1	4. Light position 2	5. Rotation 2 on the y axis
6. Rotation 3 on the z axis	7. Red value	8. Perturbation 2	9. Green value	10. Camera Angle 1 on the x axis
11. Camera Angle 2 on the x axis	12. Blue value	13. Perturbation 3	14. Light position 3	15. Camera Angle 3 on the z axis
16. Dimension value, the number of x and y dimensions of the primitive shape	17. Image type (alternating between outline or solid)	18. Radius minor (the size of the hole in the centre of the torus)	19. Shape primitive	20. Trace amount, influencing the roughness of the image edges.

Interpretation interface

Through using the Interpretation interface, shown in Figure 22 and Figure 23, the perceiver is able to interpret the effect of their gestures, as represented visually and sonically while interacting with the process. This aspect of the process allows the perceiver to experiment with their interpretations, to see the influence of those interpretations on the outcome, and to decide at which point the outcome fits their paradigms.

The intention in this interface design is that the perceiver discovers the effect and function of each parameter through experimentation. It

The 62 possible controls are divided into six sections, each with specific functions: to list them from left to right:

- CONTROLS   On/Off switches for the process
- SHAPE GENERATION   Nine controls used to create the primitive shape
- SHAPE DISTORTION   Three controls that influence the distortion of that shape, and the three controls that influence the speed of that distortion
- COLOUR ADJUSTMENT Controls the Colours seen on the shape
- IMAGE EFFECTS   Controls the Colour saturation, the position of groups of pixels on screen, and the dispersal of the image's pixels on screen

- AUDIO EFFECTS   Controls the pitch, amplitude and spatialization within the binaural space.

Below these six sections is a bank of presets that includes preset interface parameters chosen by me, and offers the possibility for perceivers to create parameter presets chosen through their discovery of and interpretation of the process, for their own later use.

The integration of these two interfaces creates a twofold interaction: the somatic, mapping physical aspects of the act of perception through the camera interface, and the mental, mapping the considered, interpretive aspects of perception through the Interpretation interface.

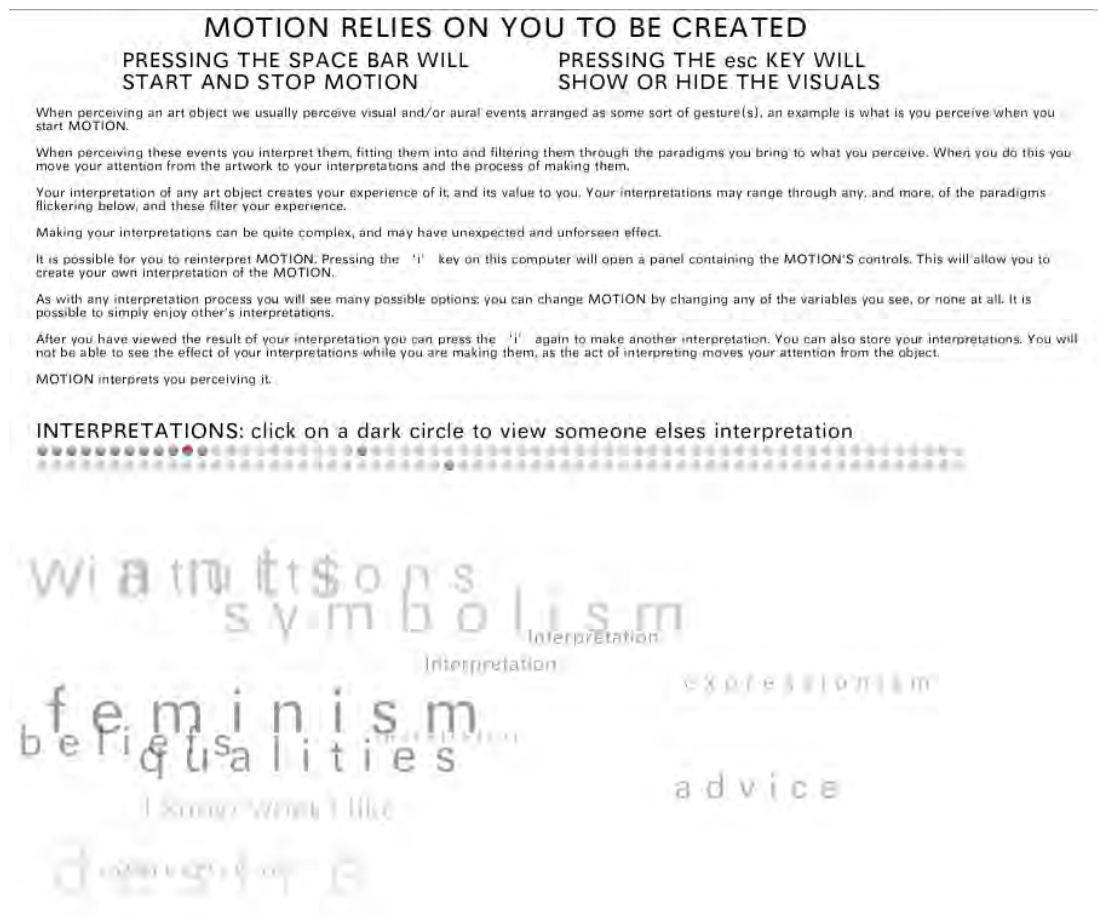Figure 22: MOTION interface without interpretation controls.

Figure 23: MOTION interface with interpretation controls

Figure 24: Screen image resulting form an interaction with MOTION

Creative decisions in developing the outcomes of MOTION

Sonic decisions

The sound for this version of MOTION was generated from two sources: a solo voice sourced from the Rex Box™© sound library titled *Religious Voice*, and a recording of the speech Ronald Reagan gave discussing the Challenger Space shuttle tragedy of January 26, 1986 (Reagan 1986). These were then convolved and pitch shifted to form a pentatonic scale using SoundHack (© Tom Erbe, 2007). This results in sounds that reference the human voice in both song and speech, highlighting the consonantal noise and vowel sonorities, but without the denotative qualities of song or speech.

Each of the five sounds of the pentatonic scale is triggered simultaneously (or after delays set by the perceiver) and then fed through a gate allowing each sound to be heard in either the left or right side of the headphones used for listening. This allows the perceiver to create a melodic result by triggering specific iterations of the sounds through their movements in the camera's focus space.

Choice of the sounds used

In my role as the creator of the process, I chose the human voice as the source of all sounds used here. It is the sound source that evokes a sense of connection, and through which the vast majority of our aural communication occurs. It is also a sound source that has resonances in our individual and collective sub-conscious memories.

These two uses of the human voice contain socio-political inferences, and there are strong opinions associated with them. In *Religious Voice* there is a clear reference to the Western Christian traditions, and the political resonances of Ronald Reagan can draw many diverse and conflicting opinions. The decisions to use these sounds considered the implications inherent in these choices; but what was more important was that the sonic characteristics of the sounds used have a potentially predictable resonance for the listener.

Ronald Reagan was renowned as a "great communicator", having voice qualities that engaged and enrolled the listener in his discussion. His mastery of Kaelin's (1988, p. 110) rhetorical devices, in particular affective "intonation, modulation of the voice, tempo, and characteristic manner of expression" was exemplary in this speech, as his innate abilities came to the fore in a heartfelt and personal speech that clearly connects with his audience.

The *Religious Voice* sound has similar, though more constructed, qualities, evoking a sense of stillness through a gesture oriented, rather than pulse oriented, traversal of time.

Through convolving these two audio tracks the melismatic and constant qualities of the *Religious Voice* blur the comparatively clipped and segmented qualities of Reagan's speech, but resonate its pitch alterations and sonorous qualities, potentially creating a complementary sonic experience to the visual aspects of the process.

Effecting the sounds

Under the heading AUDIO EFFECTS, seen in **Error! Reference source not found.**, on page **Error! Bookmark not defined.**, the parameters through which the perceiver can influence the sonic results are shown. These relate to: the speed at which the sounds pan and fade in or out, the amplitude of each of the five individual iterations, their master amplitude, the playback speed of each of the five iterations and the master speed. These sounds are then positioned in a binaural space, in which the direction and distance from the listener can be specified.

Image Decisions

The images generated on screen show little resemblance to the perceiver actions other than as an abstract response to their gestures. This is to ensure that the perceivers are not influenced by self-consciousness or distracted by any considerations of their own movement until they decide to take an active agency in the immediate process.

It is anticipated that this will result in more subtle, unconscious, movements by the perceiver when first engaging with *MOTION*, much like those of one examining a newly discovered object. Then, as familiarity with the effect of their movements increases, a more intentional focus on generating and influencing the onscreen image through their gestures may develop. However, it is important that the visual and sonic result of their actions be considered as separate from themselves, much as the action painters considered their work on canvas as separate from, or an extension of, their physical actions, and that the image seen in *Box of Smile*, while being of the perceiver, is conceptually separate from the perceiver.

Choice of the images used

The process of creating the images was based on altering eight possible primitive shapes available through the Jitter iteration of the OpenGL[68] system: sphere, torus, cylinder, opencylinder, cube, opencube, plane, and circle, which can be generated as wire frames or as solids, as shown in Figure 98 to Figure 102, on page 233. Each of these shapes can be drawn in one of eleven ways, as either: points, lines, line_strip, line_loop, triangles, tri_strip, tri_fan, quads, quad_strip, polygon, or tri_grid; examples are shown in Figure 103 to Figure 113, from page 235,

The perceiver's actions as they move in the various areas affect the shape of the image, as outlined under the heading Area/gesture-based interaction, on page 94, with movement in area 19 potentially changing the primitive shape, as shown in Figure 20 and Figure 21.

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[68] Open GL stands for Open Graphic Library, originally created by Silicon Graphics ™.

Figure 98 through to Figure 101 shows the OpenGL primitive shape 'torus', created with four or sixty dimensions[69], virtually viewed from different angles and with similar virtual light source positions. In Figure 98 the four-dimensional torus is viewed from an edge, creating what appears to be an image of a two-dimensional square, however it is possible to see the rear of the torus to the right of that square. Figure 102 shows a 60 dimensional torus drawn as a grid viewed from a similar virtual viewer position and lighting angle to the previous examples; Figure 102 shows the primitive drawn from a virtual viewing position oriented to the front of the shape.

As the virtual viewer moves around the virtual object the image on screen changes. The effect of this process is an image that appears to have the qualities of a three-dimensional object. The virtual viewer has a position in relation to it, as does the virtual light source illuminating the object. In Figure 98, for example, the light source is positioned to the lower left of the object. In this figure the virtual viewer is positioned to the side of the torus, and in Figure 99, the viewer is positioned more to the front of the torus.

Influence of the perceiver's physical gestures on the shape

Figure 20 and Figure 21 show that the majority of influence the perceiver's movement gestures have on the image seen as in the orientation of the virtual viewer to the image. For example; movement in areas 1, 2, 4, 5, 6, 10, 11, 14, and 15 all affect the virtual viewer's orientation to the virtual image and the orientation of the virtual light source to that image, which causes the shape to seem to have quite different qualities.

Movement in the central areas, 3, 8, and 13, will distort the primitive's shape, often out of recognition. If the shape is a torus movement in area 18 affects the size of the hole in its centre, as seen in Figure 102. The perceiver can adjust the depth of effect that their gestures have on selected aspects of the shape in the SHAPE GENERATION, and SHAPE DISTORTION sections of the Interpretation interface.

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[69] Here 'dimension' refers to the number of points on the *x* and *y* axes, as seen in Figure 98.

Effecting the image

After a shape is generated and its attributes (such as number of dimensions, amount that the image is perturbed, virtual viewer and lighting positions, and position of the image on screen are set) the image can then be further adjusted by the perceiver changing the parameters under IMAGE EFFECTS.

This section allows the perceiver to further adjust the screen response to their movements according to their interpretation of the process; this is done in the COLOUR ADJUSTMENT and IMAGE EFFECTS sections. For example: there may be a preference for brighter or inverted Colours, the image to be spread over a larger number of pixels, and slower or quicker movement of the image in response to their actions. Through adjusting these elements the perceiver is again given opportunity to adjust the image to their paradigms in the act of perceiving it. Figure 24: Screen image resulting form an interaction with MOTION, on page 99 shows an example of a resulting image as represented on screen.

Concluding comments

As a system for mapping gestures across art forms, MOTION allows direct interaction between modes of expression. Here the somatic/kinetic gesture is seen to be creating a response in an audio-visual medium, which has a direct relationship to that movement but is not in itself somatic or kinetic. It also allows for the perceiver to exercise a mental gesture in the creation of the work, through their interaction with the outcome of the process through the Interpretation interface.

The initial concept of MOTION – creating a system where an artwork is developed through the gestures of one mode being expressed through another – grew to create a work in which the gestures of the perceiver in the act of perceiving the art-object create the art-object.

For the perceiver it is not necessary to have a detailed, comprehensive understanding of the systems used to generate and effect the images; it is their interaction with the surface of MOTION, the images that they see and sounds that they hear, mapped through their movements and interaction with the Interpretation interface, that makes the actual image seen on screen. It is the intention that this interaction be done intuitively and experimentally, ensuring that the result is a representation of the paradigms that they intuitively bring to the perception and subsequent interpretation of an art-object/process.

This mapping system allows for many other approaches to be used in developing future works; any kind of motion or visual input can be used to generate sonic and visual outcomes.

The following two chapters discuss the development and implementation of the processes SPEECH and VISION. Many of the design intentions and approaches used in MOTION are reproduced or very similar to the approaches used in developing SPEECH and VISION; and those aspects will not be discussed in the same depth as in this chapter.

Chapter 8: SPEECH: Mapping speech gestures to generate an audio-visual outcome

The act of speaking contains a number of gestures, which include: the physical gestures of moving the mouth, considered and notated as phonemic gestures; the mechanical gesture of propelling air; the mental gestures transmitted through speech; the temporal and frequency gestures of speech intonation, and so on. The goal of SPEECH is to develop a system that presents the phonemic gestures contained in the poem *Ambit*, interpreted as sound and placement of image on screen[70]. This image reflects the physical, ephemeral gestures of the perceiver in the act of perceiving, mediated by those structures and a set of musical paradigms.

To this end a system for translating phoneme symbols into data (that can be manipulated through various arithmetic processes to create melodies and consequent harmonic structures) is used to affect the visual elements and generate the sound.

In MOTION the purpose was to create a system in which the gestures of the perceiver perceiving are the initial generator of the system; it is one version of the Möbius like link between the maker and the perceiver. In that system the perceiver imposes themselves on the process through the filters created by the maker, in order that the perceiver impose themselves on the process through interpreting it.

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[70] This is discussed earlier in Interpreting these concepts in MOTION, SPEECH and VISION and System/interface design, page 83.

In SPEECH, the perceiver's image and physical gestures are filtered through the speech gesture of the poem. This gesture is imposed on the articulation and perception of the process, it is external to the perceiver, and they have no awareness, other than that it is having an effect. It is also important that the perceiver not know of the semantic content of the poem, as it is not relevant to the process as presented and perceived and cold have an unwanted influence during the perceiver's interaction with the system.

Differentiating SPEECH from previous approaches to integrating speech gestures in interactive sonic-visual outcomes

This kind of mapping from speech to a sonic and visual outcome is not as prevalent as the mapping of motion to sonic and visual outcomes, particularly in the art world. Systems for translating speech into text and computer control are prevalent, examples of this include commercially available software such as 'Dragon Naturally Speaking' (© Nuance (Nuance 2011)) and 'Voice and Speech Recognition Software' (© e-Speaking (e-Speaking 2011)), and voice activated instruction and selection systems such as that offered by Salmat (© vecommerce, (vecommerece 2011)). Systems that facilitate interactions with technologies are also prevalent in medical, the military, and disability industries, and these are usually based on binary instructions that cause a single reaction from the technology.

In the interactive arts using spoken word as a method of triggering events is more unusual than using motion, particularly in the area of gesture mapping. This is mostly due to the problems that arise when using sound as the trigger; not least being the difficulty of ensuring only the desired sounds cause events, as environmental and unintended sounds are usually continuous and difficult to filter out in most circumstances.

However, there are a vast number of gallery/installation and performance practitioners who integrate text, spoken or written, into their presentation. Examples of this include: the artist's/curator's/critics statement, the composer's explanatory discussion, the use of text in the art-object[71], and the projection of text in dance and theatre presentations.

Some practitioners do use the spoken word as trigger. Ann Morrison's *Talk2Me*, (2010, p. xii), where

> Participants speak through microphones, hear through headphones suspended in the space, and view their 'conversations' (often random and nonsensical) projected onto the walls of the [geodesic] dome

is an example of integrating the spoken and written word in the one work, and *Waco Resurrection,* by Eddo Stern (2004), a computer game/installation/mixed media work uses the perceivers voice commands to influence the actions taking place.

Alivin Lucier's *I am sitting in a room* (Lucier 1969), and Steve Reich's *Come Out* (Reich 1987), are examples of recording devices used to create a sound art/musical outcome from voice, and Paul Lansky's *Now and Then* (1992) is an early example of using computer systems to effect speech in such a way. In each of these examples, it is the actual sound of the voice and the sonic structure as created by the intonation of the speaking that forms the structure of the art-object. The same systems could have been used with another sound source, and the result, while having surface similarities, would be built from different structures.

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[71] Le Trahison des Images is an example of text being fundamental to the ostensibly visual artwork; and the number of visual artists who have followed this path and use the written word as a fundamental element in their work is huge.

In more traditional musical settings there are many situations in which the semantic structure of a text influences the composition: *Fragmente - Stille, An Diotima* is one of many similar examples. The Frog Peak Collaborations Project, in which composers worked with a text reading by Chris Mann, shows of a more direct mapping between a text and a sonic output. Carter Scholtz's *An Economy of Virtual Unknowns* (1996) is an example of a pitch to MIDI process being used to create a sonic event based on the intonational structure of Mann's reading, and not necessarily making a direct semantic reference to the text[72].

SPEECH differentiates from these processes as it uses the abstract sonic core of the text, as represented by the phoneme string, to form the structural background[73] to create the work. It also does not consider the composer's taste, aesthetics, or perception/interpretation of the text when creating the outcome. Its' purpose is to create an ephemeral outcome that interprets the perceiver in the act of perceiving through the filter of this structure.

Computer interactions

The arithmetic processes mentioned earlier allow an almost infinite variety of interpreted sequences that are a direct consequence of the original phoneme sequence. In the system titled SPEECH this area is called FORM as it is where the perceiver sets how the textual gesture forms the background core of the system.

After this core has been interpreted, the modified sequence passes through an algorithm called SPACE, which first defines the sonic and visual spaces inhabited.

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[72] This compilation contains a number of similar compositions made using the sound recording of Mann's reading,

[73] In Schenker's sense of a foreground, middleground, and background in a musical composition.

This approach creates an interface that allows the perceiver to influence the original sonic/textual gesture similarly to the way that they are able to influence the output of their physical gesture in MOTION. The difference here is that, instead of being the sole influence on the perceived result they become a contributor to that result, as their gestures and the sonic gesture of the poem coalesce to create the result.

Camera interface

In SPEECH, the camera is used to view the perceiver's immediate physical gestures for processing and subsequent presentation on screen. Unlike in MOTION the perceiver's gestures do not have a direct influence on the creation of the result; instead, the perceiver is simply represented on screen, filtered through the process, and their image has no impact on the real-time creation of the work other than that. SPEECH is most like Ono's *A Box of Smile* in this respect, in that the perceiver's image is re-contextualized through the process, and that is the only influence that they exert through their physical gestures.

Interpretation interface

The Interpretation interface for SPEECH has similarities to that of MOTION, as can be seen in Figure 25 and Figure 26. The intention here, as with MOTION, is to create an environment in which the perceiver influences the process to fit their experience of it to the aesthetics and predispositions at the time of perceiving.

There are over 100 possible controls in the interface divided into seven sections. A list these sections according to function follows.

- ON & OFF: here the process, camera, and audio are turned on or off, the computer space bar also has this function;
- STRUCTURE: here the sequence of phoneme ID numbers is organised, allowing for the sequence to be stepped through as a whole or in sections, and the direction of the sequence to be set;
- FORM: here the four numbers (called Elements in the interface), allocated to each phoneme ID are individually adjusted, forming a sequence of elements to be used in creating the sonic and visual outcomes;

- SPACE: here additional elements are added to the sequence, creating a multi-strand output[74];
- CAMERA ADJUSTER: here the camera's view of the perceiver is adjusted. This section is directly related to the output of HARMONIZE, the dimension, zoom and offset factors of the camera's view being set within the ranges allocated;
- IMAGE EFFECTS: here the image resulting from the adjustments made in CAMERA ADJUSTER are effected similarly to those of IMAGE EFFECTS in MOTION;
- VOLUME: effects the overall amplitude of the sonic result;
- SYNTHESISER: here it is possible to adjust the amplitude envelope and tuning of each of the sine wave synthesisers.

Again, there is a bank of presets (including some set by me) that allow the perceiver to store the parameters that they have chosen in the interface at the bottom of the screen. An example of the output of SPEECH can be seen in Figure 27, on page 113 .

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[74] STRUCTURE, COMPOSE, and HARMONIZE are developments of systems originally conceived and implemented in my Master of Arts research (Alsop 1999).

Figure 25: SPEECH interface without interpretation controls

Figure 26: SPEECH interface with interpretation controls

Figure 27: Screen image resulting form an interaction with SPEECH
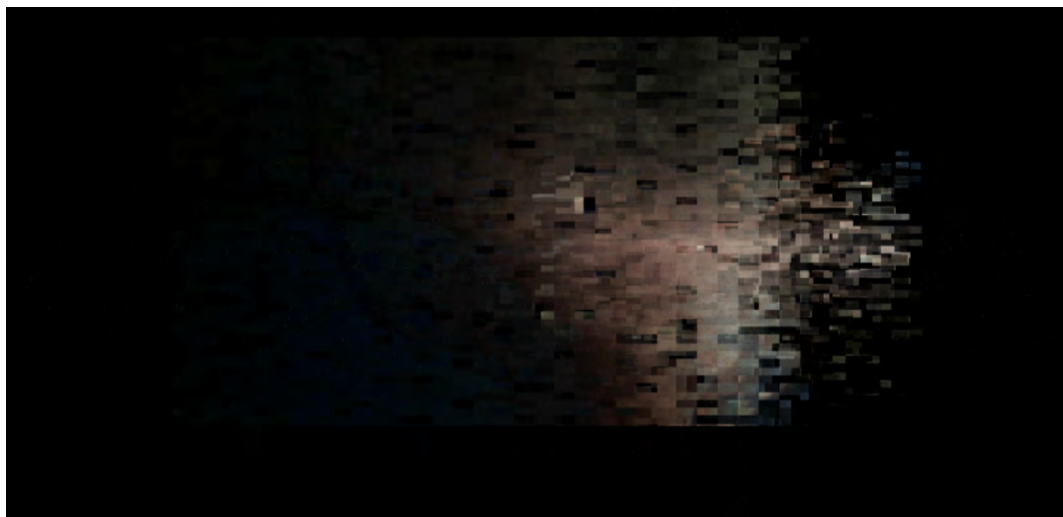
Creative decisions in developing the outcomes of SPEECH

Sonic decisions

SPEECH uses the sine wave synthesisers available in MAX/MSP/JITTER (© Cycling74, (Puckette, David Zicarelli et al. 2010)), in order to create sounds that are, as much as possible, non-descript and non-referential[75]. The process for generating melodies is based in the standard Western traditions of pitch and frequency interval as expressed in the MIDI system. Initially both COMPOSE and HARMONIZE use the equal tempered tuning and the harmonic system built on this. Traditional western harmony is built on a triadic, or a 'take one skip one' selection system, where the first, third, fifth, and so on, scale degrees are used to build the harmonic framework[76].

HARMONIZE allows the perceiver to choose the interval between selections, making a 'take one skip *n*' choice available. The frequency interval between the selected notes can then be multiplied by a floating-point number, allowing the interval to be shrunk or expanded further, and the result then transposed either higher or lower.

The resulting frequency numbers are then articulated through the SYNTHESISER, where five polyphonic synthesisers create a five-part polyphony. Each strand of this polyphony can then be retuned to fit between two perceiver set limits, allowing the parts to form their own timbres as the sine waves interact.

As with MOTION, the sounds are placed in a binaural space. The sonic motion is set by parameters linked to aspects of the textual gesture as expressed through the COMPOSE and HARMONIZE systems, prior to their articulation via the SYNTHESIZER system.

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[75] These sounds will naturally have an external reference, particularly in the realm of electro acoustic music. However they do not have the redolence of natural sounds, which may refer to place, time or 'nature', or orchestral sounds such as the piano, which can easily refer to the concert hall or to specific musical styles.

[76] There are harmonic systems other than the standard triadic system referred to here, such as the quartal system, based on fourths, or 'pick one skip two'.

Image decisions

The systems for affecting the image of the perceiver are similar to those used in MOTION. While the layouts of these have dissimilarities in their content, it can be seen, particularly in the adjustment and effects areas, that many of the methods for adjusting the image are identical.

Again, it is vital that the perceiver in the act of perceiving be an essential part of what is presented in the system. The act of perceiving a work is essential to that work, and that system bridges the gap between the maker and perceiver.

Concluding comments

Just as MOTION allows direct interaction between physical gesture and audio-visual gesture, SPEECH allows interaction between the physical gesture and mental gesture of the perceiver. The physical gestures these do not influence the outcome as intrinsically here as they do in MOTION, instead it is the translated spoken gesture of a poem that creates the structure of the process. The mental gestures are expressed through their interpretation of the process via the Interpretation interface that creates the resultant art-object.

SPEECH evolved from the idea of translating the structural map of a poem to the structural map of a piano composition. It has now developed into a system for the tripartite interaction between an ephemeral, corporeal gesture (the perceiver's physical actions while perceiving the process); a permanent, virtual gesture (the phoneme sequence of the poem); and a mutable, mental gesture (the perceiver's interpretation of the process according to their current paradigms as expressed through their interaction with the Interpretation interface).

As the core of this system is a permanent iteration of a textual speech gesture mapped to become an audio-visual gesture facilitated through a translation and consequent composition system. It is possible for this system to be used with other gestures at the core.

Again, the perceiver need not have a detailed understanding of the systems used. It is the perceiver of the process in the act of perception mapped through the textual gesture, which is in turn mapped through their interpretation and interaction with the audio-visual output, that creates the actual image seen on screen and the sounds heard. As with MOTION, it is the intention that this interaction be done intuitively and experimentally, so that the perceived result is a representation of the paradigms brought to the perception and subsequent interpretation of the art-object/process.

Chapter 9: VISION: Mapping saccadic motion to generate a n audio-visual outcome

Both MOTION and SPEECH consider the mapping of deliberate gestures as the fundamental activity in the development of their processes. By contrast, VISION considers the involuntary saccadic motion of the eye in this role.

Eye motion is usually considered to respond to an intentional, deliberate mental focus. Unlike ears, which continually and unreservedly hear everything from all directions, we need to decide on what to see through the positioning of our eyes. However, in order to maintain that focus, our eyes move at between 20 and 200 cycles per second (50 milliseconds and 5 milliseconds respectively), depending on how large the angle of movement is, up to a movement of about 60 degrees, after which point the velocity remains stable according to the capacity of the individual viewer's eye. As well as this lateral movement, the eyes also vibrate backwards and forwards, at a rate of about 60 oscillations per second over the very small distance of about 1/1,296,000 of a degree, again depending on the individual. These involuntary actions are required in order for the eyes to continue seeing, as the retina responds to changes in Colour and luminescence, and this information is sent to the brain for processing and interpretation.

The cochlea does not have a similar involuntary gesture, as it is a more reactive organ than the retina. It is able to passively absorb data without the deliberate, active intention required for vision.

The systems used in MOTION, SPEECH and VISION follow a similar trajectory to their audio-visual output. In MOTION the perceiver's image and movement creates the output; in SPEECH, the speech-to-audio-visual mapping process mediates that image.

In VISION the perceiver's image and physical gestures are filtered through the saccadic-like oscillation of the focus point at the centre of the camera's magnified image, which, as in SPEECH, is irrevocable and of which they have no awareness, other than that it is having an effect.

Simulating/approximating saccadic motion in VISION

VISION's process attempts to simulate this saccadic motion in the creation of an art-object follows this sequence:

- the camera captures in the perceiver's image,
- the captured image being duplicated (to simulate two eyes),
- the image being extremely magnified,
- the position of the magnified image being continuously shifted by a small amount,
- the two images being joined prior to presentation on screen.

This process does not attempt to be an accurate, computer based modelling of physiological saccadic motion; instead it uses the concept as a point from which to consider microscopic, unintentional physical gesture.

The gestures considered previously in MOTION and SPEECH are easily perceivable with the eye and ear, and can be represented in an abstract form (such as the written word or phonemic symbols), or in a notation (such as Laban and Benesh notations). There is also a continuum of scale developed here: from the overtly external gesture, the movement of the body as used in MOTION; to an internal/external gesture, the movement of the internal and external areas of the vocal tract, the diaphragm to the lips and nose, and the deliberate externalization of previously internalized air, as used in SPEECH; to the internal and ostensibly invisible[77] physical gesture of the eye, which both resides within the skull and does not move from there, as used in VISION.

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[77] Usually as we perceive any object we are unaware of the eye's saccadic motion.

Differentiating VISION from previous approaches to integrating internal gestures in interactive audio-visual outcomes

Systems for mapping internal physical phenomena to a sonic or visual output have become prevalent in medicine since the developments of the electrocardiograph (ECG) and the electroencephalograph (EEG). In both these systems invisible real-time changes in the body are mapped as visual representations in order to diagnose differences from the norm.

Mapping changes in brain waves as detected by EEG systems to audio or visual results is not uncommon. This kind of technology was used by Alvin Lucier in his 1965 piece *Music for Solo Performer* (1982), in which "enormously amplified brain waves" were used to excite percussion instruments resting on speaker cones (Kim-Cohen 2009, p.187). According to Dan Wu et al (2010, p. 1) "The earliest attempt to hear brainwaves as music was made in 1934", Now this process is used in systems ranging from hacks on games technology such as Mindflex (Mattel 2010), by Robert Schneider (2010), or the use of existing technology such as that supplied by Arduino (2011) and the Interactive Brainwave Visual Analyser (IBVA 2011).

Processes have been created from collaborative/group based brainwave interaction, such as that of James Fung (daftcyborg 2007). This discussion cannot properly indicate the breadth of approaches taken to this kind of interface; as EEG technology becomes more available and easier to interface with, computer technologies uses this approach to cause sonic events will proliferate.[78]

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[78] This is by no means a comprehensive listing of approaches to mapping internal physiological functions to art works/processes.

In these cases, the process is a mapping of one gesture, a conscious thought, to another sonic gesture. What is in fact happening is similar to that of any other gesture-mapping interface, such as a piano or paintbrush, where a piece of technology is used to make tangible an intangible object. However, in these systems there are no cues to influence the mapping process. Often an action such as raising the hand will imply an increase in frequency or amplitude; a pianist leaning forward after striking the piano keyboard may create a sense in the perceiver that the sound is louder or more intense; or a large brush stroke may create a sense in the perceiver of greater vigour in the painting[79].

Systems for computer based mapping of other invisible, physiological human activity to an art outcome are fewer. Examples of systems that use this kind of input in musical settings include: Lipo's patent application for Synchronizing Music and the listener's heartbeat (2007); Marrin Nakra's Conductor's Jacket (2000; 2001) (which includes "electromyography sensors measuring muscle tensions, a heart rate sensor, a respiration sensor and also temperature and galvanic skin response sensors" (Bradshaw and Ng 2008, p. 36)), and the Bio-Music platform, which uses the "ProComp Infiniti biofeedback system capturing EMG [Electromyography], ECG, BPV [Blood Pressure Volume], GSR [Galvanic Skin Response], respiration and temperature signals" (Benovoy, Brouse et al. 2007, p. 7) to create audio-visual output.

The approaches considered above usually require a real-time physical action by the performer/perceiver. Marrin Nakra's Conductor's Jacket and the Bio-Music platform map internal gestures that occur with and as a function of larger, external gestures, and Lipo's heart rate monitor synchronises music to the heart rate of the perceiver in a physical state, which may range from resting to very energetic movement such as dance; and save for the EEG/brain wave mapping systems, this state results from the external physical actions of the perceiver.

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[79] Pollock's paintings are a good example of this perception of vigour.

Like the EEG based processes, VISION does not depend on the external actions of the perceiver, and, like the brain waves mapped in brain wave sonification, the perceiver is usually unaware of the saccadic gesture as it is occurring. In VISION the mapping systems used are not based on physical actions as they are occurring; instead they are an approximate abstraction of this gesture, designed, similarly to that of SPEECH, to filter the physical gestures of the perceiver in the act of perceiving. The phoneme-based system that influenced the gesture mapping in SPEECH has much history; by contrast, the system used in VISION has been invented specifically in order to explore some potential results of mapping minute physical gestures to an audio-visual outcomes.

Computer interactions

In VISION, as in SPEECH, the role of the perceiver's physical gestures are filtered through the intentions of the maker, as expressed through the Interpretation interface and their interpretation of the audio-visual result. However, in SPEECH, the gestural filter used is based on the order of the poem's phoneme sequence. While the perceiver can adjust and interpret this, they may only do so within the phoneme sequence's well-defined parameters. In VISION, this filter is less defined and more open to the perceiver's interpretation.

While these systems are based on the concept of saccadic motion, it is possible for the perceiver to make adjustments that cause the systems to behave outside of that paradigm. This allows the perceiver a greater interaction with the process when implementing their interpretation, offering ways for the perceiver to represent himself or herself more clearly in the outcome than in MOTION or SPEECH.

The approaches discussed earlier in this chapter are temporally based: the movement of a conductor or the rhythm of a heartbeat, for example. While the saccades are temporal, their time frames are barely perceptible. In VISION it is possible for the perceiver to set time frames for the simulated saccadic motion ranging from approximately one millisecond to a technically infinite time period, creating a static image when interpreting the audio-visual outcome.

Camera interfaces

In VISION the camera has a similar role to that in SPEECH, capturing the perceiver's physical gestures while viewing the audio-visual outcomes. This input is then processed and presented on screen according to the parameters that they have set in the Interpretation interface.

The interaction of the camera input in VISION differentiates from SPEECH in one significant way due to the process for generating the audio component of the output; this is discussed further in Sonic decisions, on page 123.

Interpretation interface

The Interpretation interface is similar to that seen in MOTION and SPEECH, as seen in Figure 29: VISION interface with interpretation controls, on page125. Again the interface is separated into sections appropriate to the goals of VISION, these are:

- ON & OFF: turning the process, camera, and audio on or off, again the space bar has this function;
- EYE ONE and EYE TWO: here the camera's view of the perceiver is adjusted, which is set according to the parameters decided on by the perceiver;
- BOTH EYES: is used to set the blend mode of the two EYES: and the initial focus point, and parameters for both eyes;
- IMAGE EFFECTS: here the image resulting from the adjustments made in EYE ONE and EYE TWO image are effected;
- SYNTHESISER: here it is possible to adjust the amplitude of each of the noise-based synthesisers, the global compression for each synthesiser, the binaural spatialization, and the overall amplitude.

As with the two previous systems, presets are included, allowing the perceiver to store the parameters resulting from their interpretation of the process.

Creative decisions in developing the outcomes of VISION

Sonic decisions

VISION uses a subtractive synthesis system; here pink noise is sent through eight filters, which have their parameters set by the RGB values of the camera's input at various times as it travels from the camera to the screen[80]. At each of these points the RGB values change, resulting in different frequencies being subtracted from the original pink noise: this process references that used in Image decisions, below, where only a very small section of the overall sound available may be heard.

This causes up to eight different sounds being heard[81], which are then mixed by the perceiver using the eight-channel mixer seen in the SYNTHESISER section of VISION's Interpretation interface. This audio signal is then sent to a compressor in order to smooth out the extremes in amplitude, and finally to a binaural spatialization system similar to those used in MOTION and SPEECH, for listening in headphones.

Image decisions

The resultant image seen in VISION is the perceiver in the act of perceiving after having been filtered through the EYE and IMAGE EFFECTS systems available in the Interpretation interface. As with SPEECH, the perceiver's movements do not influence the systems or their outcomes. However, it is possible that they will see changes in the on screen image as they move while perceiving it; if this is a desired interpretation of VISION, it can be achieved through experimentation.

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[80] These are: magnification, edge detection, Colour management, pixilation, and blurring.

[81] It is possible that the output of one of the filters has an amplitude of zero at any time while VISION is being presented/perceived.

The image system takes its cue from the subtractive approach outlined in Sonic decisions. It focuses the viewer on a minute section of their image, making just a small section of their image available to be used in the system. This section is moved in a quasi-random way, and the distances travelled set by the perceiver, it is then magnified to inhabit the entire screen.

Figure 28: VISION interface without interpretation controls

Figure 29: VISION interface with interpretation controls

Figure 30: Screen image from an interaction with VISION

Concluding comments

VISION does not have the same goal as resides in MOTION or SPEECH, mapping an easily observable gesture in the creation of an audio-visual result. Instead it maps the invisible and involuntary action of the eye; doing this by focusing on a miniscule portion of the captured image of the perceiver and then requiring that the perceiver adjust the resulting on-screen image in order to suit their interpretation of the output according to their immediate paradigms. In doing so they directly influence the sounds heard, which then influences their perception of the entire audio-visual object.

This loop brings a suitable conclusion to the three art-objects presented. The three systems move from the exo-body gestures in MOTION, through the exo/endo-body gestures of SPEECH, to the almost completely internal gesture of VISION. In each of these systems there is the requirement that the perceiver interact with the work not only as an exo-object but also mentally via the Interpretation interface, with the invisible and utterly idiosyncratic gestures of their thoughts. Through these systems those gestures then become as much an ingredient of the actual art-object, its result, and its potential for interpretation as the object itself.

The following chapter, Conclusions, discusses the three art-objects as a body of work, summarizing the approaches taken to each through the lens of an art maker and perceiver.

Following that is a summary of the conceptual frames and how they are addressed in these art objects. And finally there is a brief discussion of potential developments of the systems and how they may be used to develop further works.

Final comments

Transcending boundaries between the various elements that make up an artwork is a core impulse in my practice. The nexus of these elements is the intangible, and immediate experience within the perceiver; and this experience is what transcends the boundaries; MOTION, SPEECH, and VISION attempt to manifest this.

A Möbius strip is a powerful analogue for describing the relationships between the elements that make up an artwork. Figure 31, below, shows eight of the almost infinite variety of possible interactions that make the experience linked by a Möbius-strip like path. As it is possible to traverse both sides of a Möbius strip without leaving either; and it is simultaneously also possible to touch the opposite sides of a Möbius strip, this path simultaneously provides a single-sided/both-sided interaction between the elements.

For example: writing *perceiver* on one side of the strip, and *maker* on the exact opposite side of the strip intuitively indicates that these are two opposing sides to experiencing an artwork. However, drawing a line along it from the 'm' of *maker* to the 'r' at the other end of the word, the line would travel through the word *perceiver*, and vice versa. This shows that while the *maker* and *perceiver* are ostensibly on opposite sides of the strip there is an unbroken connection between via which both traverse.

Figure 31: Nexus of interrelations between elements in experiencing an artwork.
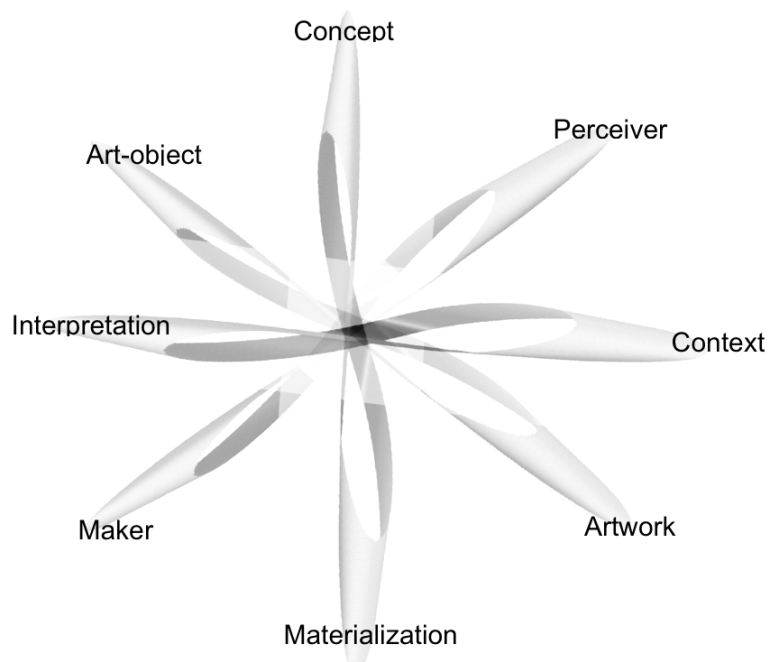
This incongruity indicates, for example, that a concept and its materialization are simultaneously on the same and different sides of a single path. Which then allows apparently incongruous concepts such as; *As I make a work I am perceiving it*, and *As I perceive a work I am making it*; or *As I interpret a work I contextualize it*, and *The contexts I apply cause my interpretations*, to simultaneously exist.

Figure 31 is a simplified version of the possible interactions between these elements; for example, it is possible to link more than two elements, such as Maker, Artwork and Context, through the nexus in the same way.

Discussing the art-objects

MOTION, SPEECH and VISION comprise of two equally important strands in their creation: one being the mapping of gestures across art forms, the other being the creation of intangible art-objects.

They map the physical and the mental gestures of their perceiver, transforming them into the audio-visual art-objects. These objects require the perceiver's interaction, via the camera and the computer keyboard, in order to exist. They are designed to furnish an experience within their perceiver, and made as much by the perceiver as the maker, thus they are in constant, mutating flux, and being so, are intangible. This interaction creates the unique art-object that causes the artwork experienced by the perceiver.

These art-objects achieve this through: integrating the physical and mental gestures of their perceiver; the gestures of making, perceiving and interpreting having similar potency in creating the experience of the artwork; and their outcomes being dynamic and impermanent.

They bring artificial, designed, naturally occurring, internal and external, conscious, unconscious and unknown gestures together in a dynamic, Möbius-strip-like, vortex of *encompassing* process[82], in which these gestures separate and blend, reduce and enlarge, and come forward and recede.

Like all art-objects, MOTION, SPEECH and VISION are pointers to a possible experience within their perceiver, made at least as much by the perceiver as it is by its maker. They are designed to cause continual reinterpretation by the perceiver while in the act of perceiving them, to be in constant flux, intangible and ephemeral, mutating to form new and momentary experience(s).

The mapping of gestures from one form of expression into another is a crux of the systems presented here; as is the creation of art-objects that cause their perceiver to actively interpret object through adjusting it to fit their paradigms. Through this process the gesture of perceiving the object is given similar potency to the gesture of making it, forming an equal as possible partnership between the creator and perceiver, resulting in a dynamic process residing within the perceiver[83].

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[82] As shown in Figure 18. Page 82

[83] As shown in the centre of Figure 17, page 82

Mapping physical and mental gestures

MOTION, SPEECH, and VISION each map physical and the mental gestures onto audio-visual art-objects. The mapping processes for the bodily, lingual, and ocular gestures of MOTION, SPEECH and VISION follow the trajectory from large to small, have a physical manifestation, and can be interpreted through a notation system. They acknowledge that these gestures may be deliberate or unintentional, conscious or unconscious, and easily perceivable or not. These gestures have equal impact on each art-object.

The systems used in MOTION, SPEECH and VISION follow a similar trajectory to their corporeal locations.

- In MOTION, the perceiver's bodily gestures are mapped via the twenty video-capture areas to trigger responses[84] while perceiving the work. This response is mediated by the perceiver's mental interaction mapped through the Interpretation interface.
- In SPEECH, the motions of the mouth when speaking the English language mediate the image of the perceiver as they perceive the work and prescribe the sounds triggered. This is also mediated by the perceiver's interaction with the Interpretation interface.
- In VISION, an interpretation of the saccadic motion of the eye mediates the image of the perceiver and consequently the sounds heard. This interpretation and its expression is also influenced by the perceiver's interaction through the Interpretation interface.

MOTION, SPEECH, and VISION make the perceiver's influence on an artwork explicit. They show that the perceiver is always active, even if they have the illusion of being passive. That the artworks are made up of the perceiver in the act of perceiving and interpreting what they perceive contributes to the Möbius-like relationship between each of the elements shown in Figure 31. They provide a metaphor for the influence the perceiver has over an artwork through their gestures, history and opinions.

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[84] This is discussed in Area/gesture-based interaction, on page 99, and in Camera interface, on page 100.

Figure 32 shows the mapping of physical gestures into the objects. The perceiver's mental gestures are actuated through the adjustments they make via the INTERPRETATION INTERFACE, affecting their GESTURE as represented in the ART-OBJECT. This offers a simplified image of the relationships between the perceiver's physical gestures, the Interpretation interface through which the perceiver implements their mental and interpretive gestures, and the resulting art-object unique to their interaction with and perception of MOTION, SPEECH, and VISION.

Figure 32: Procedure of creating MOTION, SPEECH and VISION.
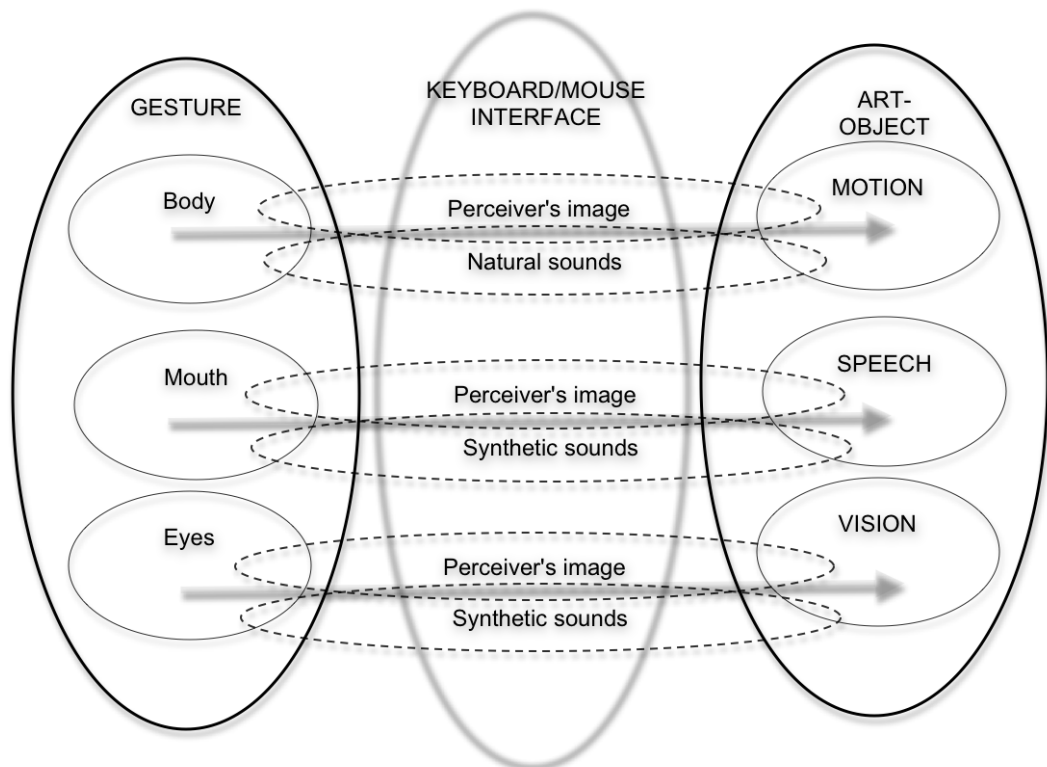
Table 2 below briefly outlines the progression of the gestures through the three art-objects made. This table indicates the various taxonomies of gesture that make up each of the art objects, and how or whether-or-not they are implemented in the perceiver's unique making of their unique art-object.

Table 2: Gesture types in relation to MOTION, SPEECH and VISION

GESTURE TAXONOMIES	ART OBJECTS		
	MOTION	SPEECH	VISION
Size	Large	Medium	Small
Natural or Learned	Natural	Learned	Natural
Designed	Yes	Yes	No
Internal	No	Yes	Yes
External	Yes	Yes	No
Physical	Yes	Yes	Yes
Mental	Yes	Yes	No
Deliberate	Yes	Yes	No
Unintentional	No	No	Yes
Conscious	Yes	Yes	No
Unconscious	Yes	Yes	Yes
Perceivable	Yes	Yes	No
Unperceivable	Yes	No	No

Discussing the conceptual frames

This project has been an attempt to articulate and coalesce a broad range of

systems, processes, concepts, understandings and so on, that have previously

formed the webs and intersections informing my approach to art making. The

range of conceptual frames that inhabit this project is large.

To summarise:

- Computer based systems provide a pivot around which all material and
  conceptual objects can revolve.
- The computer considers everything as data.

- Data can be represented as a gesture, without requiring the reification of that gesture.
- Most art-gestures, when reified, address the sonic and/or visual senses.
- All gestures are interpreted and reconciled according to the paradigms of the perceiver at the time of perception.
- There are articulated, conscious and unconscious processes that the perceiver uses to make sense of what they perceive.
- The art categories are re-definable according to the needs of the perceiver.

The exploration of my responses to art-objects, discussed in Chapter 3, both reflects and creates these conceptual frames, as each of these objects has altered my perception of art, the way I perceive and interpret art, and myself.

I have an abiding sense that all things are more similar than different. What creates a sense of difference is not recognising connecting consensual context(s). This lack can be bridged by first acknowledging the attending contexts, as Lyotard and Jakobson did, and then inventing contexts that ignore the differences, as Cage did. The approach forms a *consensual horizon* that both links and transcends Lyotard's *differend*, subverting the heterogeneity of those *regimens* suggested in Figure 31.

Kansei and Notation are contexts and systems through which this bridge can be built. Kansei provides a context in which an object or event is considered as only aesthetic, and where the process of creating is also the process of perceiving the creative result. Notation provides a complementary reflection of this, a context where the object is stripped of its original aesthetic values and reinterpreted as pointers to possible aesthetic results.

Finally, and most importantly, any art-object is a pointer to a unique experience within its perceiver, just as a note in a musical score is a pointer to a sound. This experience is entirely and immediately dependent on the contexts, similarities and differences encasing the art-object, and the transcendence of those is what the art-object inspires.

Creating intangible art-objects

Creating an intangible art-object suggests an oxymoron, and an impossible task. This is project is an attempt to reconcile this incongruity. It attempts to reconcile the differences between addressor and addressee, maker and perceiver, and so on that these differentiations engenders.

The objects MOTION, SPEECH, and VISION can be considered as processes for engaging in the making of an artwork. They are not the software or physical objects perceived, instead they are the act or process of perceiving. As such they become intangible.

That perceivers need not have an understanding of the effect of their interactions is significant. This reflects the fact that most interactions are based on subconscious and unknown, and therefore intangible internal interactions.

The intangible artwork lies as an experience within the perceiver, one that is in constant, ephemeral evolution based on the constant reinterpretation that the perceiver brings to the object. MOTION, SPEECH, and VISION attempt to articulate this by being in constant change, rearticulating the perceiver's experience of them each time that are experienced.

Potential developments

It is impossible to fully articulate all of the influences on my practice and its development over the duration of this project adequately. It is also impossible to demonstrate the breadth of possibilities that lie within the three art-objects.

These art-objects are systems that allow temporal, physical, mental, and locational differences to be transcended through the perception, interaction, and interpretation of their perceiver.

The mapping of gestures from one form of expression into another is a crux of the systems presented here; as is the creation of art-objects that cause their perceiver to actively interpret object through adjusting it to fit their paradigms.

MOTION, SPEECH, and VISION interpret something external, and this allows them to be used in many situations. For example, MOTION can be used to map the motions of leaves in trees, or people on streets in creating and audio-visual outcome; SPEECH can use the mapping of any notation-system to create a structure, or use a visual input other than the perceiver, such as photographs or a moving image; and VISION can interpret any visual input to create an audio-visual outcome. These aspects allow MOTION, SPEECH and VISION to be used in a number of contexts, the range of which is up to the user.

Concluding remarks

The creation of these art-objects and the processes used to develop and contextualize them has resulted in a new understanding of the art-making/art-perceiving process. Seeing and articulating this not as a single and linear trajectory process, but as a mutual and looping process, in which the perceiver has as strong a role in the experiencing of an artwork as its maker has resulted in the making of these art-objects. This has formed a new direction in my art-making, one that considers the mutual and evolving nature of the experiencing of an artwork to be the role of creating and artwork.

MOTION, SPEECH, and VISION show a possible way of articulating this by creating a process that is unique to each perceiver, as they are perceiving the art-object.

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VOLUME 2

APPENDICES

**MAPPING GESTURES IN THE
CREATION OF INTANGIBLE
ARTWORKS**

ROGER ALSOP

Appendices

Chapter 1 Appendix

Examples of mapping gestures across art forms

The four images that follow demonstrate examples of interpreting images from one art form into another. The purpose of these descriptions is to demonstrate quite natural, and perhaps universally agreed, mappings of gestures across media.

Figure 33: Naming images
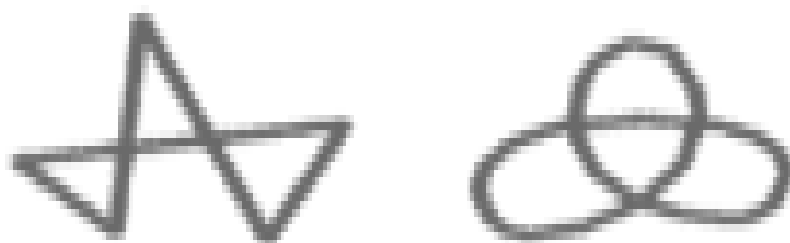
Figure 33: Naming images, above, shows two images, named either Naluma or Taketa[85] (Lexicon 2007). In most cases a relationship between the sounds of these names and the images is made, with the left most being called Taketa and the right Naluma. A physiological reason is that the unvoiced dental-plosive /t/[86] and velar-plosive /k/ of Taketa indicates a change as both phones require stopping then releasing the airflow of the unvoiced consonants. Conversely naluma is entirely voiced, nasal, and labial glides, where the airflow is not stopped. These factors influence the way in which the words are heard at an instinctual level. The forward motion of the lips and tongue in "naluma" engenders openness, and the backwards motion in "taketa" engenders defensiveness.

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[85] These images have also been called Taketa and Maluma.

[86] /t/ can also be describes as an alveolar plosive.

They "can also be seen as larger movement gestures than those of the vocal tract. "Naluma" could be seen as representing flowing movements and rotational forces in a choreography, and "Taketa" as representing jagged movements and linear forces." (Alsop 2007), were they to be considered as representing temporal and motional outcomes.

In conversation, Jeff Pressing once described Jimi Hendrix as embodying a "one to one mapping of physical and sonic gesture". Seeing video of Hendrix' performances it is difficult to imagine one without the other. Figure 34, below, demonstrates this intrinsic and coherent relationship between his physical movement and the sound/music being expressed.

Figure 34: Jimi Hendrix expressing sound physically

Alternatively, the two images of Hals's paintings do not have any direct relationship between sound and vision. However, when I first saw them they immediately struck me as musical scores. Simply placing a horizontal five-line grid over them, as seen in Figure 35 and Figure 36, below, shows that the positions of faces and hands can indicate the positions of pitches on a stave.

Figure 35: Hals Regents of the Old Men's Almshouse (1664)

Figure 36: Hals Regentesses of the Old Men's Almshouse (1663)
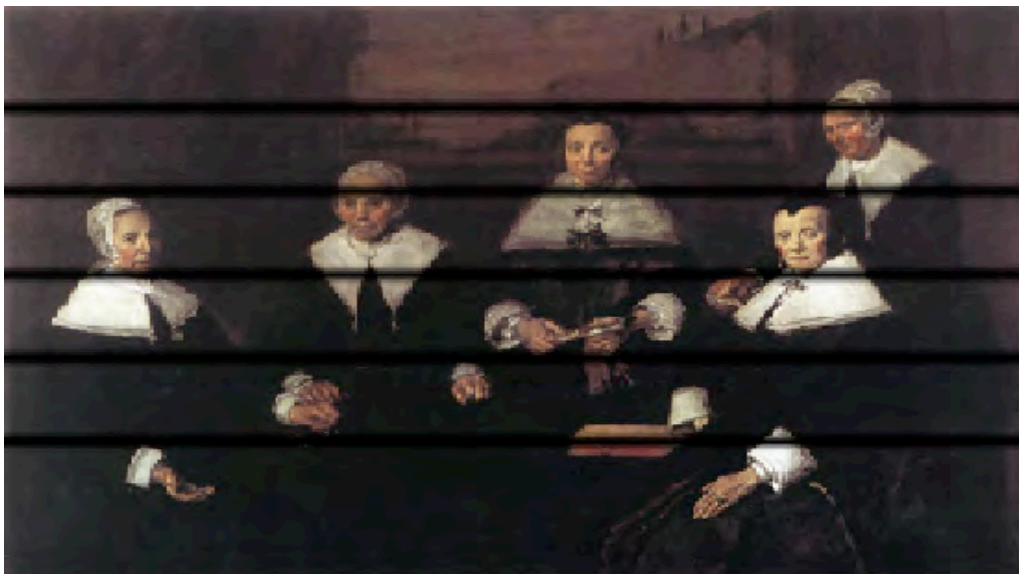
The perception of relationship was explored by Carol L. Krumhansl (2002) using Balanchine's choreography to the Minuetto from Mozart's Divertimento no. 15. Krumhansl divided the participants into three groups:

> One … heard the music. A second group only saw the dance. A third group both heard the music and saw the dance. All groups made real-time judgments of when sections ended, when new ideas occurred, and the amount of tension and emotion expressed. [The result] suggests that … temporal organization operates in both music and dance, and that the two artistic forms are closely coordinated.

Figure 37, on page 158, shows similar perceptions of emotional states, regardless of the input to the participant.

In addition, the participants judged the emotional quality of the stimulus. [… These] judgments were remarkably similar across the conditions. …. Analysis of the music and dance suggested a number of features that may convey the shared emotional qualities. These include the tempo of the music and dance, melodic and choreographic gestures, and the high degree of symmetry and regularity in both music and dance. Additional factors may be the pacing of segment endings and new ideas, and the experienced contours of tension and emotion. The finding that music and dance can express such similar emotional qualities suggests nonaccidental relationships between music and bodily movement.

Figure 37: Relationship between emotional responses to selected sonic and visual input (Krumhansl 2002)
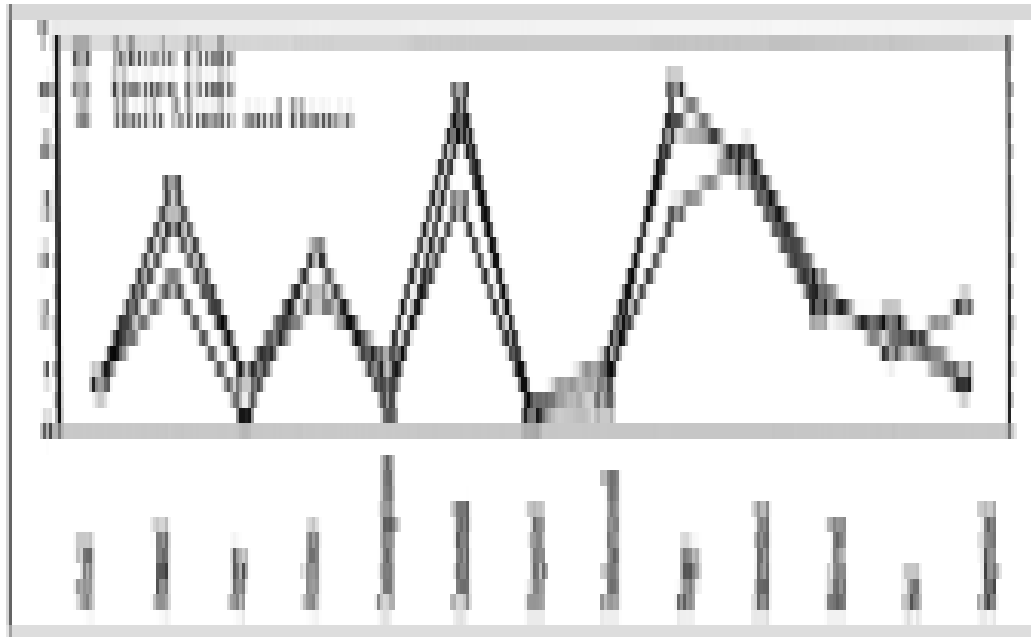
Similar emotional responses to the larger scale structures of music and dance indicate an intuitive recognition of similarities between sonic and physical gestures.[87] (*Compositional Processes in Developing Poly-Media Performance Works*)

---

[87] The preceding section is a condensation of the paper Compositional Processes in Developing Poly-Media Performance Works (Alsop 2003).

Chapter 2 Appendix

Processing code for La Monte Young's *Composition 1960 #10*

[LineFollow2D](#)

 Code created by djones on 29 Apr 2008 (http://instructionset.org/instruction/4/)

```
// LineFollow2D

// dxjones @ gmail.com

class Vector {

float x, y;

Vector(float _x, float _y) {

x = _x;

y = _y;

}

void set(float _x, float _y) {

x = _x;

y = _y;

}

}

final int N = 120;

Vector[] p = new Vector[N];

Vector[] v = new Vector[N];

void setup() {

size(600,400);

frameRate(60);
```

```
smooth();

p = new Vector[N];

v = new Vector[N];

initialize();

}

void initialize() {

int i;

for (i = 0 ; i < N ; ++i) {

p[i] = new Vector(random(0,width), random(0,height));

v[i] = new Vector(random(-1,1), random(-1,1));

}

}

void randomize() {

int i;

for (i = 0 ; i < N ; ++i) {

p[i].set(random(0,width), random(0,height));

v[i].set(random(-1,1), random(-1,1));

}

}

void mousePressed() {

randomize();

}

void normalize() {

int i;

float mx, my;
```

```
mx = 0;

my = 0;

for (i = 0 ; i < N ; ++i) {

mx += p[i].x;

my += p[i].y;

}

mx /= (float) N;

my /= (float) N;

for (i = 0 ; i < N ; ++i) {

p[i].x -= mx;

p[i].y -= my;

}

mx = 0;

my = 0;

for (i = 0 ; i < N ; ++i) {

if (abs(p[i].x) > mx) {

mx = abs(p[i].x);

}

if (abs(p[i].y) > my) {

my = abs(p[i].y);

}

}

mx = 0.95 * (width/2) / mx;

my = 0.95 * (height/2) / my;

for (i = 0 ; i < N ; ++i) {
```

```
p[i].x = width/2 + mx * p[i].x;

p[i].y = height/2 + my * p[i].y;

}

}

void draw() {

int i, j;

background(0);

normalize();

for (i = 0 ; i < N ; ++i) {

j = (i+1) % N;

v[i].x = 0.83 * v[i].x + 0.0125 * (p[j].x - p[i].x);

v[i].y = 0.83 * v[i].y + 0.0125 * (p[j].y - p[i].y);

}

for (i = 0 ; i < N ; ++i) {

j = (i+1) % N;

p[i].x += v[i].x;

p[i].y += v[i].y;

}

strokeWeight(4);

stroke(255,0,0);

noFill();

for (i = 0 ; i < N ; ++i) {

j = (i+1) % N;

line(p[i].x,p[i].y, p[j].x,p[j].y);

}
```

```
noStroke();

fill(255);

for (i = 0 ; i < N ; ++i) {

ellipse(p[i].x,p[i].y,12,12);

}

}
```

Andrew Bulhak and Alan Sokal using syntax to make sense

The 'Post Modern Essay Generator' (Bulhak 1996) is an example of syntactical aspects of a text being appropriate for its context while the actual content of the text is created without the intention to communicate meaningful ideas. An example from Forgetting Lacan: Neostructuralist textual theory in the works of Cage, created by the Post Modern Essay Generator follows:

> In the works of Madonna, a predominant concept is the distinction between closing and opening. Thus, the subject is interpolated into a neostructuralist textual theory that includes language as a paradox.

Each essay is unique as it is generated when the web-based program is run; therefore replicating the essay is impossible. When reading a generated essay the reader 'suspends [their] disbelief', a typical request of a theatre audience, creating an openness in the reader that assumes the essay does have validity.

Another example of the desire to make sense in text is seen in Alan Sokal's essay Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity (1996) originally published in *Social Text* as a refereed paper. Sokal wrote this paper in order to test the notion:

> Would a leading North American journal of cultural studies -- whose editorial collective includes such luminaries as Fredric Jameson and Andrew Ross -- publish an article liberally salted with nonsense if (a) it sounded good and (b) it flattered the editors' ideological preconceptions? (Sokal 1996, para. 4).

He followed this with <u>Transgressing the Boundaries: An Afterword</u> (1996) in which he discussed the roles of social/literary and anthropological thinkers in developing a sense that a scientific study of objective facts is of reduced relevance compared to a subjective experience, the "currently fashionable postmodernist/poststructuralist/social-constructivist discourse." (Sokal 1996, para. 10) Now, quoting Eric Hobsbawm, that in certain university departments "all "facts" claiming objective existence are simply intellectual constructions" (Sokal 1996, para. 13) and that "speculative theories passed off as established science; strained and even absurd analogies; rhetoric that sounds good but whose meaning is ambiguous; and confusion between the technical and everyday senses of English words" (Sokal 1996, para. 8) had become acceptable in the humanist fields of discourse. His concern was that this approach could cause a self-referentialism that has a negative social impact.

These examples indicate the penchant for accepting syntactically correct and suitably 'authoritative' statements to be acceptable.

Jabberwocky: an example of nonsense words that follow the syntax of the English language letter order

Lewis Carroll's Jabberwocky is an example of nonsense words that follow the syntax of the English language letter order and are interspersed with proper English words. The first stanza is below.

> 'Twas brillig, and the slithy toves
> Did gyre and gimble in the wabe;
> All mimsy were the borogoves,
> And the mome raths outgrabe. (sourced from Lim 2009)

Here there is a total of eight English words: 'Twas, and, the, Did, gyre, in, All, were (with seven repetitions), and ten non-English words: *brillig, slithy, toves, gimble, mimsy, borogroves, mome, raths, outgrabe*. The non-English words have the role of verbs and adverbs, and nouns and adjectives, which allows greater latitude from the reader as we are more used to encountering descriptions, and their modifiers, that we are unfamiliar with.

When I read the passage the mental image conjured up in me is of *toves,* some kind of benign mammal with vaguely humanistic qualities*,* gamboling by the sea on a sunny day. This can be a result of the consonance between *brillig* and brilliant, *gimble* and gambol, and the assonance between *wabes* and waves, and *mimsy*, which adds whimsy to my mental image due to the assonance with that word.

Just as "Colourless green ideas … ", can be constructed as a set of pointers to lexical metaphors, Jabberwocky can be seen as a set of pointers to sonic metaphors, in which there is an onomatopoeic relationship between a sound, as notated in the text, and a sense of what that word-sound denotes or connotes.

Also, in Jabberwocky the nonsense words all follow the syntax of English spelling and word-sound construction. It is seen that aberrations, such as the word *zloty*, referring to a Polish coin, are not used. Zloty is a word that uses two glides, /z/ and /l/, consecutively; and this is not an appropriate use of English language sounds.

As these words fit with in the expected structure of the English language their resonances may be deeper than simply the semantic/lexical content of the sound/words. This harks to a premise put forward by Alexander Stein (2007, p.81), that

> Each of us holds private memories of sounds that have colloquial and idiomatic meanings, carry affective over and under-tones …, word sounds and sound meanings that are evocations or reminders of pastness or that preserve relational moorings and associations.

This is how concatenations and coalescences of sounds that seem to have little natural relationship or relevance, or any other input for that matter, can create a very strong sense of relationship or relevance, and consequently meaning in the perceiver.

Choice creates syntax

The Indian chromatic scale is similar to the Western chromatic scale, consisting of twelve notes, or *swaras* from which a seven note scale is abstracted. However, according to

> ancient theory, the Indian scale was said to consist of twenty-two notes all together, with an additional ten microtones, or "in between" notes, that are unnamed … [and] impossible to demonstrate in writing … Instead they can only be heard in performance. (Lavezzoli 2006, p. 21)

These twelve pitches are of unequal intervals using the 'just intonation' system in which intervals between pitches are based on ratios of the harmonic series folded to fit into the octave, as are the ten 'in-between' notes, the frequencies of which it seems are left to the interpretation of the performer. The ratios of the twelve written *swaras*, or pitches are shown in Table 3, below. This table also shows the Western 'equal tempered' scale, which is based on equal divisions of the octave, resulting in differences between each semitone of one hundred cents[88], not the varying differences between notes of the 'just' scale.

This difference is of great consequence in the evolutions of the two musical styles, the Indian style is more oriented to structures based on melodic and rhythmic, or horizontal, variations, whereas the European style is more based on harmonic, or vertical or stacked, variations in their respective structuring processes.

Western art music developed an increasing desire for timbre variation and for simultaneous melodies to be performed with the same timbre groups. This began with the early development of polyphony in ritualistic vocal liturgical music around 850 AD and continued into the Renaissance, where the focus of composers came to consider the vertical, simultaneous musical event as being a significant element of the horizontal, temporal motion of the composition. This need found its expression in the development of equal temperament intonation as its *lingua franca*, allowing a wide variety of sounds to be presented simultaneously and the possibility of modulation between key/tonal centres.

While Indian art music developed from a similar source to Western art music, providing a cause for transcendent experience in the listener, it developed into a system that placed, and continues to place, a priority on melodic aspects and the interpretation of melodies by performers *in situ*.

---

[88] A cent is a 1/100th of an equal tempered semitone, and is considered the 'just noticeable difference' between two adjacent pitches. As the difference between octaves, when considered in frequencies, increases exponentially, so does the difference in frequencies of cents as the pitch/frequency area increases, for example, the difference between A1 - 110Hz and A2 – 220 Hz is 110 Hz, but the difference between A4 440 and A5 – 880, an octave higher, is 440 Hz.

In Indian music the 'drone' has a similar, function to the 'harmony' of western music, in that it usually provides a context, or background, in which a melody is supported or contrasted. The main difference is that in western music this contrast or background shifts dynamically, typically in response to the melody, and in many situations, such as playing improvised jazz, prescribes the movement of the improvised melody. However, in Indian music the drone is static, forming a foundation upon which "every melody" can be played.

That there was a preference for a musical tradition that used a sonic system based on a natural division of the octave in order to facilitate cultural expression, as in Indian music, and another that preferred a more arbitrary division of the octave in order to facilitate a facet of its culture, as in Western music, resulted in fundamental differences in how the different musics can be structured. Consequently their syntaxes developed differently, with Indian music being monodic, basing its processes on a melodic line, and Western music being polyphonic, basing its structures on the interaction of multiple melodies.

Figure 38: Effect of tuning systems on musical syntax
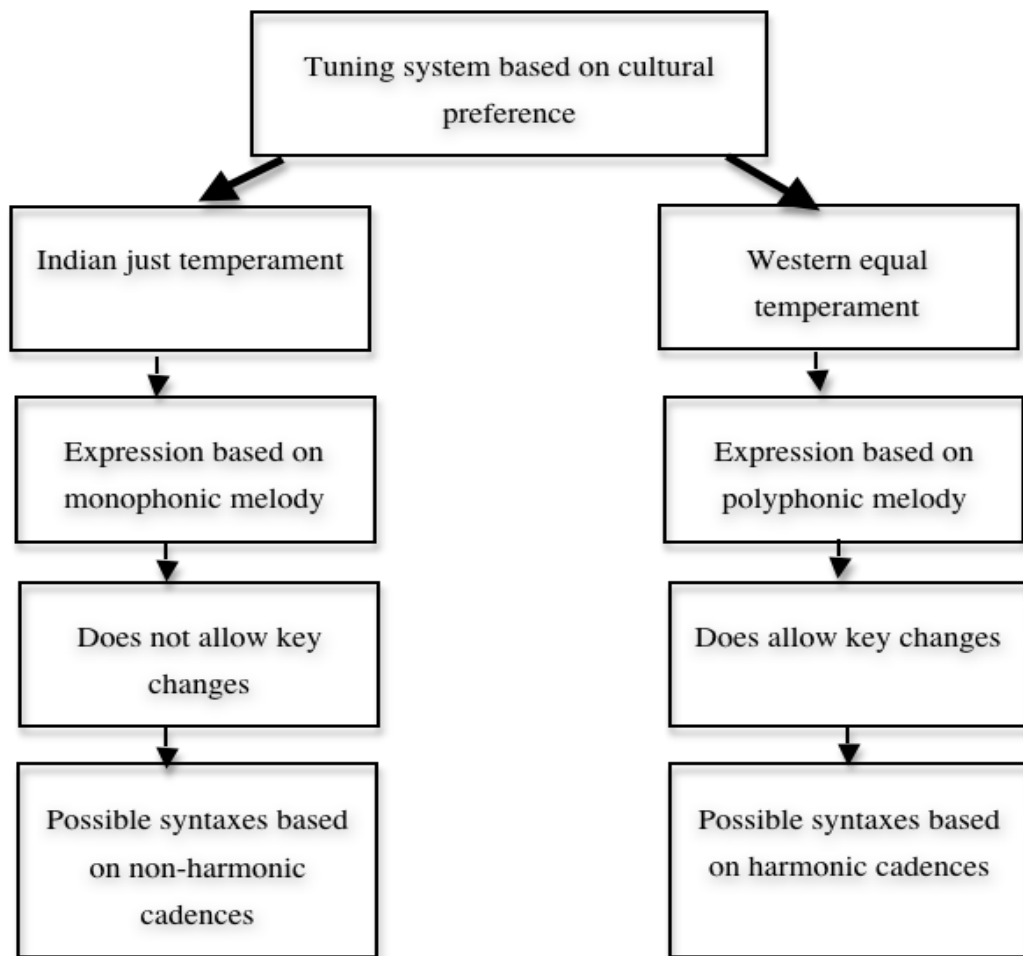
Here the tuning system of Indian music works best with a single melody being performed over a static, vertical drone, and Western music using multiple simultaneous melodies to create a complex and dynamic sequence of vertical, simultaneous interactions. This is an example of how the elements of a codification prescribe the syntax of the expression of that codification.

Western Musical syntax

Western Music is an area of expression that communicates quite profoundly, within that culture, without visual or lexical referents. A primary way in which listeners make sense of a musical offering is through that offering's adherence to known forms and structures. This area of music has a long history of study by many music theorists, teachers, performers and composers (see, for example:Forte 1973; Powers 1976; 1980; Sloboda 1986; Rowe 1993; Patel 1998; Patel, Gibson et al. 1998; Gabrielsson and Lindstrom 2001; Zbikowski 2002; Patel 2003; Patel and Daniele 2003; Zbikowski 2005; Patel 2009) . This discussion ranges through approaches regarding the physical structure of musical sound, music's semantic structure, the relationships between scale tones, pitches, pitch classes and harmonies, and much more.

In western musical traditions there is an expectation that the music should in some sense be circular, in that there should be a beginning point, an excursion from that point and finally a return to that point; this is the A B A', or ternary, form. There are many variations of this form, with additions of sections, repetitions of sections, prescription of tempi and modulation and so on. These variations often have more detailed and prescriptive names; for example the Sonata, which basically follows the AA'BA structure, or the Rondo, which follows the ABACADA, with the additional sections C and D. It is clear that there is a need to return to the origin in each of these, as there is in most versions of structure in Western music.

The song Twinkle Twinkle Little Star is an example of the ABA' form, where we hear a first phrase, the A section, followed by a second phrase, the B section, and finally a repeat of the first phrase or A' section.

Figure 39: Twinkle Twinkle Little Star, First phrase (A section)

Figure 40: Twinkle Twinkle Little Star, second phrase (B section)

When listening to the first two measures of Twinkle Twinkle Little Star the listener makes an assumption based on their familiarity with the melody and an expectation is created in as to what the next pitch will be; if this assumption is met then a sense of satisfaction is achieved. However, if there is a variation from that assumption then the listener may interpret the differences as ranging between being interesting interpretation of the melody, to the melody being performed wrongly. In Figure 41 the first and third notes in measure 3 are lowered but the contour, or direction of the melody is not significantly altered.

Figure 41: Twinkle Twinkle Little Star, first phrase, with a slight variation in measure 3
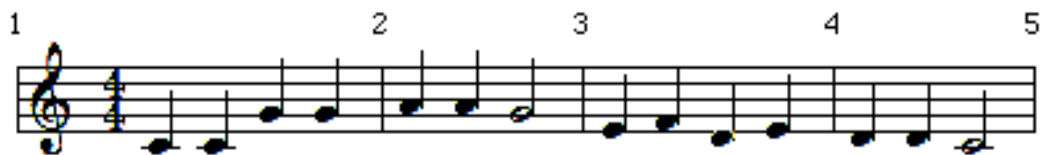
This variation would not disrupt the sense of the music or the understanding that the tune was 'Twinkle Twinkle", as it follows the overall trajectory of the phrase. However, in Figure 42 many pitches in the melody below are significantly different, as is the melodic contour, the main familiarity is that the temporal relationships are as expected.

Figure 42: Twinkle Twinkle Little Star, first phrase, with a large number of variations

This alteration would most likely lead the listener to assume the melody is not Twinkle Twinkle Little Star, or that significant errors are made in the performance of the piece. If the temporal relationships between pitches were altered listeners may assume that the melody is no longer Twinkle Twinkle Little Star, even though the title of the rendition may say it is. In this case the listener usually endeavours to make sense of what they are hearing as music by referencing what they know or understand music to be.

Table 3: Difference in cents between just and equal temperaments

Note	Ratio in just temperament	Difference from tonic in just temperament	Difference from tonic in equal temperament	Difference between just and equal temperament
C (1, tonic)	1/1	0	0	0
G (5th, dominant)	3/2 (1.5)	702	700	+2
F (4th sub-dominant)	4/3 (1.333)	498	500	-2
A (6th)	5/3 (1.666)	884.4	900	-15.6
E (3rd)	5/4 (1.25)	386	400	-14
D# Minor 3rd)	6/5 (1.2)	315.6	300	+15.6
G# (Aug 5th)	8/5 (1.6)	813.7	800	+13.7
A# (Aug 6th)	9/5 (1.8)	1017.6	1000	+17.6
D (2nd)	9/8 (1.125)	204	200	+4
B (7th)	15/8 (1.875)	1088.3	1100	-11.7
C# Minor 2nd)	16/15 (1.066)	111.7	100	+11.7
F# (Tritone)	45/32 (1.406)	590.2	600	-9.8
C	2/1 (2)	1200	1200	0

As can be seen in this, the 5th and 4th have the closest equivalence in both the just and equal temperaments other than the octave, or 1. These are also the relationships to the tonic that are used in both Western and Indian music traditions, albeit for different reasons. In Indian music the 1st and 5th, and occasionally the 4th, (depending on the *rag* being used (Jairazbhoy 1995, p. 65)), supply drone tones that make "*every* type of melody possible" (Lavezzoli 2006, p. 21). In Western music these notes supply the sub-dominant and dominant scale tones and their allied chords, those that lead back through the Western cadential system, to the tonic.

Table 4 shows the unevenness of the intervals between each pitch in the just tempered scale. While there is a rough patterning of intervals it is not as regular as the pattern of the equal tempered scale.

Table 4: Chromatically ordered just intonation chromatic scale showing differences in pitch separation

Note	Ratio in just temperament	Difference in cents from origin in just temperament	Difference in cents from previous pitch
C	1/1	0	0
C#	16/15 (1.066)	111.7	111.7
D	9/8 (1.125)	204	92.3
D#	6/5 (1.2)	315.6	111.6
E	5/4 (1.25)	386	70.4
F	4/3 (1.333)	498	112
F#	45/32 (1.406)	590.2	92.2
G	3/2 (1.5)	702	111.8
G#	8/5 (1.6)	813.7	111.7
A	5/3 (1.666)	884.4	70.4
A#	9/5 (1.8)	1017.6	133.2
B	15/8 (1.875)	1088.3	70.7
C	2/1 (2)	1200	111.7

Table 5 compares the differences between frequencies of notes in the equal temperament tuning and the Just intonation tuning over two octaves from A3, taken as having the frequency of 220 Hz, and A 5 with a frequency of 880 Hz.

Table 5: Comparative frequencies of equal temperament and just intonation from A3 (220 Hz) to A5 (880 Hz) (Irwin 2009, Just Intonation- Explained section)

Pitch	Equal tempered frequency	Just intonation frequency	Frequency difference between Equal and Just tunings
A3	220	220	0
A#/Bb3	233.0819	234.6667	-1.5848
B3	246.9417	247.5	-0.5583
C4	261.6256	264	-2.3744
C#/Db4	277.1826	275	2.1826
D4	293.6648	293.3333	0.3315
D#/Eb4	311.127	314.2857	-3.1587
E4	329.6276	330	-0.3724
F4	349.2282	352	-2.7718
F#/Gb4	369.9944	366.6667	3.3277
G4	391.9954	385	6.9954
G#/Ab4	415.3047	412.5	2.8047
A4	440	440	0
A#/Bb4	466.1638	469.3333	-3.1695
B4	493.8833	495	-1.1167
C5	523.2511	528	-4.7489
C#/Db5	554.3653	550	4.3653
D5	587.3295	586.6667	0.6628
D#/Eb5	622.254	628.5714	-6.3174
E5	659.2551	660	-0.7449
F5	698.4565	704	-5.5435
F#/Gb5	739.9888	733.3333	6.6555
G5	783.9909	770	13.9909
G#/Ab5	830.6094	825	5.094
A5	880	880	0

Abstract art and meaning

There has been much theorized regarding the grammar and arrangement of elements in visual art. The breadth of this study and information indicates a wide variety of views on the subject of syntax in visual art. Curtis Carter's (1976) comparison of syntactic relationships between visual and textual elements, in the process of viewing painting as a language, indicated the problems of this kind of theorizing (p. 114 – 115), and Stebbing's (2003; 2004) discussions on universal and biological grammars for visual composition provide examples of a broader and more pragmatic approach to understanding the structure of visual arts.

The area focused on here is abstract art,

> [a term] applied in its strictest sense to forms of 20th-century Western art that reject representation and have no starting- or finishing-point in nature. As distinct from processes of abstraction from nature or from objects … [with] a conscious aesthetic based on assumptions of self-sufficiency (Moszynska 1990, para. 1).

As a form it developed from Impressionism in the late 1800s through to the non-representational works of Wassily Kandinsky and Piet Mondrian in the 1920s to the abstract expressionism of the1940s, exemplified by artists such as Jackson Pollock, Mark Rothko, and Willem de Kooning. Many other art movements are encased in or allowed by this form of painterly expression, such as Op Art and Minimal Art.

Figure 43: Breakfast, by Juan Gris (1914)

While this image is a somewhat distorted rendition of a table laid out for breakfast, it is possible to see the cutlery and crockery, a newspaper, a package and so on, placed on it. In this case the viewer easily draws a relationship between the image and its title.

While in Gris's painting it is possible to see the image as described in the title it is not so easy to see an image of a fox in Braque's painting shown in Figure 30, below. We do see the word FOX written on the upper right side of the painting, and that could be what Braque referring to. However the word FOX can have a number of interpretations, it could refer to a carnivorous animal, a crafty person, a colour, and so on. The word also exists in French, as in fox-terrier, and can be translated into: *renard* - the carnivorous animal, *maculer* - to stain, *piquer* - to prick, *feindre* - to feign, *ruser* - one who ruses, *mystifier* - to hoax, or *tromper* - to deceive.

Figure 44: Fox, George Braque (1911)
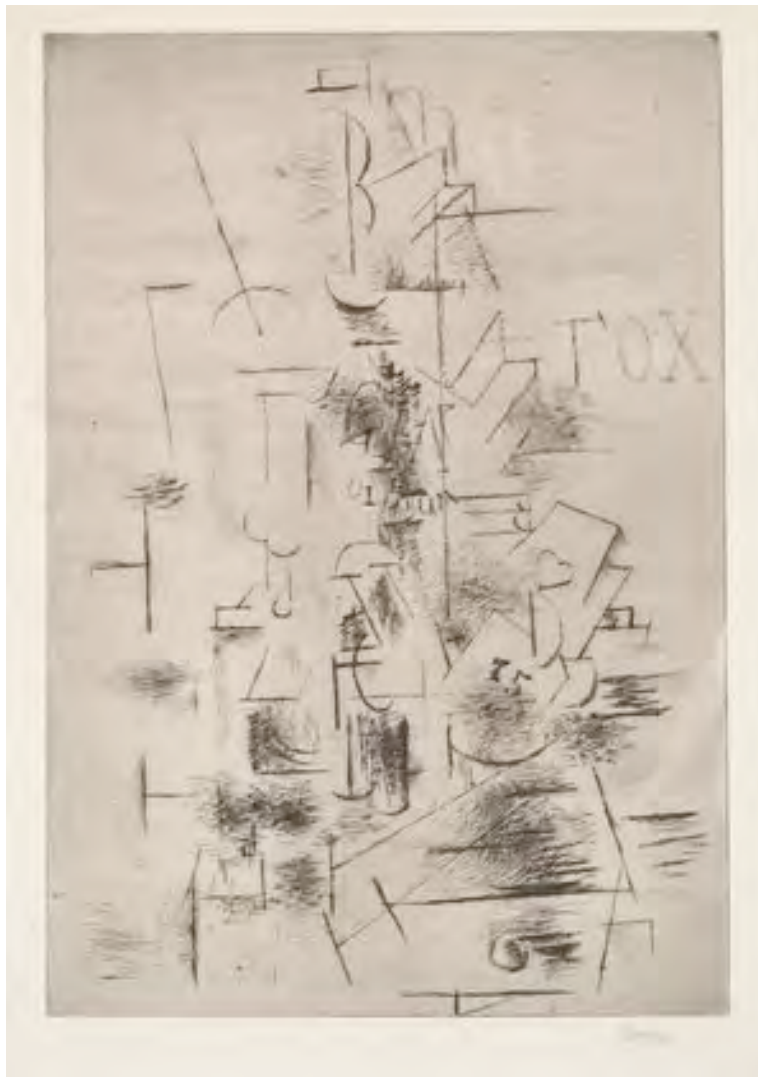
At present there are a number of potential images within the work that may cause me to think I see something that I recognize. These include stairs, a love heart, a keyhole, numbers, and so on, and it is quite possible that in a different frame of mind to the one I am inhabiting as I write this I will see different images within Braque's work.

All information contained within the image other than the word FOX has little relationship to 'fox' as I currently understand the term to mean, but this could be Braque's intention, perhaps he wants the audience to make their own interpretations of the title in regard to the image, and the image in regard to the title, and that this interpretation develop as the audience re-views the work from different standpoints.

Here I am attempting to make immediate sense of the image in relation to information external to the image, that is, its title.

Unlike the confusing, multi-content image by Braques, Rene Magritte's *Le Trahison des Images*, seen in Figure 31 below, presents an unequivocal image with an equally unequivocal accompanying text. In doing so Magritte vigorously subverts the requirement for a direct semantic relationship between image and text.

Clearly this is an image of a pipe, but Magritte states that "this is not a pipe" within the image itself. The immediate relationship that the audience can draw is made through the painting's title, translated as *the Treachery of Images*. This title allows the audience to be part of the making of the artwork, requiring them to see an image, have their understanding of the image denied, and then for that understanding to be reconciled through attention to the title of the work. It also allows a transparent way to make sense of the image and the artist's intentions. The perceiver is allowed in on the joke, and required to embrace the experience of viewing the painting as more than just the act of 'viewing a painting'.

Figure 45: Le Trahison des Images, René Magritte (1928-9)

Piet Mondrian's *Broadway Boogie Woogie*, shown in Figure 46 below, offers an opportunity for idiosyncratic interpretation that draws on memory. My first impression is of the Manhattan street grid and buildings, evoking memories of my experiences there; it has a quite logical use of line and few colours, and is 'pleasing to the eye'. Critic John Russell agrees, saying "All of New York is in this painting, if we know how to look for it." (Neet 1987)

This comment itself requires that the onus be on the viewer to understand the work, placing it in a context local to the place in which the work was created and which allows the idiosyncrasies of that socio/geographical location.

Other interpretations of the work see it as a having a structure based on the Golden Rectangle or other mathematical structures (Hill 1968; Gutierez 2009); that it is a "[classic example] of the congruency between form and design in music and its counterpart in the visual arts" (Donnell and Duignan 1977, p. 76-77).

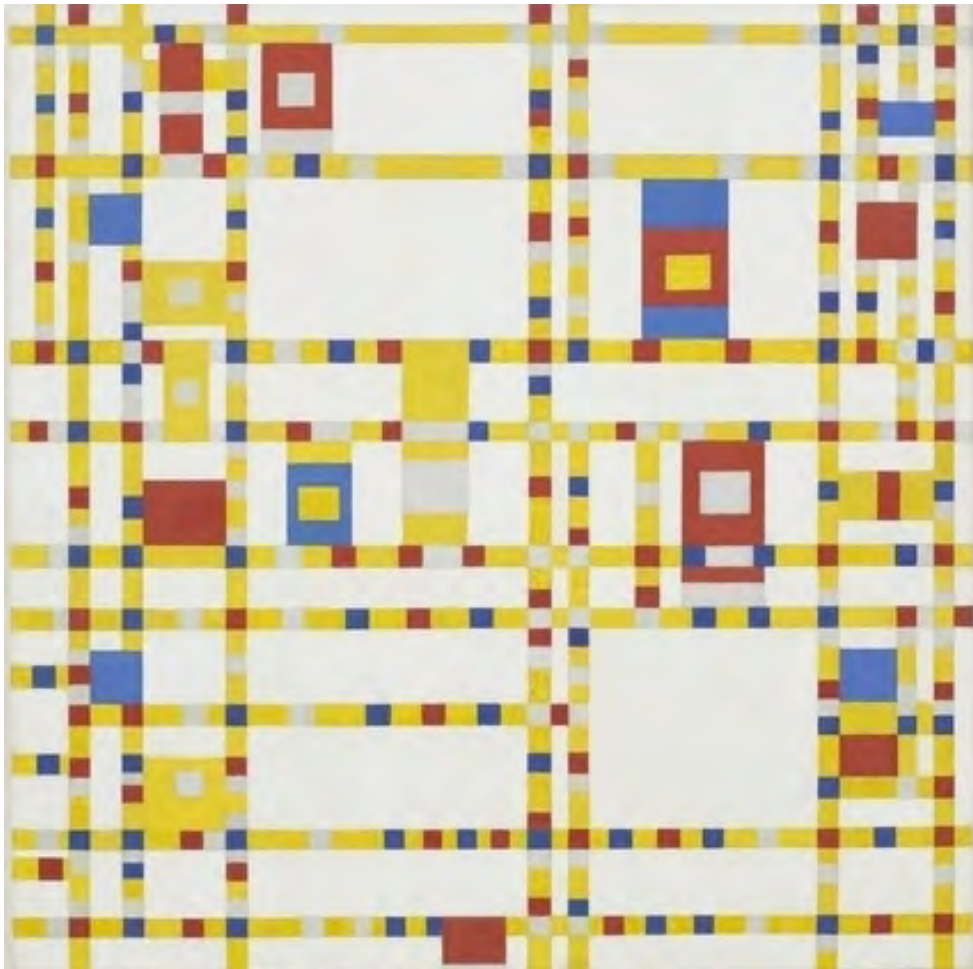Figure 46: Broadway Boogie Woogie, Piet Mondrian (1942-43)

Figure 47: Blue Poles (Number 11, 1952), Jackson Pollock (1952)

This painting can be seen to be what it is described as; blue poles that rise vertically on the canvas. If viewed in that way it may be considered an impressionistic, interpretive painting, one that a viewer might describe as "blue poles". Pollock often gave his paintings numbers rather than names, perhaps indicating that, in this case, the name came after the work, and naming them was possibly a way of allowing the audience to more easily relate to the work. By stating the obvious, as Pollock does here, the author gives the audience a handle with which to view the image.

While not discussing Blue Poles *per se*, mathematician Richard Mansfield (2002, p. 4) gives another interpretation of Pollock's work, claiming "that what Pollock did was to throw away the inessential details of form and space in order to concentrate on the inner core of jagged complexity. [He] was able to discard this baggage [of Western Art History] and paint nature as no-one ... before him had ever done." Mansfield went on to say "I don't see chaos in his paintings, I see the same mathematical structure as the space filling skeletons of living flora." (Mansfield 2002, p. 5)

Interpreting God and Adam

Figure 48: God and Adam, Sistine Chapel (Krén and Marx date unknown)

Vastly differing interpretations of the image of Adam and God abound, and these are often dependent on the interests of the interpreter.

For example: in their paper *Michelangelo and Medicine* doctors Strauss and Marzo-Ortega (2002, para. 5) list a neuroanatomist as seeing "the image surrounding God and the angels had the shape of a human brain"; yet Andrea Tranquilli et al (2007), see it as placenta-like, and Blundell and Srinivasan (1996, p. 14246) see an analogy between the painting and "a pseudosymmetrical (2-fold axis) molecule in which the two topologically equivalent catalytic groups (the two ''hands'' of the molecule) are now in distinctly different environments; one can push, while the other can pull more effectively."

Maria Rzepinska (1994) does not concentrate on the two hands in the fresco, instead focusing on the relationship between the angel (seen to the left of God in Figure 48, and in detail in Figure 49) and Adam, saying "The Creator embraces her with his left arm. … Her face is turned towards Adam with an expression of intense concentration" (Rzepińska 1994, p. 181). Later Rzepinska discusses the angel's position on the left of the Lord's body, "the female and passive side [which] is also associated with evil."

Figure 49: Angel in the crook of God's left arm (Rzepinska 1994)

Chapter 3 Appendix

Ikeda

Images made from digital renderings of *Zero Degrees* are shown in Figure 50: Spectral graph of Zero Radius and Figure 51: Time against amplitude graph of Zero Radius, on page 183.

These images are made with the program Soundtrack Pro (© 2003-2007 Apple Inc.), as are all other sound images in this chapter. Figure 50 shows a spectral image, which displays the amount of sonic activity in specific frequency bandwidths, of the piece. When viewing a spectral image of sound the vertical axis indicates the frequencies heard and the horizontal axis represents time. This kind of image can give a clear indication of the sonic gestures that are heard in the piece.

Here it can be seen that in the first three minutes there is periodic activity in the bandwidth just above 4 kilohertz, which is at the top of the frequency range human hearing is most attuned to, less, but still periodic, activity at just above 8 kilohertz, and a great deal of activity in a bandwidth just above 14 kilohertz[89].

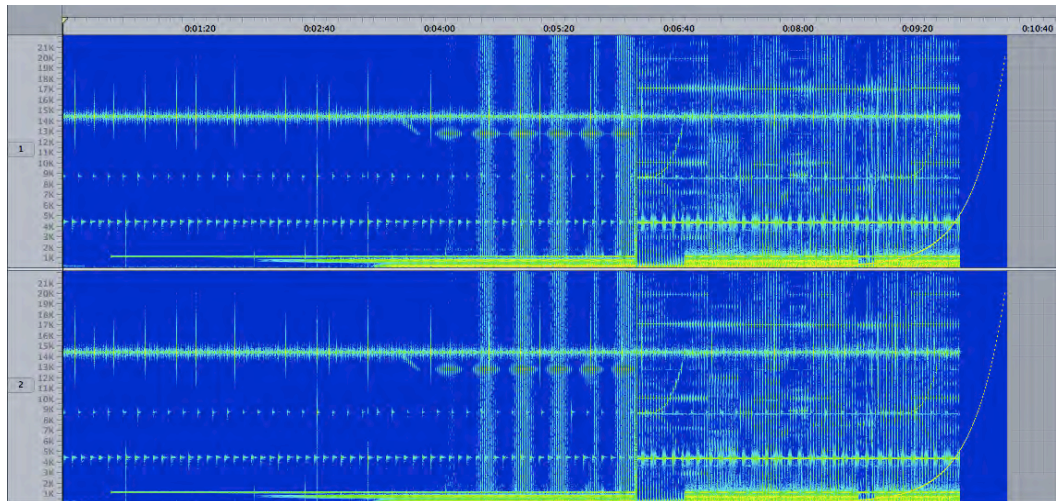Figure 50: Spectral graph of Zero Radius

Figure 51 shows a time against amplitude graph, where the vertical axis represents amplitude and the horizontal axis represents time. Here it can be seen that as the piece progresses there is an increase in amplitude up until about 10 minutes, when there is a sudden drop in sound levels that slowly increases up until the end of the piece. Interestingly, this is when a relatively pure sine tone that increases in frequency at a logarithmic rate is heard. The experience of this sound is that it decreases in amplitude but the sensation of pressure on the ears increases. Finally, at 10 minutes and 24 seconds, the sound seems to disappear. When the piece ends there is still a sensation of sound being heard, similar to the ringing that is experienced after attending a very loud rock concert.

---

[89] For me, a sine wave at 14KhZ at low amplitude is experienced more as a 'thickening of the air' and less as a definable tone; however, as the amplitude increases I hear it more as a tone that results in a definite physical response. For others the effect and experience could be very different.

Figure 51: Time against amplitude graph of Zero Radius
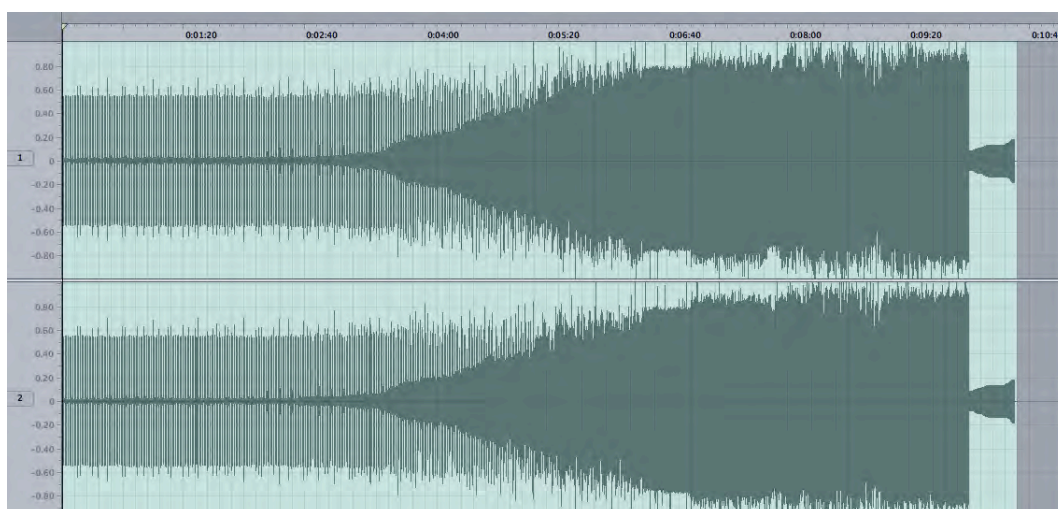
Ikeda is quite prolific in other time-based arts, also collaborating in the creation of installation and video works, all of which represent a similar aesthetic and art making philosophy. There is a sense when experiencing his work that, although there can be great activity, a sense of edgy, uncomfortable stillness pervades. This could be due to the way his work bombards the viewer with rapidly changing images and sounds that swap with times of stillness or little action or variation, and his quite prevalent use of repetition and slow variation.

His audio and video work is seen in the DVD *Formula* (Ikeda 2002). The first section *installations* is of audio works, and the *concert* section is a rendition of his work presented at The Garden Hall, Yebisu, Tokyo, October 14, 2001.

The installation piece *matrix (for acoustic dislocation)*, of which only the sound element is given on the DVD, was presented at The Mind Zone Of The Millennium Dome, London, 2000. It uses very high frequencies that seem in some way based on the natural sounds of electronic devices, such as the types mentioned above. Using such pure sounds at high frequencies and amplitudes does create a sense of acoustic dislocation as they move in the stereophonic space. Often the frequencies heard seem painful and, depending on the degradation of the listener's hearing, seem more a physical experience than an aural one. It becomes very apparent that the listener's location is fundamental to the sound heard and there is often a sense that the experience of the music resides and resonates experientially, not just in memory, after the piece has ended.

The concert section of the DVD Formula is the filmic documentation of the Garden Hall concert listed above. The position of the documenting camera and its relationship to the concert presentation screen and floor in front of that screen is important in the aesthetic of the DVD rendition. Here the film crew, Theater Television Ltd, places the camera at ninety degrees, on axis, to the presentation screen and the reflective stage floor, designed by Takayuki Fujimoto. The result is a horizontal line across the entire width of the DVD presentation screen, where moving images converge and overlap, much as they would at a perspective point: this creates an image that seems simultaneously both two-dimensional and three-dimensional, and also gives a very firm sense of groundedness of the video image for the viewer.

Ikeda connects sounds with images that seem equally as normal and/or as unnatural. He keeps a very tight relationship between the sounds and the movement, points of change, or meeting in Hiromasa Tomari's video, creating a coincidence between the sound and visual elements that gives both equal primacies.

Figure 52 to Figure 55 are images from the DVD rendition of the Garden Hall concert. Figure 52 is a still frame of the cross that moves diagonally from the top left hand corner of the screen to the bottom right corner. As it crosses the centre point a high-pitched ping is heard; this motif repeats, with variations, creating a strong sense in the viewer of the clear connection between the sound and the image; this sense is reinforced as the piece develops.

Figure 53 is an image of numbers. Possibly representing digital data. The image coincides with three pulses of filtered white noise that descend by approximately a 4th interval and then 5th interval, followed by 2 sine wave pulses that ascend by approximately 2 octaves. Prior to this, much smaller number images are shown moving rapidly up the screen in time with a white noise pulse.

At 20'06" we see the image shown in Figure 54 that coincides with an American sounding voice saying what we see. Figure 55 shows images that return to the motif seen in Figure 52, but coinciding with more complex sounds. From about 31'05", we hear sounds that fit more within the traditions of Western electro/dance genres, albeit constructed from synthetic, noise-based sources; this provides a return to music that the listener may be more accustomed to, and conclusion.
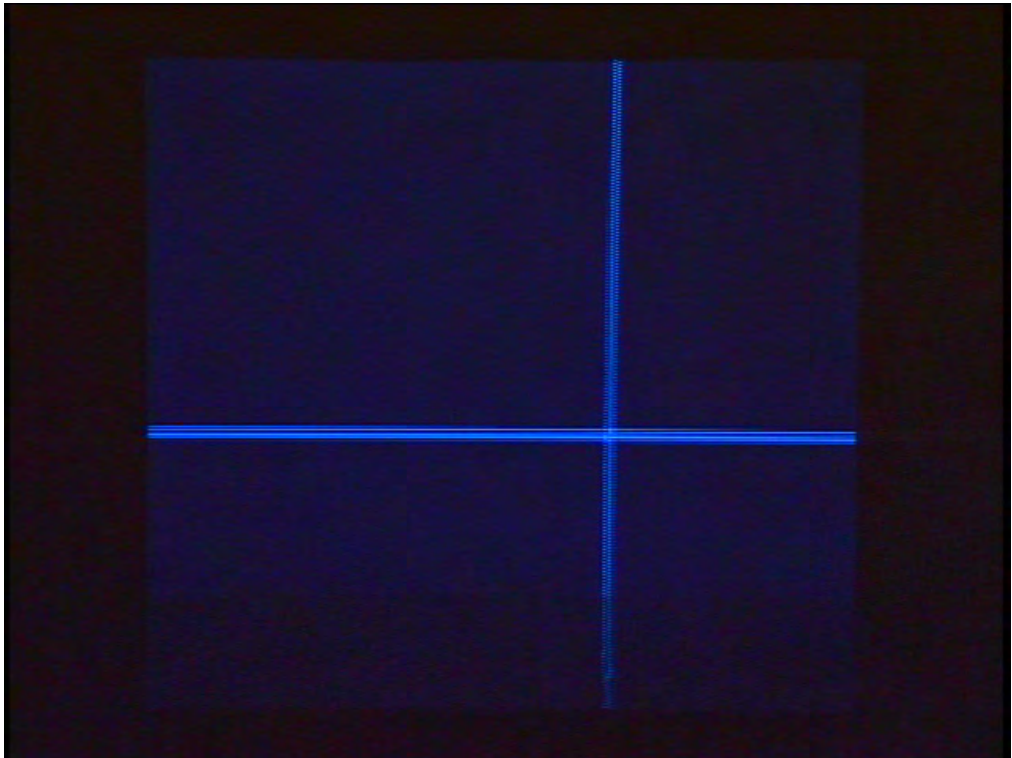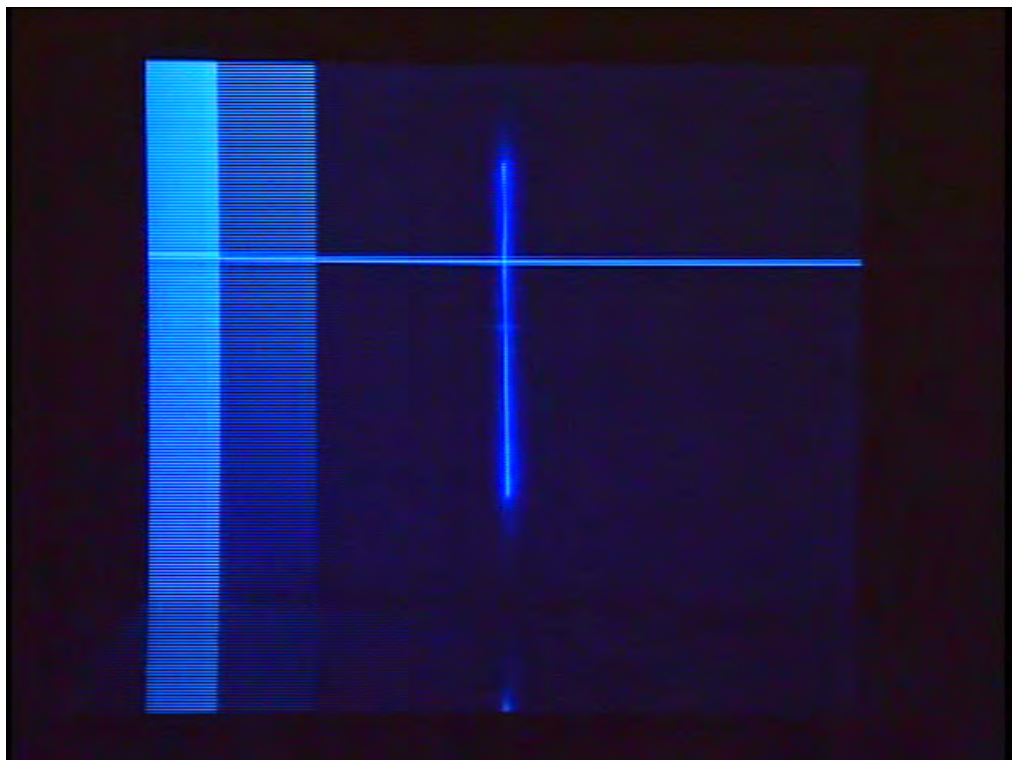
Figure 52: *concert* [image 1]

Figure 53: *concert* [image 2]

Figure 54: *concert* [image 3]

Figure 55: *concert* [image 4]

Nono

This is a comparatively long discussion on one art-object. However, it exemplifies many of the characteristics I am interested in exploring in my practice, and I believe that the environment and systems influential in its creation are worthy of exploration.

Fragmente, Stille, An Diotima

> was "commissioned by the City of Bonn for the 30th Beethoven Festival, composed between July 1979 and January 1980, and first performed on 2 June 1980 … [The music is] an extremely fragile web, which appears open at all sides and repeatedly assumes a state of motionlessness … [creating a] musical language that defies attempts at verbal description, one that is pure sound … to be discovered aurally, literally extracted in the process of hearing. "To awaken the ear, the eye, human thought, intelligence, externalising as fully as possible that which has been internalised – this is what matters today." (Stenzl 1986, CD liner notes)

The

> "premiere was also a kind of *succes de scandale*, not because of its political message but because of the apparent lack of one. [It] confounded all expectations of a composer whose reputation had hitherto been based on works for larger forces which almost always incorporated politically motivated texts and sought to denounce both former and current totalitarian regimes in public." (Nielinger-Vaki 2000, p. 247)

In discussing this piece I will use spectral images, seen in Figure 56 and Figure 58, and time against amplitude images, seen in Figure 57 and Figure 59. These images give a visual representation of the sounds that are heard in the specific performance I am discussing here. Figure 60 shows the scale used by Nono.

Forming Fragmente, Stille, An Diotima

Fragmente has two sections, titled "Beginning" and "Conclusion", each of which have quite similar approaches in that they present sound fragments of fluctuating, pulsing density. Figure 56 to Figure 59 below show how the sounds are separated into small atoms of increasing size and density in "Beginning"; seen as the increase in width and brightness of light blue images from about five minutes in to the end of the section. We also see that the frequencies presented are mostly in the audible range, up to about 6 Kilohertz, with occasional excursions above that range, the highest reaching 20 Kilohertz at around 17'20", very close to the end of the section.

Figure 56: Spectral graph of *Fragmente - Stille an Diotima*, Beginning
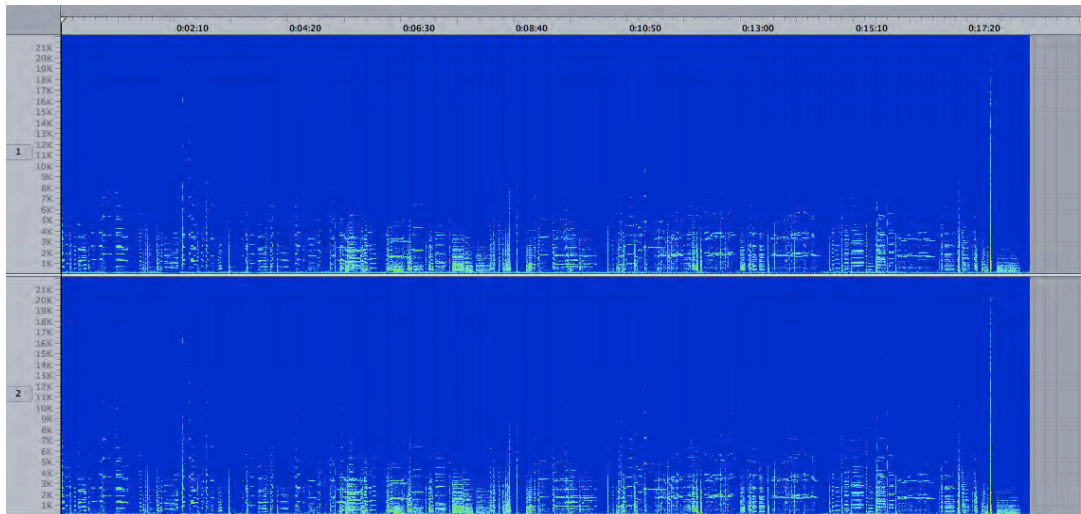

Figure 57: Time against amplitude graph of *Fragmente - Stille: an Diotima*, Beginning

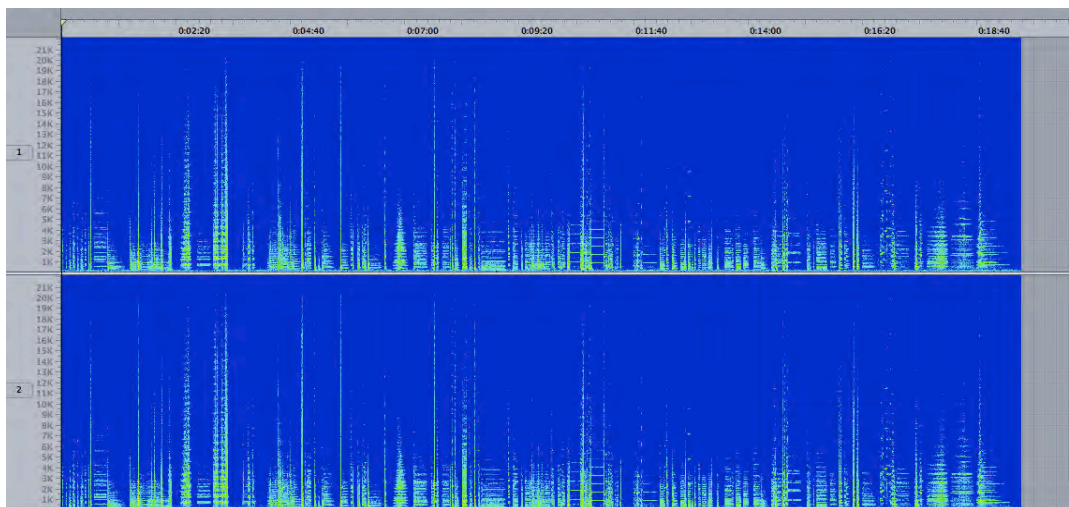Figure 58: Spectral graph of *Fragmente - Stille an Diotima*, Conclusion

Figure 59: Time against amplitude graph of *Fragmente - Stille: an Diotima*, Conclusion

Nono used the enigmatic scale, shown in Figure 60, used by Giuseppe Verdi for his setting of Ave Maria in 1889, which "was composed by Verdi as a mere exercise in counterpoint, stimulated by an invitation published in the Gazzetta Musicale of Milan, that proposed to its readers to compose a harmonization for an enigmatic scale published in the journal." (Nielinger-Vaki 2000, p. 250)

The scale omits the 4th and 5th scale notes of the typical western major scale, and these are the scale notes that, at a quite basic level, provide much of the impetus, or sense of harmonic direction and motion, required by much western music. This means that Nono must provide a sense of motion, in the traditional Western sense, through other means, or the listener must be satisfied by the lack of traditional, musical motion; thankfully, to my mind, he chooses the latter. This is not to imply that there is no apparent logic or impetus in the work, simply that these elements do not fit the typical and easily definable systems of typical western music[90].

---

[90] I am viewing the gamut of western music, from pop to art music and all in between in this comment; western pop music is clearly a style that follows traditions of harmonic rhythm and cadence developed from the C16, and it is with the more recent advent of 'eletronica' and the more adventurous aspects of dance music that these traditions have been extended.

Figure 60: The 'Enigmatic scale' used by Nono in *Fragmente - Stille: an Diotima*, (Neilinger-Vaki 2000, p. 250)

(a) *Scala enigmatica* on C

History

Much of his section is based in Carola Nielinger-Vaki's paper QUIET REVOLUTIONS: HOLDERLIN FRAGMENTS BY LUIGI NONO AND WOLFGANG RIHM

> Between 1964 and 1982 several works by composers who were or had been associated with the Darmstadt New Music Courses formed part of this nationwide fascination with Hölderlin: Bruno Maderna's series of works (1964-9) on Hölderlin's only novel Hyperion; Henri Pousseur's two improvisation studies *Mnemosyne I and II (*1968-9); Heinz Holliger's *Scardanelli-Zyklus* (1978- 91); Wolfgang Rihm's Hölderlin-*Fragmente* (1977); Hans Zender's *Hölderlin lesen* (1979); Luigi Nono's *Fragmente-Stille, An Diotima* (1979-80); and, finally, György Ligeti's *Hölderlin Phantasien* (1982). (Nielinger-Vaki 2000, p. 245) …

Theodore Adorno's lecture,

> 'Parataxis: Zur spaten Lyrik Hölderlins' ('Parataxis: on Hölderlin's Late Poetry'), was cited by Pierre Bertaux as one of the most important texts regarding the function of silence in Hölderlin's work but significantly also drew a parallel with Webern. Adorno's particular interest in Hölderlin as the master of the intermittent gesture is thereby clearly understood in relation to, and possibly even as a consequence of, Darmstadt's fervent and influential Webern reception throughout the 1950s. (Nielinger-Vaki 2000, p. 246)

> The discovery of Webern's use of silence [and the] presence of John Cage in Darmstadt in 1958 also fuelled a strong interest in the various possible ways of composing silence. That composers should have been attracted to Hölderlin's art of leaving things unsaid … is thus unsurprising. … The importance of the inaudible is enhanced in that most of the sound-events themselves explore the subtle range of the barely audible. Differentiation is achieved not by means of sudden contrast but by means of nuance, the result being a web of silence and diverse but quiet sounds." (Nielinger-Vaki 2000, p. 247)

The sense that silence can be a musical, literary, and potentially philosophical tool is quite interesting, as one of the opportunities it offers is for the listener to be as equally active in the creation of the composition as the composer. The moments of silence are filled by the listener's own thoughts, and these may r may not have relationship to, or be inspired by the music; or, at the opposite extreme, have no relationship other than coincidence. In any case, it seems that the purpose of the music is to allow all of these potential outcomes.

David Metzer adds to Nielinger-Vaki's discussion of the piece, saying

> "Softly played chords, fragmentary phrases, and muffled tones, … clusters, the phrases grow more sparse and perishable, tones, now typically produced by extended techniques, sit awkwardly on top of a bubble of sound. … [In turn heightening] evocations of silence. Clusters weave a thicker, eerier quiet; [and] multiphonics barely whisper. …
>
> These means are crucial to [a] conception of silence proposed here. [Webern and Nono] employ [these musical devices] to set an expressive scene that situates silence in a specific role and place. The scene occurs at the border between sound/music and silence. All three composers locate their works in that ephemeral realm. For his part, Cage sought to erase once and for all the line between sound and silence (and, along with it, that between music and sound).(Metzer 2006, p. 334-335)

Figure 61, on page 193 shows the degree of detail Nono used in articulating his vision. "Geheimere Welt" translates as 'more secret world', perhaps indicating the intimacy Nono would like the performers to achieve in the listener, or to inform their performance of the fragment. The first sound Nono puts in the score is a rest, or silence, of just less than two seconds. The dynamic markings, *ppp, pp, p* and *mp*, all indicating comparatively low amplitude levels that require attentive and concentrated listening, and the consequent changes in tonal characteristics and the prevalent use of pauses, also relate directly to the sense that this is a very internal, intimate world that Nono would have us inhabit.

Changes in tempi, and the frequent and rapid changes in methods of playing the instruments, may also cause a sense of hesitancy in the players, and a sense that the desired goal of accurately representing the score is challenging to acquire. The extended techniques Metzer mentions include: playing behind and on the bridge, playing with the wood of the bow, beating the strings on various positions with the wood or bow hair, bouncing the bow on the instrument strings while bowing in the traditional, horizontal manner, and so on. This leads to a variety of sounds that, while clearly of and from a string quartet, are nonetheless unusual when considered within that entire oeuvre.

Figure 61: Score for fragment #1 (Nielinger-Vaki 200, p. 251)

Ex. 2 Nono, *Fragmente-Stille, An Diotima*, fragment #1

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Figure 62, on page 194 lists Nono's Fragments, the text he applies to them, and Hölderlin's original texts; a translation into English follows.

Figure 62: Hölderlin fragments in *Fragmente – Stille, An Diotima* (Nielinger-Vaki 2000, p. 270)

The Hölderlin Fragments of Luigi Nono's *Fragmente-Stille, An Diotima*

The Hölderlin fragments are listed in order of their occurrence in Nono's score. References in brackets are to *Friedrich Hölderlin: Sämtliche Werke*, ed. Friedrich Beissner & Adolf Beck, Stuttgart, 1946–85, and are identified as follows: volume, page(s), line.

Nono Fragment	Text	Poem
#1	...geheimere Welt...	*Götter wandelten einst...* (i/1. 274: 12)
#2	—	
#3	...allein...	*An Diotima* (i/1. 230: 2)
#4	—	
#5	...seliges Angesicht...	*Wohl geh ich täglich* (i/1. 313: 8)
#6	—	
#7	—	
#8	...Wenn aus der Tiefe...	*Der Frühling* (ii/1. 309: 1)
#9	—	
#10	...die seligen Augen...	*Hyperions Schicksalslied* (i/1. 265: 13)
#11	...ins tiefste Herz...	*Diotima* (i/1. 216–19: 77)
#12	—	
#13	—	
#14	...mit deinem Strahle...	*Diotima* (i/1. 216–19: 43)
#15	—	
#16	...Wenn aus der Ferne...	*Wenn aus der Ferne* (ii/1. 262: 1)
#16	...aus dem Aether...	*Der Jüngling an die klugen Ratgeber* (i/1. 225: 20)
#17	—	
#18	...wenn in reicher Stille...	*Diotima* (i/1. 216–19: 81)
#19	...wenn in einem Blick...	*Diotima* (i/1. 216–19: 82)
#19	...und Laut...	*Diotima* (i/1. 216–19: 82)
#20	...wenn in reicher Stille...	*Diotima* (i/1. 216–19: 81)
#21	...tief in deine Wogen...	*Diotima* (i/1. 216–19: 115)
#22	...in stiller ewiger Klarheit...	*Hyperions Schicksalslied* (i/1. 265: 14–15)
#23	...im heimatlichen Meere...	*Der Jüngling an die klugen Ratgeber* (i/1. 225: 8)
#24	...ruht...	*Der Jüngling an die klugen Ratgeber* (i/1. 225: 8)
#25	...hoffend und duldend...	*Götter wandelten einst* (i/1. 274: 16)
#26	...heraus in Luft und Licht...	*Diotima* (i/1. 216–19: 6)
#27	...Denn nie...	*Lebenslauf* (ii/1. 22: 9)
#28	...Wie so anders...	*Diotima* (i/1. 216–19: 9)
#29	—	
#30	...in leiser Lust...	*Diotima* (i/1. 216–19: 29)
#31	...Ich sollte ruhn?...	*Der Jüngling an die klugen Ratgeber* (i/1. 225: 1)
#32	...in's Weite verfliegend...	*An einen Baum* (i/1. 209: 13)
#32	...einsam ... fremd sie, die Athenerin...	*An ihren Genius* (i/1. 243: 4)
#33	...staunend...	*Der Abschied* (ii/1. 26–7: 33)
#33	...Eine Welt ... jeder von euch...	*Die Eichbäume* (i/1. 201: 12)
#34	...das weisst aber du nicht,...	*Wenn aus der Ferne* (ii/1. 262: 51)
#35	...wie gern würd' ich...	*Die Eichbäume* (i/1. 201: 17)

#36	...das weisst aber du nicht...	*Wenn aus der Ferne* (ii/1. 262: 51)
#37	...unter euch wohnen...	*Die Eichbäume* (i/1. 201: 17)
#37	...ihr Herrlichen!...	*Die Eichbäume* (i/1. 201: 4)
#38	...das weisst aber du nicht,...	*Wenn aus der Ferne* (ii/1. 262: 51)
#39	...den Raum...	*Die Eichbäume* (i/1. 201: 10)
#39	...in freiem Bunde...	*Die Eichbäume* (i/1. 201: 13)
#39	...verschwende...	*Emilie vor ihrem Brauttag* (i/1. 277–97: 17)
#40	...leiser...	*Diotima* (i/1. 216–19: 29)
#40	...die Seele...	*Emilie vor ihrem Brauttag* (i/1. 277–97: 18)
#40	...Umsonst!...	*Der Jüngling an die klugen Ratgeber* (i/1. 225: 41)
#40	...an die Lüfte,...	*Emilie vor ihrem Brauttag* (i/1. 277–97: 18)
#40	...Mai...	*Diotima* (i/1. 216–19: 30)
#41	...Schatten stummes Reich...	*Diotima* (i/1. 216–19: 40)
#42	...säuselte...	*Diotima* (i/1. 216–19: 31)
#43	...das weisst aber du nicht,...	*Wenn aus der Ferne* (ii/1. 262: 51)
#44	...Wohl ... andere Pfade...	*Die Aussicht* (ii/1. 312: 1)
#47	...dem Täglichen gehör ich nicht...	*Emilie vor ihrem Brauttag* (i/1. 277–97: 284)
#48	...wenn ich trauernd versank, ... das zweifelnde Haupt...	*Ihre Genesung* (ii/1. 23: 14–15)
#49	...wo hinauf die Freude flieht...	*Diotima* (i/1. 216–19: 58)
#50	...zum Aether hinauf...	*Götter wandelten einst* (i/1. 274: 14)
#50	...im Grunde des Meeres...	(source unknown)
#51	...an ... Neckars friedlichschönen Ufern ... eine stille Freude mir ... wieder...	*Emilie vor ihrem Brauttag* (i/1. 277–97: 168–70)
#52	—	

Table 6: English translation of the text segments used by Nono in the score of *Fragmente - Stille an Diotima*

Fragment	Hölderlin's text, as used by Nono, translated by Ingrid Hornung[91]
1	More secret world
2	
3	Alone
4	
5	Joyful face
6	
7	
8	When out of the deep
9	
10	The joyful eyes
11	Into the deepest heart
12	
13	
14	With your rays
15	
16	When from afar, out of the ether
17	
18	When in rich silence
19	When in one glance, And sound
20	When in rich silence
21	Deep in your wave
22	In still endless clarity
23	In the secret ocean
24	rests
25	With hope and patience

---

[91] Making this translation was difficult as it was done without context, a best fit was considered for each phrase.

Fragment	Hölderlin's text, as used by Nono, translated by Ingrid Hornung[91]
26	Out in air and light
27	Then never
28	As so different
29	
30	In quiet desire
31	I should rest?
32	Fleeing far and wide, lonely … she's foreign, the Athenean
33	Astounded, one world … each of you
34	But you don't know that
35	How much I'd like
36	But you don't know that
37	Live with you, you marvels
38	But you don't know that
39	The room, in free alliance, disappear
40	Quiet, the soul, for free, to the skies, May
41	Shadows of a mute kingdom
42	To sigh
43	But you don't know that
44	Well … other paths
45	
46	
47	I don't belong to the everyday
48	When I sorrowfully sank, … the doubting head
49	Where upon joy flees
50	Up to the ether, at the bottom of the ocean
51	At … the Neckar's peacefully beautiful shores … a still joy for me … again.
52	

Yuskavage's process[92]

As part of her laborious preparation, … Yuskavage makes three-dimensional models of her figures. We are told that Tintoretto made clay figures [so that] he could adjust the lighting and study them from various angles and in relation to the other figures in a composition. [He] probably learned this technique in central Italy from … Michelangelo [who] created small wax figures that he could warm in hot water and mold into the desired poses, … he could reshape and reuse the figurines. Yuskavage makes her maquettes [, using] them to study light: "to get 'real' light," she says. … [Yuskavage uses] photographs [to] get the right distance. She does not want immediacy, only the illusion of immediacy. (Gould 2000, para. 2)

These methods withdraw the artist from the object being represented. By filtering the model through so many media, distance is created. This reduces the sense of intimacy between the artist, model and viewer, often related to other paintings, particularly nudes. The sense of malleability of the human being represented, as if she could be moulded "into the desired poses", opposes this lack of intimacy.

Most of her girls are both "blessed" and "challenged." In addition to their abundant charm and beauty, they must manage with one or another physical flaw: thunder thighs, misshapen breasts, sunken eyes, bad bone structure, general homeliness-- a veritable laundry list of deformities and "shades of plain" interrupt their apotheosis into babedom. (Avgikos 2003, para. 2)

The two images below demonstrate Avgikos's description well; that the women depicted reside on the cusp of apotheosis, yet that they are so withdrawn from the viewer means that this is not a transcendence into 'babedom', but into something else, perhaps a more individual and personal, interior spot.

Perhaps Yuskavage's method of making the art is what causes my confused perceptions, and it is the result of her technique, which highlights Yuskavage's model's/figurine's blessings and challenges, that makes the images interesting.

---

[92] The images 'True Blonde Draped' and 'Interiior: Big Blonde with Beaded Jacket' are accessed from http://www.postmedia.net/01/yuskavage.htm

Figure 63: True Blonde Draped (1999)

Figure 64: Interior: Big Blonde with Beaded Jacket (1997)

Claudia Gould, in her curatorial essay 'Screwing it on straight', discusses the paintings from within her paradigms.

> Looking at Yuskavage's paintings, I am reminded of the way I feel about America when I return home after living abroad. I am overwhelmed by the lush fecundity, the license, the writ too largeness, the abrasive vulgarity. (Gould 2000, para. 1)

Descriptions of the premier performance of *Imaginary Landscape No. 4*

The following tract is taken directly from Charles Hamm's paper <u>Privileging the Moment: Cage, Jung, Synchronicity, Postmodernism</u>

Imaginary Landscape... was not a broadcast of Cage's music played at and transmitted from one, or from twelve, radio stations. Twelve radios were, instead, to be treated like musical instruments and played in concert. How does one turn a radio into a musical instrument? On the stage were the twelve radios, with two players at each, and the composer-conductor-twenty-five people in all. The score calls for one performer to manipulate the dial that selects the various stations desired by the composer to be heard in the course of the work, and another performer for the dial that regulates the dynamics. The composer's directions for tuning the various stations in and out use notes and rests; the wave-length for each station is indicated in kilocycles. Therefore if the piece is played in New York City, one set of stations will be drawn upon; if in Denver, another set of stations, the ones using the same wave-length in that locality, will be heard. The player who regulates the dynamics follows indications in the score that correspond to numbers along the dial from zero up, producing a dynamic range from the barest whisper to a full fortissimo. Like the choice of wave-lengths, the dynamics have definite rhythmic indications. [from Henry Cowell] (Hamm 1997, p. 281)

Cage's preface to the score, which is given below, adds further details concerning the notation and performance of the piece, and the first page of the score is shown in Figure 65.

The numbers above each staff refer to kilocycles. If succeeding numbers are in the same decade, a line connecting them indicates a glissando; if not in the same decade, a line connecting the notes on the staff has the same meaning. Where such lines are not given and a change of tuning is indicated, the change is to be made as abruptly as possible. The numbers below each staff refer to relative amplitude or, to be more accurate, manipulations of the volume control) (3 to 15: 15 being maximum loudness; 1 being turned on but inaudible). Where cresc. or dim. signs are given, changes are to be made gradually; otherwise abruptly. When silence is indicated, turn dial rapidly to 1. A scale to facilitate volume control can be made for each instrument (adhesive tape is a suitable material). Dotted lines below the staff indicate a change to high-frequency overtones. (Hamm 1997, p. 283)

Figure 65: Page One of the Score for *Imaginary Landscape No. 4* (Hamm 1997, p. 282)

FIGURE 1. John Cage, *Imaginary Landscape No. 4 (March No. 2)*

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The following is from David Patterson's interview with Christian Wolff (Patterson and Wolff 2004, p. 67)

> [Patterson] What is your account of the premiere of Imaginary Landscape no. 4 ?
> I've heard several accounts already, all unique.

[Wolff] It's a hard piece to play, because you have these very precise instructions. You have to tune number one to 11.7 and so on. In fact, it was so complicated that there were two people on each radio. Cage hadn't foreseen that one person couldn't do that. I know that the main complaint was that there wasn't enough sound, because it was a very long concert, and some stations had gone off the air, so there wasn't that much going on. But at the time, I didn't think, "Oh, that's too bad, there isn't anything on the air." I thought, "This is beautiful." [laughter] But there was a lot of static, and quiet sounds and occasional voices. I don't remember much music. It was a very austere piece, compared to, say, later performances of things like Variations IV[1963].

[Patterson] It's interesting to hear about that first performance of Imaginary Landscape no. 4, because the perceptions among the individuals who participated in that performance vary so widely; it's almost as though I were asking people about the Theater Piece no. 1 [1952] performance at Black Mountain College. So many people were focussed on such diverse aspects of the performance. One of the performers, Jack Beeson, said that the thing that he remembered most was just the silence, and when it almost got to the point of tedium for him, suddenly someone tuned in to a newscast's tally of the Korean war dead, and Beeson said, "Oh, it was so poignant. I'll never forget that about that performance." He also mentioned that at rehearsal he had asked Cage, "What if we don't get anything on our radio, should we just tune to a station?" And Cage told him no, using the analogy that in Gothic architecture, there are cherubs or whatever that no one but God can see.

Intention

To repeat a quote from Cage regarding the composition of *4'33"*

> I wrote [4"33] note by note, just like the Music of Changes [1951]. That's how I knew how long it was when I added the notes up. It was done like a piece of music, except there were no sounds -- but there were durations. It was dealing these -- shuffling them, on which there were durations, and then dealing them -- and using the Tarot to know how to use them. The card-spread was a complicated one, something big.
>
> [Question: Why did you use the Tarot rather than the I Ching?]
> Probably to balance East with West. I didn't use the [actual] Tarot cards, I was just using those ideas; and I was using the Tarot because it was Western, it was the most well-known chance thing known in the West of that oracular nature (from Fetterman 1996; in Solomon 2002Composition section, para. 45)

The I-Ching, or Book of Changes, an algorithmic tool Cage used extensively in creating his work, is traditionally used to offer alternate approaches to taking action regarding current situations and events. This is in effect a limited random algorithmic system of sixty-four possibilities, each of which has a traditional meaning or interpretation. Algorithmic systems have been used in art making for generations. They usually allow the author to develop ideas based on high-level systems, and art making algorithms fit Cage's use of indeterminancy, which Roger Reynolds defines as "the practice of presuming rules without preferred solutions" (in Cormier 1975, p. 286). Using such a system allows Cage to ask question within his "complicated composing system" and to see the results, or answers to those questions, be provided by his system.

In much of his early work Cage actually did the required processing of arithmetic with this system 'by hand'. However, in later works he employed computer-based systems. Andrew Culver developed programs that Cage used in the composition of his music, and in his textual mesostics (Culver 2009). The programs *ic* [93] and *tic* were specifically designed to use in generating I-Ching oriented musical works. Culver also created *meso*, and *mesorule,* and John Rosenberg created *mesolist* and *mesomake*, for generating mesostics, which form a large part of Cage's textual art works (Culver 2009).

While Cage saw his work as being "an exploration of non-intention" it is obvious that there were clear and firm intentions behind his process. This can be seen in his steadfast use indeterminate processes in the creation of much of his work. Perhaps this "exploration of non-intention" could be better described as Cage exploring the removal of his personal intentions regarding the surface of his art, which would be subject to his personal and immediate and localized taste. He in fact created situations or models and caused or allowed them to develop within those structures, where in effect the structure creates its own surface content, which is not determined by him.

Cage's process may instead have looked to a potentially higher cause when creating his works, ceding control to some other thing through the algorithm of the I-Ching, perhaps an 'indefinable benign universal awareness' that was in fact influencing the fall of the I-Ching. In this way his process was indeterminate and perhaps reflects an element existent in all times, the seeming indeterminancy of all events. But what Cage did was consequently create a set of paradigms that then influenced his times.

By using the I-Ching, and Tarot, which have long histories and cultural significance, Cage imbued his working process with an authority greater than his own, and this authority flows into the works themselves. While it is impossible to specify what that authority is or why the maker and the perceiver recognize it, it is undeniably present, and it is this presence that creates the appreciation within the perceiver that makes the work an art work.

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[93] This program can be accessed at http://www.anarchicharmony.org/IChing/ic.cfm

Interaction, time and space

Cage sees an inherent interaction between events that can be described in the statement 'when two things happen together they are connected'. A traditional understanding of art works, or any other sequence of events, is that is should be understandable. Cage has formed a privileged place for himself, and his process and its results; now, because a work is made by Cage it is viewed through the lens he has created, and that is that a work need not fit understood expectations. Others have used this lens in the creation and viewing of their own works, allowing a freedom perhaps caused by Cage's interest in Zen and the resulting questioning of linearity (Gena 1992)

Without a need for linearity in choice, form, logic, and meaning there is no requirement that, for example, the beginning come before the end, or that there be differentiation between constructed and unconstructed relationships. This notion creates a requirement that the temporal works of Cage and Cunningham (the music and movement), and the non-temporal work of Rauschenberg (the image) be apprehended with attention to the immediate moment, that that moment be captured, as Henri Cartier-Bresson captured moments, and that the immediacy of the moment be the focus of the viewer.

Michelle Potter (1993) gives a comprehensive history of Cunningham and Rauschenberg's, saying that "the accepted hallmark of Cunningham collaborations has always been the notion that each of the elements in the collaboration exists independently of the others". Cunningham has stated:

> What we have done in our work is to bring together three separate elements in time and space, the music, the dance and the decor, allowing each one to remain independent. The three arts don't come from a single idea which the dance demonstrates, the music supports and the decor illustrates, but rather they are three separate elements each central to itself. (in Potter 1993, p. 3)

Carolyn Brown, who danced with Cunningham company between 1953 and 1972, says "the dancers … "discover" the set in dress rehearsal, or to be more accurate, in the final rehearsal, since we rarely had true dress rehearsals. Usually we would hear the music and feel the lighting in the first performance." (in Potter 1993, p. 4) Blending these three elements at this time in the performance-making process means that the performer's discovery of the complete work is similar to that of the viewer: the performers learn how to interact with and understand the work at the same time as the viewer.

As dance informs and interprets space through a temporal process dancers consider themselves in a space in order to do that effectively, and variations in the space require the dancers to reinterpret the choreography in order to effectively use the given space. These reinterpretations may be subtle, and deliberate or unconscious, much as the way a singer or actor adjusts their vocal physiology in order to re-inform a text appropriately for its physical, social and cultural environment, and for the intent that text should transmit.

This process of individual development of the parts negates the usual hierarchy in place for the creation of the movement, visual, and sonic elements of a performance work. Typically the choreographer will create a work around which the music and décor elements respond.

In 1965, John Cage, David Tudor, and Merce Cunningham collaborated on *Variations V*, a multimedia work in which dancers triggered sounds each time they were positioned between one of a dozen photoelectric cells and a light activated each cell. (Chaudron 2009) This revolutionary work challenged notions of the traditional relationship between choreographer and composer—a relationship characterized by compromise of one artist in order to fit the work of the other. (Morales-Manzanares, Morales et al. 2001)

By equal privileging of all elements, to the point where the dancers themselves controlled the flow of Cage's sounds, signifies the depth of mutual control allowed.

Chapter 4 Appendix

The Holocaust and the Differend

Lyotard discussed the *differend* as being a place in which dispute occurs, it is the "case where the plaintiff is divested of the means to argue and becomes for that reason a victim" (1988, p. 9). It is a situation in which a 'wrong' is done, yet that 'wrong' cannot be argued or addressed through litigation[94] as the plaintiff is unable to argue their position because the idiom for arguing is not acknowledged by those to whom the arguments is being made.[95]

Here, it is the very acknowledging that there is a point of irreconcilable separation that allows the possibility of reconciliation. Lyotard considered the event and consequences of the Holocaust as a strong platform through which to frame his argument, and this position was followed in many other discussions of his idea, For example, when discussing the identity of Israel through the lens of Lyotard's approach, Ariella Atzmon saw that the

> concept of 'the Differend' aims to illustrate precisely the logic of dominance of the hegemonic which ignores the 'lack of the other'. The 'Differend' stresses the idea of language as a limitation of reality. While the Differend signals silence, a litigation is the possibility to settle an argument by using phrases from a common rule. When conflicts are signalled as litigations, differences are ignored and transgressed. (Atzmon 1997, The Concept of the Differend section, para. 1)

Example of similar terms for phrase regimens in dance and text

Table 7, using the "phrase regimens" listed in Lyotard's *Thesis*, indicates a possible way of making these linkages. While the terms for the regimens are identical, the understanding and expression of each is significantly different, as is the information contained or implied in them. However, it is the term itself that offers the fulcrum.

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[94] Lyotard defines a *litigation* as "a *litigation* would be the case of conflict … that [can] be equitably resolved [through] a rule of judgement applicable to both arguments."

[95] This is a very simplified encapsulation of the *differend*; in Lyotard's book he offers a very wide variety of alternative propositions and examples of the concept.

Table 7: Examples of Lyotard's heterogeneous regimens, as offered in his *Thesis*, considered in the contexts of dance and text.

Dance regimens	Text regimens
Reasoning: through positing events based on past events (the motions of the dancer in the act of dancing)	**Reasoning**: through positing concepts based on accepted concepts (the accepted meanings of the words used)
Knowing: through interpretation of the past events	**Knowing**: through interpretation of the past concepts
Describing: through the external transmission of signs shown to the perceiver by the dancer	**Describing**: through the perceiver's internal interpretation of signs denoted or connoted by the author
Recounting: from within the event and regimen	**Recounting**; from within this and many regimens
Questioning: through rearticulating previous signs	**Questioning**: through readdressing known concepts
Showing: through the dancer externalizing a sequence of events	**Showing**: through the reader internalizing a sequence of concepts
Ordering: according to physical capacity	**Ordering**: according to an agreed syntax/system

Just as dance is ineffable in the language of text, text is ineffable in the language of dance[96]; however there are points of meeting when viewed through these terms. Here they are taken experientially, for example: finding reason within a dance is based on the viewer making assumptions about the acceptability of current events (movements) and predicting future events based on previous events existing both prior to and external to the performance being viewed. Within a text, reasoning is based on predicting future concepts based on concepts previously presented within the work in relation to concepts existing prior to and external to the work.

---

[96] It is possible to mime a verb or noun through actions, but this form of movement is often seen when playing charades, and is not considered as fitting the genre 'dance'.

This process allows the possibility of an abstracted approach to the creation and perception of a work. With this in mind **Showing**, **Questioning**, or any other of Lyotard's suggested regimens are similar in either, or by extension any, art form. For example: if the term **Showing** is stripped of the contextual processes inherent in the particular regimen, then it becomes a term available to any regimen. These contexts, and the inherent processes form the 'noise' in which the attempt to communicate the intention resides.

Chapter 5 Appendix

Kansei art

The work of Shimaoka Tatsuzo demonstrates the use of *Kansei* in the creation of what may be called 'functional art'. The objects shown below, a jar and a plate, are essentially functional objects, their roots being a transportation vessel and a surface for eating off. It is the addition of *Kansei* that gives these specific objects authority and elevates them to being art works when compared to other jars and plates. The elements that contribute to this elevation are impossible to describe textually, just as the elements that elevate Pollock's work above that of a child dripping paint on a page, or Cage's *4'33″* above that of waiting for a concert to start, are equally ineffable[97].

Figure 66: Tatsuzo Shimaoka, Jar with Lugs (date unknown)

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97 Of course there are many other factors that combine to place Pollock's work above that of the child dripping paint, not least that he has claimed a position similar to Cage's, where the fact that he has made the work prescribes a viewer's perception of it.

Figure 67: Tatsuzo Shimaoka: Plate (date unknown)

What these essentially prosaic objects contain is the ability to engage the viewer. One is required to interpret them as more than simply plates or jugs; they clearly have the direct and deliberate intervention of a practiced artist, and that intervention is also unique to that artist and to the specific work.

While *Kansei* as discussed above is oriented towards visual representations, and the idea that there is a separation between visual and textual thought, the ideas and approaches contained in it transfer to all forms of making. The poietic process, particularly of the 'artist', is often opaque and shrouded in mystery, both for the creator, and for the perceiver, particularly when there is an attempt to describe it verbally. *Kansei* tries to acknowledge the elements that make up the poietic act, and points to developing systems that may facilitate and potentially relieve that shroud for the creator.

Kansei, ceremony and transition

Ceremony and ritual are essential parts of art making. As a dancer puts on a costume and warms up, a painter mixes paints or stretches canvas, or an orchestra tunes they are going through a highly organized and well understood sequence that help attune themselves to the actions they are about to engage in. These rituals may be so practiced and seemingly normal that the ritual its self seems to lose all relationship to more recognized and formalized rituals, however they are still essential for entering the 'creative space'. Many theoreticians and practitioners see the need for creating a separation between the daily and pragmatic self and the creative artistic self as essential to the creative process and a consequent creative result.

> In the tea ceremony, the human being is treated as having kinesthetic, tactile, auditory and thermal as well as visual aspects and the development of which [is] encouraged by his or her environment. The fundamental intention of the tea ceremony is in enjoying the fullness of becoming one in body and mind through a series of physical movements, … , to cultivate the natural ability to exercise one's own sensate body. …
>
> [The] tea ceremony is … one of the disciplines to induce self-awakening, … intended for direct participation in the process rather than the actual effect of tea drinking, the tea house is designed for giving prominence to the passage and sequence, as is the processional path of torii gates in Shinto shrine. Through the procession participants have opportunities to awaken their senses (Ko 2003, Tea-house section).

This understanding of the human as being inherently physical, and that enjoyment can be found in the unity of body and mind, and that awareness of this is paramount seems essential to the experience of Kansei; it is also vital to the enjoyment of performing and performance, both for the performer and their viewer. The *torii* gates referred to by Ko can be found as entrances to Shinto shrines in Japan, where they form part of the cleansing ritual required to enter a Shinto shrine. They do this by requiring that the worshiper concentrate on entering the shrine, focusing their mind from mundane thoughts to their processes of travel into the shrine, and by drawing the mind to this it eventually admits to more spiritual aspects.

Kansei may reintroduce the ritual to the objects, by elevating the object, be it a plate, jug or arch, to requiring some kind of reverence when using or apprehending it.

"*Kansei* means and *Kansei* result precede and follow *Kansei*, and influence each other" and Teiyu Amano [translated Kant's] expression "Sinnlichkeit (cognito sensitiva)" [as Kansei. Like] *Kansei*, the term Sinnlichkeit does not have a proper and direct translation in English. [Simon] Schutte, being a German citizen, explains it as "the perception based on senses in contrast to the abstract perception of the mind without sensory input" … Therefore, Sinnlichkeit is a human ability to receive an image (of an artifact or of a situation) that cannot be grasped by reason. In Kant philosophy, Sinnlichkeit is one of the fundamental processes when a human being interferes with the real world. Only from the sensitive experience, involving Sinnlichkeit, can be output any affirmation of the palpable (or tangible) reality." (Lévy, Lee et al. 2007, p. 10)

Figure 68: *Torii* at the entrance to the tomb of Emperor Hirohito

Su and Restrepo attempted to develop mathematical systems for

an approach to mathematically represent a product's *Kansei* based on the frequency signature (harmonics) of a shape [that would] allow the automatic indexing and retrieval of images from a repository of design precedents [by] determining the relation between images, *Kansei* words and the frequency signatures of those images. (2008, p. 44)

Kansei effort

The commitment required to perceive Tadao Ando's '*Chapel on Mt Rokko'* is greater than that of *A Box of Smile*. Ko described the process of accessing the experience of the chapel:

it is not easy to gain entrance into this church with its unique corridor style gateway with independent construction. To enter the church, one must descend the steep stairs in the back of the tourist hotel back door just above the church then turn 90 degrees at the end of the stairs then make another 180 degrees turn before a 45 degrees turn for a straight walkway to the entrance corridor. As you walk along a long open corridor with semitransparent glass arch ceiling, one must turn 90 degrees in order to actually go into the gate of the church at the end of the corridor and final 90 degrees turn must be made to view the church altar. (Ko 2003, 5.3 section)

He then quotes Ando as saying,

Although I did not consciously emulate it, these frames may remind one of the hundreds of *torri* gates lined up in serpent-like procession along the hillside at the ancient *Fushimi Inari* Shrine in *Kyoto*. These gates lead the people to the shrine, the object of worship, and also function as an important transition between the sacred and profane spaces. (Ko 2003, 5.3 section)

The difficulty of this "important transition between the sacred and profane spaces" this process forces a specific commitment from the perceiver in order to gain access to the experience residing within the chapel. The process forms a 'rite of passage' that must be negotiated in order to achieve the desired outcome, a focused attention on the spiritual and sacred.

It can be anticipated that as the perceiver interacts more with the process of entering the chapel the transformational effect of this process may diminish.

This requirement for a change of focus is reflected in the design of the Interpretation interface, where the perceived degree of difficulty causes an increased degree of commitment by the perceiver in order to achieve their anticipated result.

Often this requirement and process of having to put effort into developing a relationship to any art-object can be seen as subverting the gaze from the object itself and therefore reducing the impact of the work. However, to create a metaphor from Ko's description, it is also possible that through the process of 'descending the stairs, turning 90 degrees, 180 degrees, and 45 degrees', a different, potentially more intimately personal, experience may be gathered and internalized due to those reasons.

Notation

Phonemic speech notation

Table 8: A list of fifty one phonemic symbols that allow the pronunciation of most English words and account for the English accent (Wells 2009)

Consonants	Vowels
p pen, copy, happen	ɪ kit, bid, hymn, minute
b back, baby, job	e dress, bed, head, many
t tea, tight, button	æ trap, bad
d day, ladder, odd	ɒ lot, odd, wash
k key, clock, school	ʌ strut, mud, love, blood
g get, giggle, ghost	ʊ foot, good, put
tʃ church, match, nature	iː leece, sea, machine
dʒ judge, age, soldier	eɪ face, day, break
f fat, coffee, rough, photo	aɪ price, high, try
v view, heavy, move	ɔɪ choice, boy
θ thing, author, path	uː goose, two, blue, group
ð this, other, smooth	əʊ goat, show, no
s soon, cease, sister	aʊ mouth, now
z zero, music, roses, buzz	ɪə near, here, weary
ʃ ship, sure, national	eə square. fair, various
ʒ pleasure, vision	ɑː start, father
h hot, whole, ahead	ɔː thought, law, north, war
m more, hammer, sum	ʊə poor, jury, cure
n nice, know, funny, sun	ɜː nurse, stir, learn, refer
ŋ ring, anger, thanks, sung	ə about, common, standard
l light, valley, feel	I happy, radiate. glorious
r right, wrong, sorry, arrange	U thank you, influence, situation
j yet, use, beauty, few	n̩ suddenly, cotton

w wet, one, when, queen	l̩ middle, metal
ʔ (glottal stop) department, football	ˈ (stress mark)

Examples of image notation

The following three images are from (Segmation 2008)

Figure 69: Demonstration of 'Paint by Numbers' process

Figure 70: Colour palette available for the image in Figure 69.
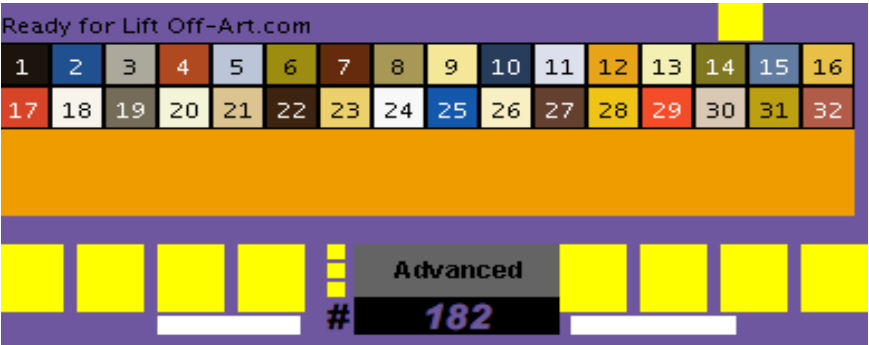
Figure 71: Result of following filing in irregular shapes shown in Figure 69.
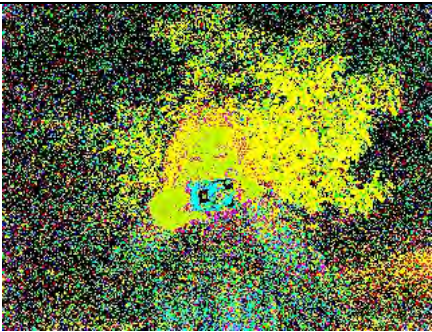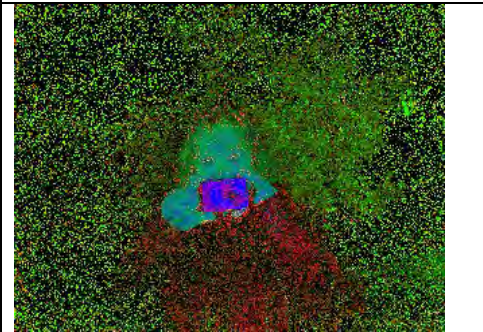
Figure 72, below shows the "approximate wavelength (in vacuum) and frequency ranges for the various Colours" (USByte.com 2002)

Figure 72: The wavelength distance and frequency of photon displacement in perceivable Colours

Color	Wavelength (nm)	Frequency (THz)
Red	780 - 622	384 - 482
Orange	622 - 597	482 - 503
Yellow	597 - 577	503 - 520
Green	577 - 492	520 - 610
Blue	492 - 455	610 - 659
Violet	455 - 390	659 - 769

Table 9, below shows the effect of different computer-based colour systems on the same image.

Table 9: Effect of different Colour systems on an image

Image 5 a: RGB to RGB (Red Green Blue to Red Green Blue)	Image 5 b: RGB to CMY (Red Green Blue to Cyan Magenta Yellow)
Image 5 c: RGB to KCMY (Red Green Blue to Key (black) Cyan Magenta Yellow)	Image 5 d: RGB to HSV (Red Green Blue to Hue, Saturation, Value)

Examples of dance notation

Laban notation

Figure 73 shows Laban notations of the *Fouette-en-Tournant*[98], where the dancer "is initially standing facing downstage left on a bent left leg, the [right] leg extended in front. The right leg is swung to the side and then brought in rapidly as the figure rise on point, and then pirouettes" (Herbison-Evans 2003, Dance Notation section). Figure 75 and Figure 76 show the Laban notation of various arm movements. Figure 77 shows Benesh notation for the same movement

Figure 73: Example of Laban notation of the *Fouette-en-Tournant*
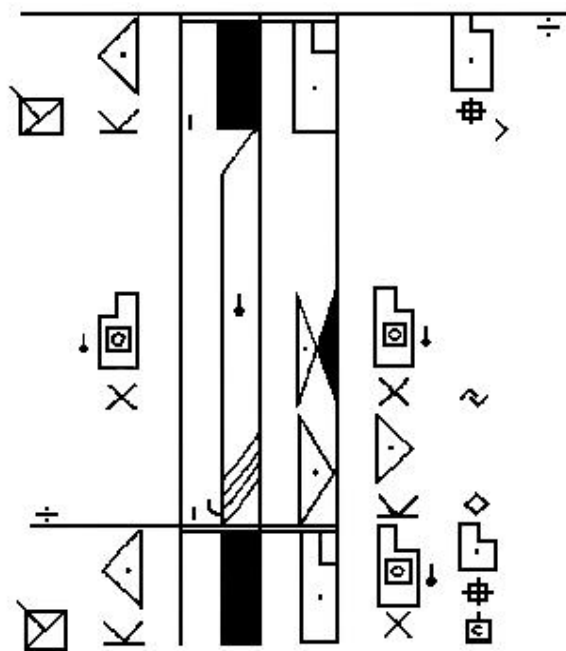
Here Laban notation uses the vertical axis to indicate time, from the bottom up, and Benesh notation uses the horizontal axis, from left to right.

The Laban quadricosahedron, where "the primary division of space is into 27 directions: high, centre, low; forward, centre, back; and left, centre, right." (Herbison-Evans 2010)

Figure 74: The 27 directions in three dimensional space, at the corners (and centre) of a quadricosahedron (Herbison-Evans 2010)
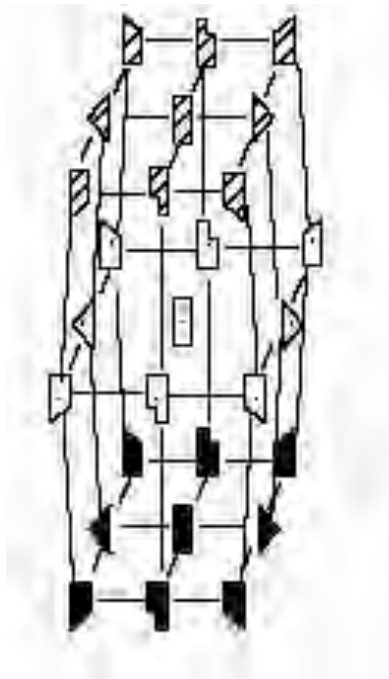
Figure 75 and Figure 76 are sourced from (Griesbeck 1996, Arm and leg section)

Figure 75: Laban notation with accompanying image of the related movement
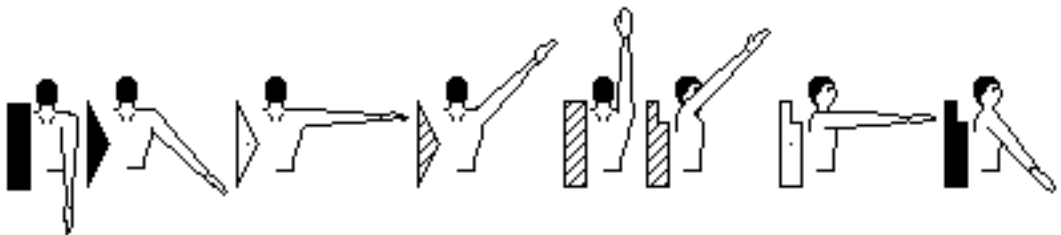
Figure 76: Laban notation with accompanying image of the related movement
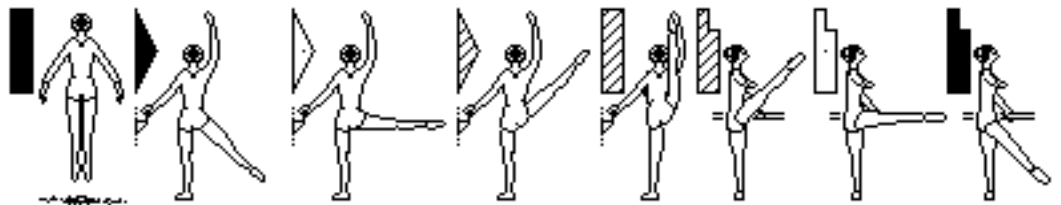
Benesh notation

"Benesh uses notional orthogonal projection of the figure onto a frame on a music-like stave. Each frame is embellished with signs representing detail about positions and movements of the various parts of the body. The frames may be viewed as a series of snapshots of the figure in time." (Herbison-Evans 2003, Dance Notation section, para. 3)

Figure 77: Benesh notation of the *Fouette-en-Tournant*
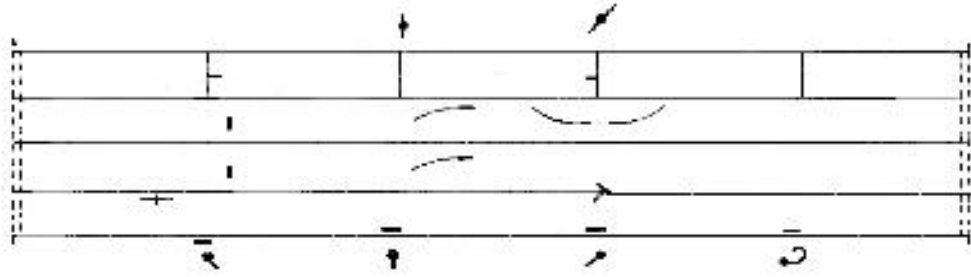
Figure 78: Benesh notation with accompanying dancer image (Royal Academy of Dance 2011, para. 2)
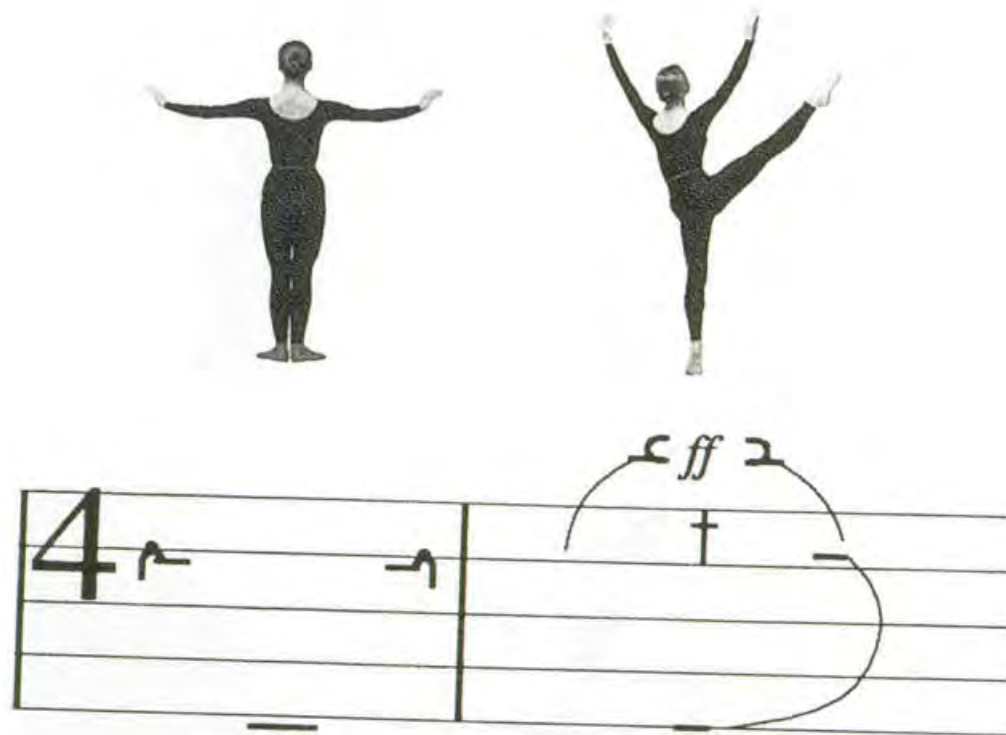
Figure 79: Benesh Stave (Ryman, Baldev Singh et al. 1984, p. 1)
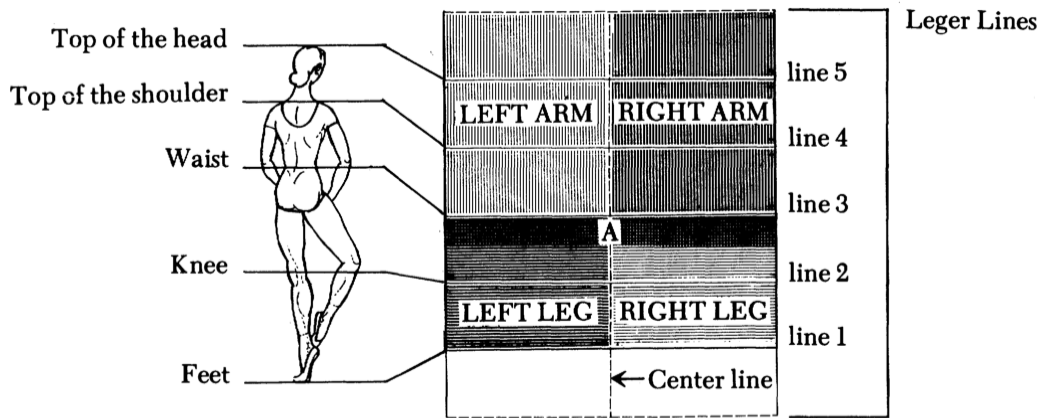
Figure 1. The Benesh Stave
The shaded areas show the domains of the body limbs. Region A
shows the overlap between the top and bottom limb domains.

Examples of musical notation

Figure 80: Example of early musical notation (Blood 2011, Pitch, Temperament & Timbre section)

The four examples seen below in Figure 81 to Figure 83, page 223 demonstrate some of the sonic complexities that may be represented in this notation, first six possible frequencies and three possible durations are represented; then four sets of two simultaneous frequencies, and two durations; then six simultaneous frequencies and four durations; and finally nine frequencies, and six durations.

Figure 81: 4 possible frequencies, and 2 possible durations
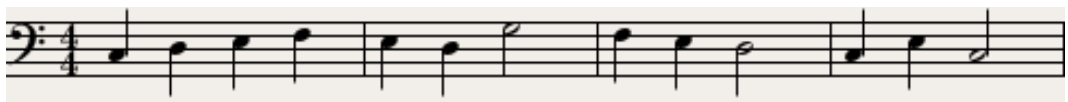
Figure 82: 2 and 3 simultaneous frequencies, and 2 possible durations
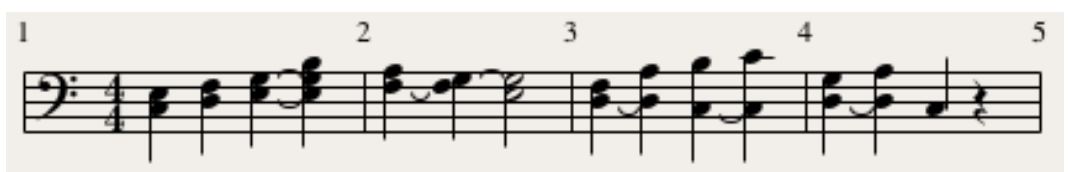
Figure 83: Multiple frequencies and durations

These examples do not represent what is heard, were the scores played by pianos, flutes or vibraphones, the sound would be significantly different, and if different tempi and dynamics were used the affect would be significantly changed.

Examples of graphic scores

The score or *Odysee (ballet)* shown in Figure 84 may be difficult to follow without specific instructions regarding how to interpret it. It in fact requires no less than nine musicians, divided into three groups, and playing instrument of their own choice. This process differs greatly from the traditional score, which allows the experienced score reader to have a clear understanding of the frequencies, timbres, durations and so on of the sounds the composer wishes their audience to experience.

However, while there are no clear denotative symbols used, like those of traditional western music notation, Logothetis's score does give a clear sense of the varying densities of sound and sonic activity that may be experienced. The way this is interpreted, and the underlying propensities that may inform this can be seen in the way in which the images 'taketa' and 'naluma' shown in Figure 33, on page 155.

Figure 84: Anestis Logothetis score for *Odysee (ballet)*, indicating a 'path' (Evarrts 1968, p. 409)

Earle Brown's score, shown in Figure 85 below, implies much less density of sound than Logthetis's. Here there is an implication that he sounds will be brief, individualistic and of varying amplitude, and there is a strong sense that lines lower in score refer to lower frequencies than those higher up the page.

Figure 85: Earle Brown score resembling a Mondrian, (Evarts 1968, p. 411)
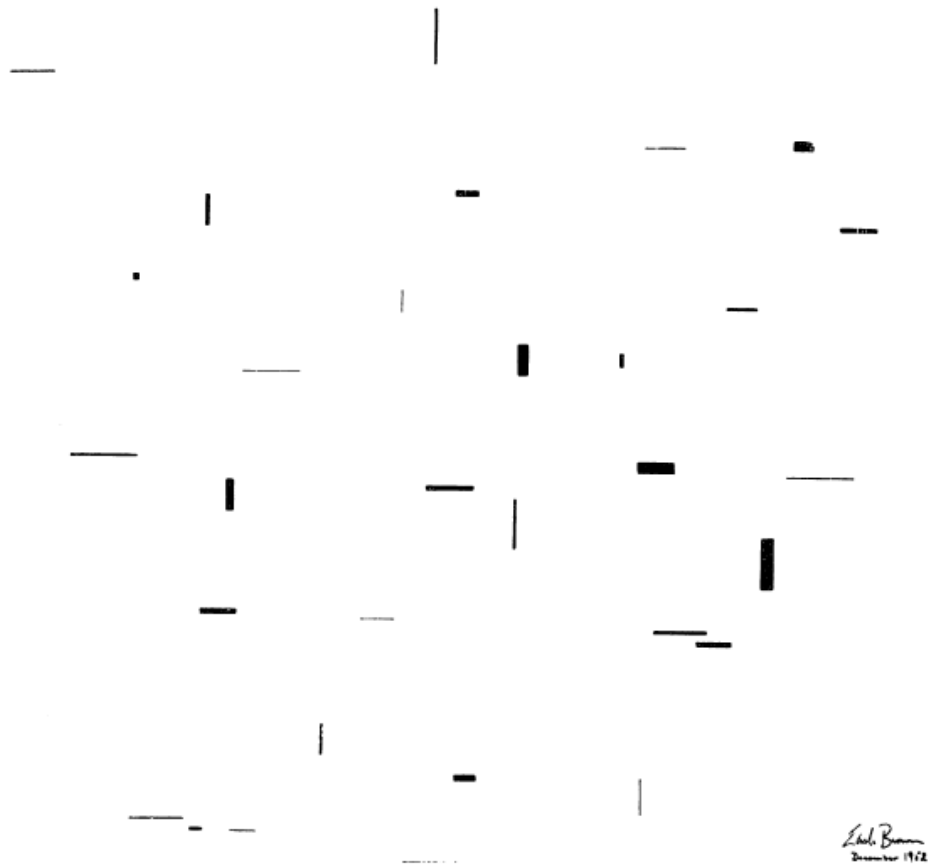
Examples of arithmetic processes in developing melodic variation

Table 10: Arithmetic operators on Western musical pitches

Arithmentic process	Explanation
Transposition (+) value **0** C4 60 C4 60	Here we can see the note C4, middle C, or MIDI note 60 on the left staff. The transposition value currently given to that note is 0. A transposition value of 0 means that we add 0 to the note number we are transposing; therefore, we see middle C on the right staff.
Transposition (+) value **7** C4 60 G4 67	Here we see the same middle C on the left staff but on the right staff we see the note G4, or MIDI note 67. The interval between C and G is usually called a 5th, signifying that G is 5 notes above C. The transposition value of 7 refers to 7 chromatic notes above C, that is C#, D, D#, E, F, F# and finally G.
Multiplication (*) **11** Modulo (%) **24** Transposition (+) **60** C4 60 C5 72	Here we see the same note C4 on the left staff and a C5 on the right staff. This could be seen as adding the transposition value of 12 to the original note. However, the actual process has been to multiply the original note number, in this case 60 by 11, resulting in the note number 660. To find the modulo result we divide 660 by the modulo number, in this case 24, resulting in 27.5. If we consider only whole numbers, this means that 660 divided by 24 results in 27 with 12 left over. If we then add the transposition value of 60 to 12 we get 72, which translates to MIDI note 72, or C5

Arithmentic process	Explanation
Multiplication (*) **11** Modulo (%) **24** Transposition (+) **60** B4 C#5 71 73	Here the difference between the two pitches is only one tone, or a transposition value of + 2. However, this difference was arrived at through an identical process to that shown above. The pitch on the left staff, B4 or note 71 is multiplied by 11 giving 781 which is divided by 24 giving 32.5416, or 32 with 13 left over. 13 plus 60 equals 73, which translates to note C#5

Examples of sonic notation

Figure 86: 10 seconds of an audio signal at 44100 HZs sample rate and 16-bit amplitude range
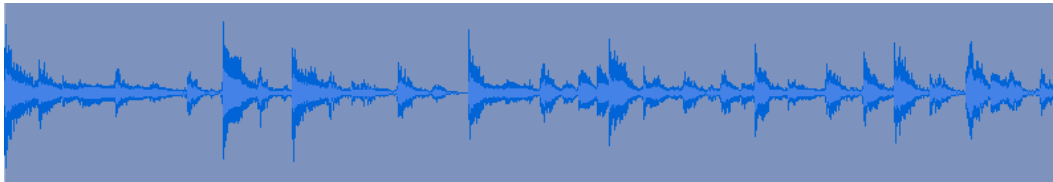
Figure 87: 1 second of an audio signal at 44100 HZs sample rate and 16-bit amplitude range
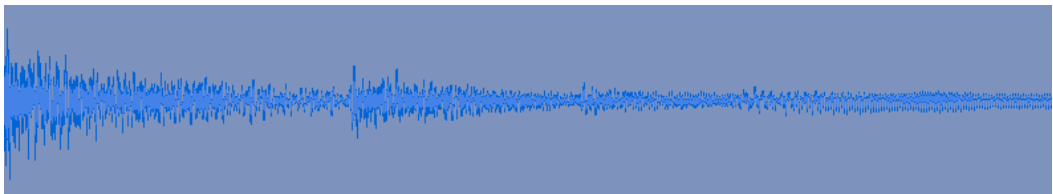
Figure 88: 0.1 seconds of an audio signal at 44100 HZs sample rate and 16-bit amplitude range
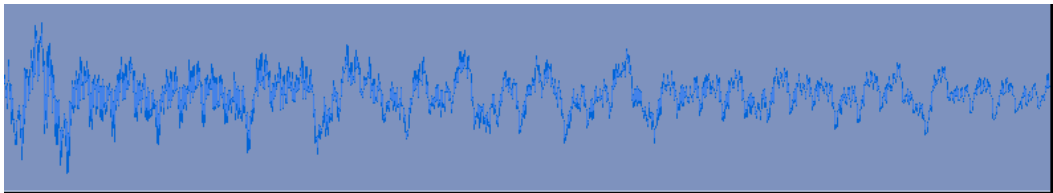
Figure 89: 0.01 seconds of an audio signal at 44100 HZs sample rate and 16-bit amplitude range
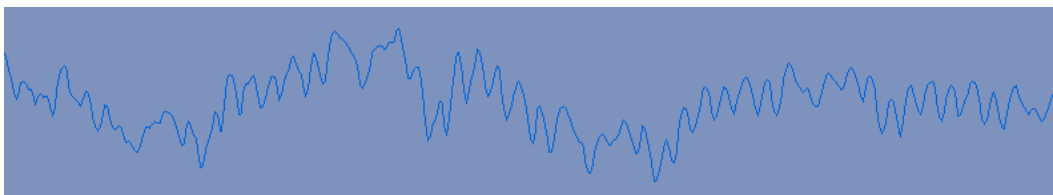
Figure 90: 0.001 seconds of an audio signal at 44100 HZs sample rate and 16-bit amplitude range
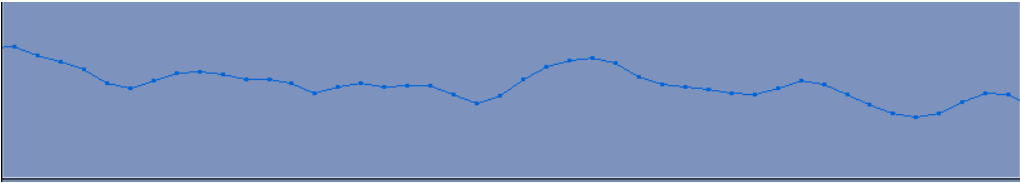
Figure 91: Other images of a sound
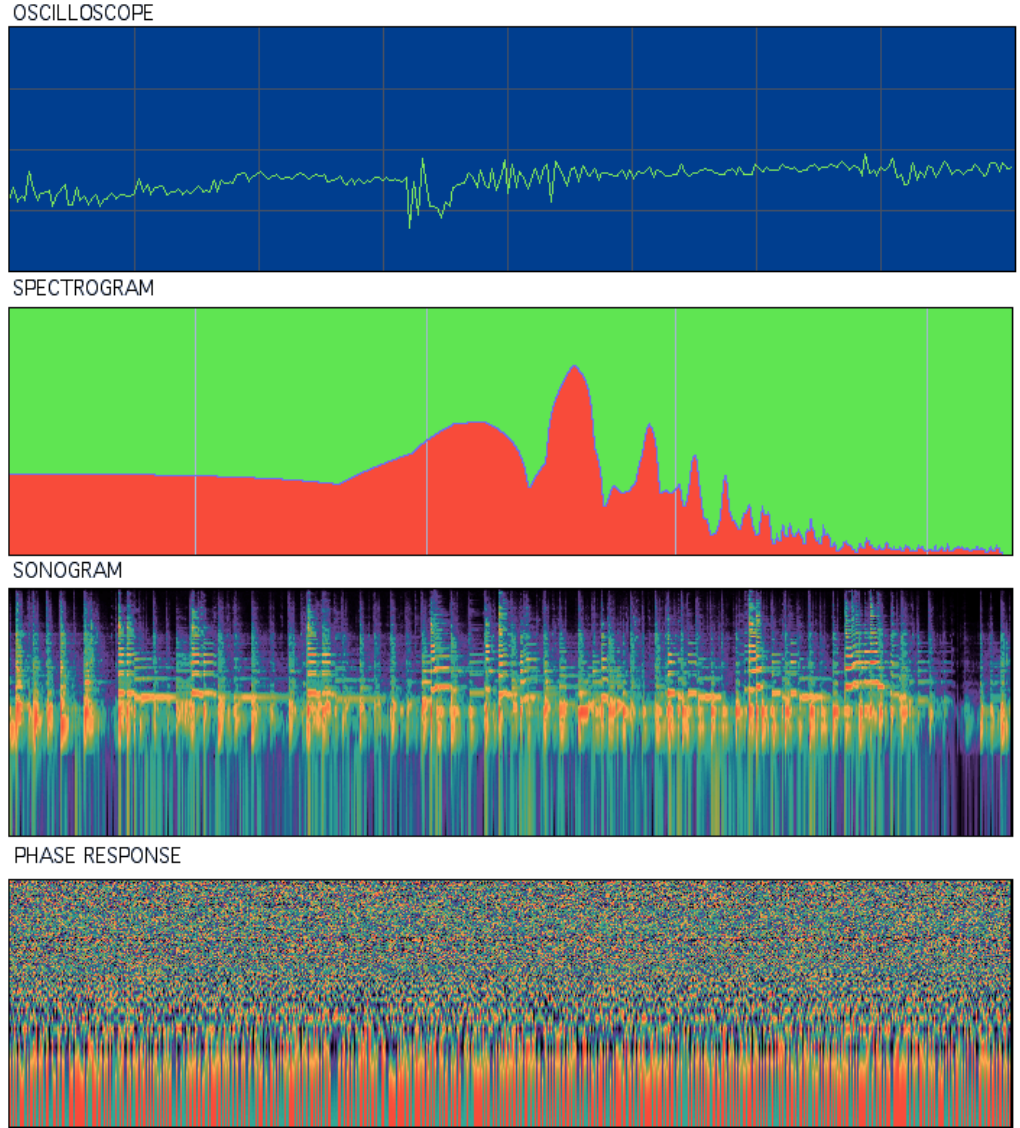
Chapter 6 Appendix

Examples of software interfaces

Software interfaces used in the arts, or related industries, are often quite difficult to rapidly comprehend intuitively. This is due primarily to two factors: first, a there is a comprehensive implied knowledge assumed by the interface designer(s); and second, the effects resulting from any changes will be auditioned. Though this process end users develop a sense of the potential effect of their interactions, and gain a sense of what they can do with the software that has far greater personal, individual potency.

Examples can be found in audio software plugins that influence audio output. The following images show a variety of audio software plugin interfaces that offer differing indicators of the outcomes available through using them.

Figure 92: Abbey Road RS132 plugin (Abbey Road Studios 2011)

Figure 92 shows an interface designed for the cognoscenti. The image assumes knowledge of the Abbey Road Studio's equipment and a desire to embrace the 'authenticity' of the interface. But the interface gives no clue as to the audible effect of any user-made changes to it; for example, the effect of changing from + 6 and + 10 can not be known until it ids heard. This is an example of the end-user being required to audition the effect of their interactions after they have made them.

The same can be said for the interface shown in Figure 93, in which the audible outcome of the software is hinted to in the interface but not defined. The same can be said for those shown in Figure 94 and Figure 95. However there is a slightly clearer indication of the potential effect given through the labels applied to each variable control.

Figure 93: Bitter Sweet 11 (Flux 2011)

Figure 94: Maserati Acoustic (Waves 2011)

Figure 95: Buff Rice (Sonic Birth 2007)

Figure 96 shows an alternate interface for BitterSweet 11. Here the controls are more clearly described and it is possible to see a numeric value for any interactions, however it is still difficult to know what is, for example, "morphed" or what the speed mode refers to.

Figure 96: Bitter Sweet alternate interface

This kind of slider-based interface is shown in Figure 97, but it remains difficult to predict the outcomes of any alterations to the parameters shown in the interface.

Figure 97: Slider based plugin interface (Mda 2005)
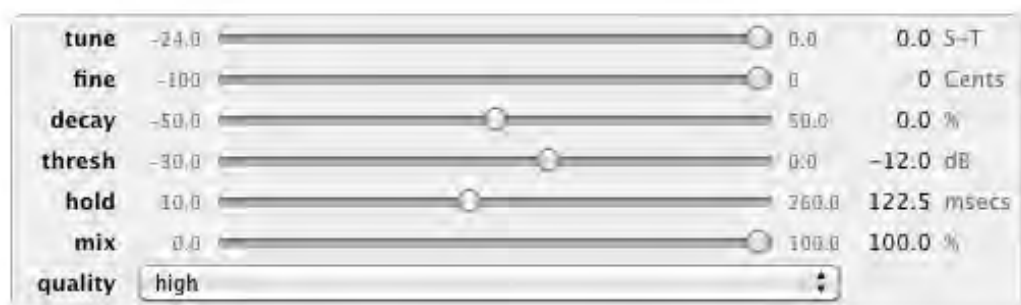
Chapter 7 Appendix

The torus shape with different dimensions

Figure 98: A 4 dimensional torus viewed from one side
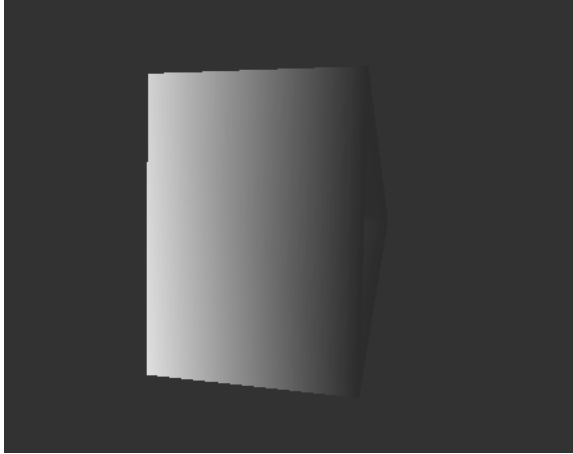
Figure 99: 4 dimensional torus from a changed virtual viewer position
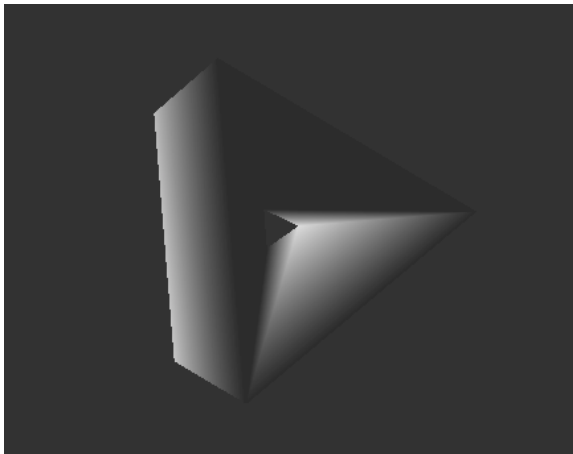
Figure 100: The same 4 dimensional torus as in Figure 99 drawn as a grid
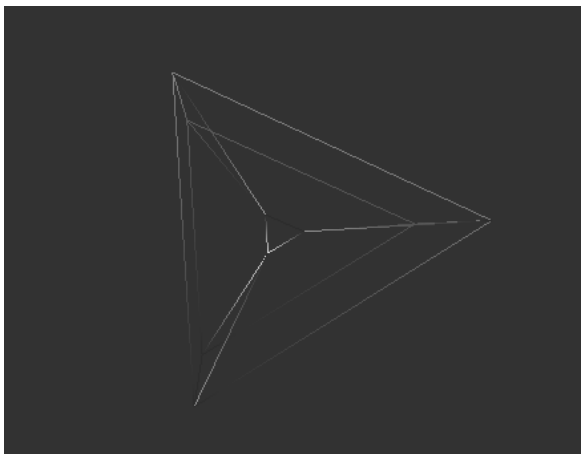
Figure 101: 60 dimensional torus drawn as a grid and viewed from the same position as in Figure 98
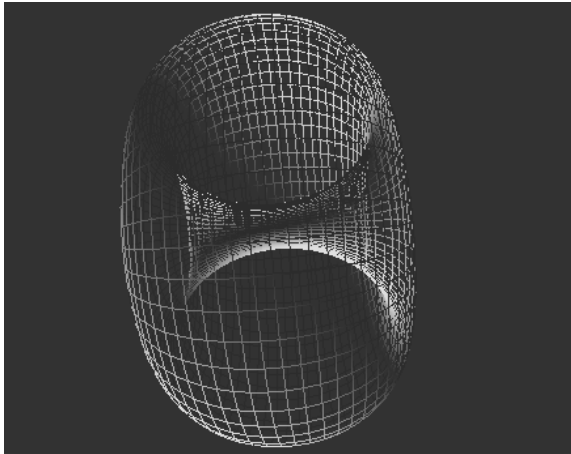
Figure 102: 60 dimensional torus drawn as a grid from the same position as Figure 100
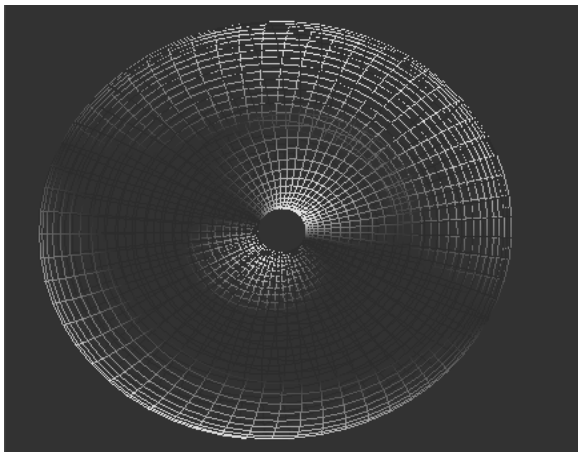
Torus shape drawn in each of the eleven drawing modes available in Jitter; in each of these shapes there are 60 dimensions, the lighting has been enabled and from the viewer's perspective, and the shape is turned slightly to the right in order to create an illusion of depth

Figure 103: Torus drawn as points
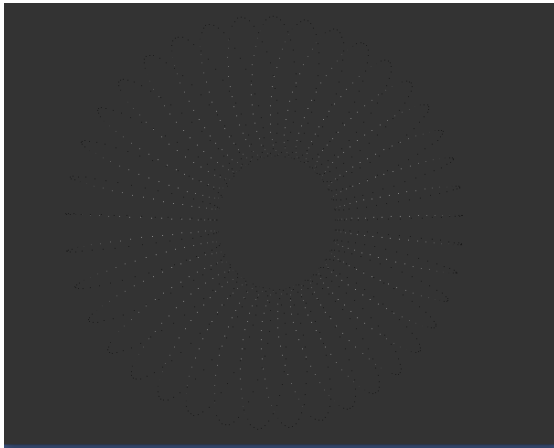
Figure 104: Torus drawn as lines
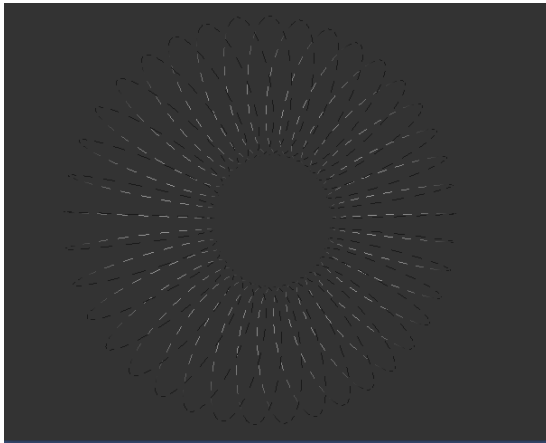
Figure 105: Torus drawn as line strips
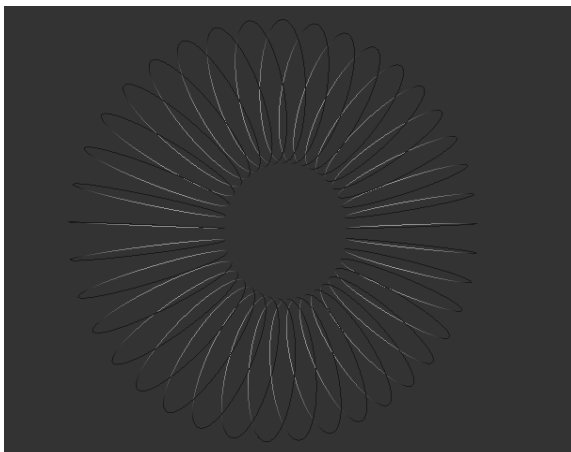
Figure 106: Torus drawn as line loops
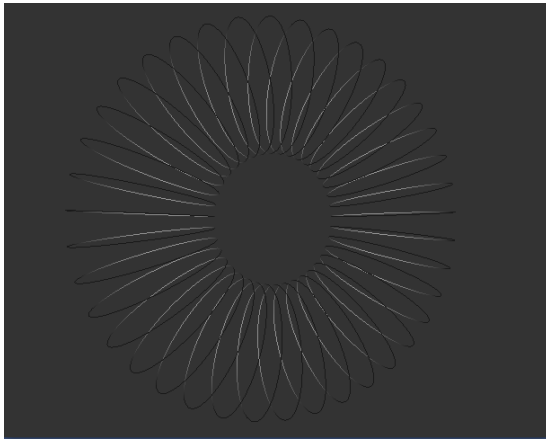
Figure 107: Torus drawn as triangles
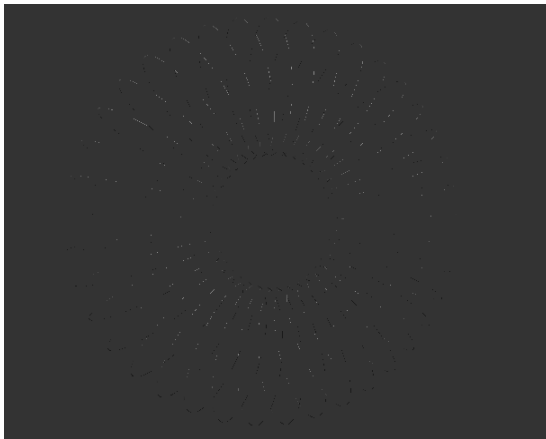
Figure 108: Torus drawn as tri_strips
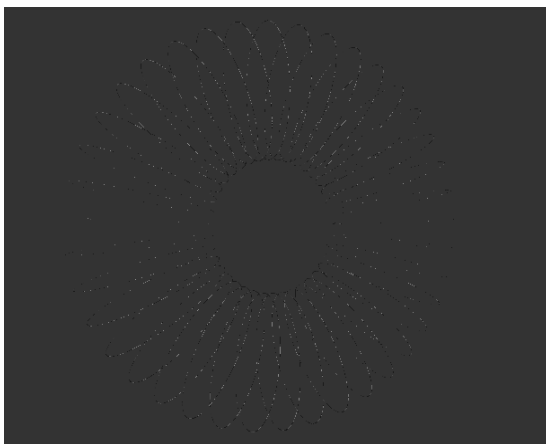
Figure 109: Torus drawn as tri_fans
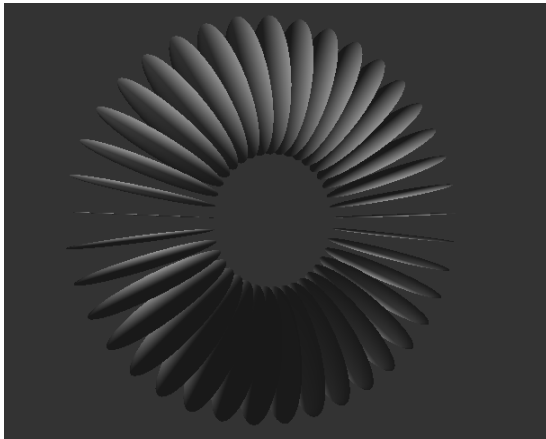
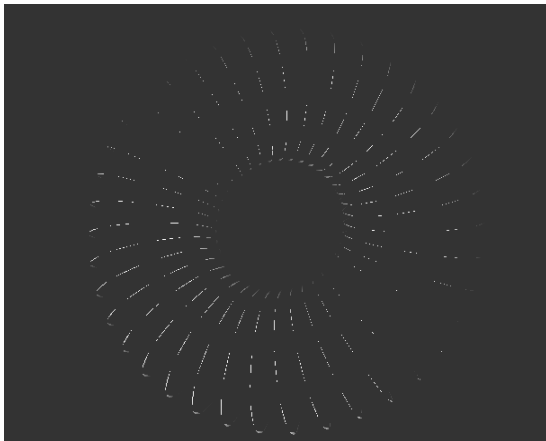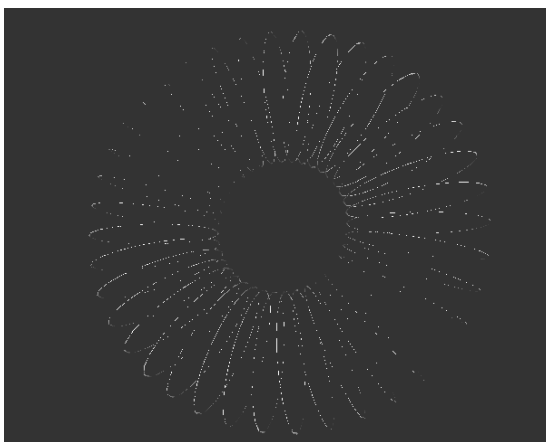Figure 110: Torus drawn as quads

Figure 111: Torus drawn as quad_strips

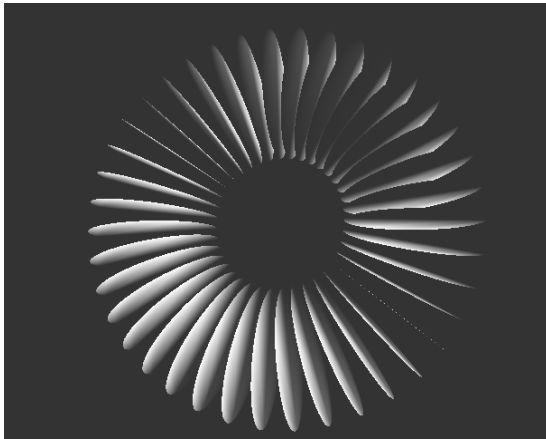Figure 112: Torus drawn as polygons
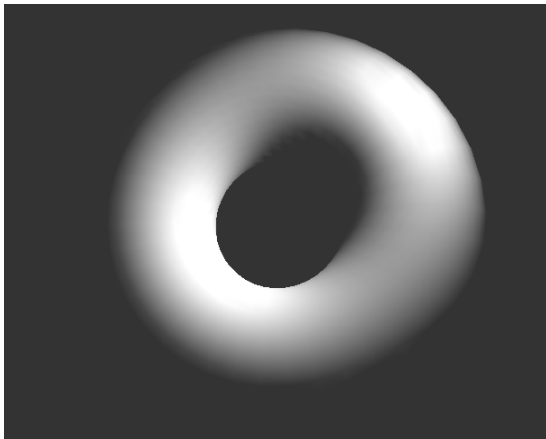

Figure 113: Torus drawn as tri_grids

Figure 114: The OpenGL Visualization Programming Pipeline (Khronos Group 2011)