

Repeat, Evolve, Adapt:

Portfolio of Compositions with Commentary

Volume 1

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Ph.D thesis in composition
in 2 volumes

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Abstract

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Keywords: composition, repetition, rhythm, evolving repetition, pattern, rhythm as action, techniques of transformation, rhythmic and interpersonal interaction, game, performance practice, dynamics of collaboration, relationships to the score, 20th and 21st century attitudes to notation

The pieces presented in this research project explore compositional approaches centring around evolving repetition. Through my compositional practice, I investigate repetition as a mechanism for generating perpetual musical transformation and creating hyperactive action based on shifting patterns. Repetition serves to establish rhythmic relationships and to mature patterns, as well as to drive persistent rhythmic instability and textural transience. These qualities generically summarise each of the pieces included in this portfolio, however every piece is particular, written for a specific context and approaching the characteristics described above from various perspectives.

Connected to these creative processes and aesthetic traits is the performer's precarious relationship with the score; the abundance of prescribed, rhythmically progressive actions magnifies the instability of the medium of notation. Alongside sound, I consider the interpersonal interactions between performers and the dynamics of the ensemble to be important factors in driving compositional thought. The growing importance of these ideas throughout the composition portfolio has led me to a reconsideration of the modes of collaboration involved in my practice. This includes an evaluation of traditions of performance practice in relation to the plethora of compositional and notational approaches in contemporary scored music.

The core of this research is the composition portfolio which comprises of twelve musical scores and recordings where available. This is supported by a commentary exploring both technical aspects of the work and a contextual discussion of the research, which considers recent and related approaches of other practitioners.

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<i>Bungee</i>	chamber orchestra	c.13:30
<i>Pinball</i>	violin, cello, piano	c.7:30
<i>Chameleon</i>	piano quartet	c.6:00
<i>Lachrimae</i>	chamber orchestra	c.11:30
<i>Red Charango</i>	charango	c.12:00
<i>Mechannequin</i>	picc., cl., mar., hp., pno., vln., vla., vc., db.	c.10:40
<i>Carousel</i>	string trio	c.12:00
<i>In the Loop</i>	tenor sax., bass tbn.	c.5:00
<i>Hurdling</i>	piano quartet	c.4:45
<i>Hide and Seek</i>	piano duo	c.5:10
<i>Zeta Potential</i>	large ensemble	c.17:30
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CD Track Listing*

<u>Track</u>	<u>Information</u>	<u>Duration (mins)</u>
1. <i>Bungee</i>	Performed by Northern Sinfonia, conducted by Peter Wiegold, The Sage Gateshead, 15/11/10	10:07
2. <i>Chameleon</i>	Performed by Ives Ensemble, Newcastle University, 2011	5:43
3. <i>Lachrimae</i>	Performed by Northern Sinfonia, conducted by Alan Fearing, Hall 2, The Sage Gateshead, 10/02/11	11:46
4. <i>Carousel</i>	Performed by Busch Ensemble, St. Mary's Church, Newcastle, 17/06/11	10:10

5. <i>In the Loop</i>	Performed by Helen Papaioannou and Hannabiell Sanders, Newcastle University, 21/03/2011	5:06
6. <i>Hurdling</i>	Performed by Notos Quartet, Hall 2, The Sage Gateshead, 01/07/12	4:50
7. <i>Zeta Potential</i>	Performed by Nieuw Ensemble, conducted by Jurjen Hempel, St. Pauls Hall, Huddersfield Contemporary Music Festival, 21/11/12	19:50

* All scores have been edited since the time these recordings were made, therefore recordings and scores do not match exactly. *Bungee* and *Zeta Potential* have been significantly edited since this time. *Bungee* and *Chameleon* were recorded during workshops.

Appendix CD

Players

Track 1

(using Figure 1) *Cogs*

Henrik Frisk (tenor sax.) Stefan Östersjö
(e.gtr.), Helen Papaioannou (tenor sax.),
30/11/2011, Inter Arts Center, Malmö,
Sweden

Track 2

(using Figure 1) ‘Experiment’

Paul Robert Amos (vln.), John Pope (Db.),
Luke Waterfield (Vln.), 22/03/2012,
Newcastle University

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Volume 1, Part 1: Commentary

Introduction

A turbulent stream of evolving repetitions which teeters between glimpses of stable rhythmic patterns and frenzied textural webs. Such a description could provide a generic summary of my approach to each of the pieces included in this portfolio, and represents the overriding musical qualities that emanate from this group of compositions.

However, every piece is particular in its own right, written for a specific context and approaching the characteristics described above from a fresh and changing perspective.

Often my interest in process is sparked by a fascination with refreshing a small pool of musical ideas; in some cases I think of a patchwork of different processes being employed onto material, as manoeuvres or machines which divert the pathway of the music. In other instances, the qualities of sounds inspire the beginning of a new process. Closely tied to this is the way that these prescribed processes implicate players in shifting interactions within the ensemble. Permutative rhythmic patterns are central to these changing interactions, which become most important to the music in which closer collaboration between the players and myself has been possible.

Along the course of this project, I became increasingly interested in the impact of prescribed, persistently transforming activity on the performer's relationship with the notation. This centres around the need for acute concentration from the performer towards continual rhythmic transformations in the score. I regard the actions resulting from notation to form a significant aspect of the music; processes of 'repeating, evolving and adapting' musical patterns are important both to sonic ideas as well as to the way that players relate to the score in performance. The turbulent transformations in rhythm and sound environment bring with them a need for performers to constantly adapt their understanding of rhythm to sustain the chain of action.

I regard this process in performance to be a significant aspect of the music, and influential to my compositional thought. Often, the requirements of overloaded, unstable rhythmic progressions have posed a challenge to the production of effective performances of my pieces. However, the precariousness of the players' interaction with notation has also become one of the most interesting contributors to my music. It has fuelled creative thoughts and my thinking about relationships between the agents of sounds, musicians and the score.

This investigation of the relationship between my creative ideas and the characteristics of performance has accumulated importance throughout my research. It has contributed to my continued interest in transformational techniques centring around evolving repetition, and the rather consistent aesthetic qualities of these compositions. The portfolio represents various responses to this question: how may the score facilitate intricate rhythmic coordination, whilst maintaining the desired awkwardness or instability in performing this highly mutable action? Sometimes such questions have been significant to a composition from the on-set, forming an intrinsic factor of the compositional concept. Other pieces approach these ideas less consciously or unintentionally, with reflections on those works contributing to subsequent compositions or illuminating significant issues in this commentary.

All of the submitted pieces have been written for specific collaborations, performance opportunities, or workshops. *Red Charango* and *In the Loop* resulted from collaborations instigated by myself, whereas *Zeta Potential*, *Pinball* and *Hide and Seek* were the result of successful applications to calls for scores or competitions. The other pieces were responses to workshop opportunities, of which *Kaleidoscope*, *Lachrimae*, *Carousel* and *Hurdling* were performed publicly. The research was structured in this way because I felt it was important for my compositional thinking to develop in dialogue with practical experiences throughout the course of the project. I composed pieces for different instrumentation and ensemble sizes, as one means of developing ideas in correspondence with a range of practical situations. This afforded space in my portfolio for compositions which allowed practical experience with musicians to develop and advance my ideas. These experiences contributed to my independent research, study and reflection of compositional technique.

The sometimes problematic process of achieving high quality performances has pointed towards incompatibility between some aspects of my approach to composition and the tradition of performance practice in Western notated music. The content of the portfolio consists of works which have involved a mix of collaborations with groups specialising in the classical tradition and musicians specialising in contemporary music practices. Within this research, the experience of collaborative processes has been wide ranging and this project has been a vital step in my evaluation of which pathway will be most advantageous for me in the future. This commentary also explores the way in which other practitioners have approached the issue of a growing gap between traditional performance practices and the variety within compositional approaches active today. A key aspect of this issue is the question of whether to compose works

which aim to form a contingency with traditional performance practices, or which strive towards developing performance practices rooted in composition-specific, or performer-specific strategies.

In the portfolio, the compositions are presented chronologically, from *Kaleidoscope* (2009) to *Zeta Potential* (2012). In the commentary, I begin with an overview of my compositional approach, which is followed by discussions of the overarching conceptual ideas emanating from the portfolio. I then discuss individual pieces and my work with graphic scores to exemplify these ideas and explore technical aspects of my practice. I do not discuss every piece in the portfolio in detail; I afford attention to pieces which highlight key aspects of my compositional approach, including pieces written for a variety of ensemble sizes and instrumental combinations. The pieces selected for discussion span the chronological range of the portfolio, but are not discussed in the order that they were composed; I draw out specific aspects of my approach as they become relevant to the overall discussion.

Turbulence and Transformation: an overview of my approaches to composition

The relationship between transformation and repetition was a key factor in my composition of all of the pieces in this portfolio. While I do not aim to suggest how the listener should hear or respond to the music, during composition I often imagine the audience in one sense being teased to ‘get into’ repetitive grooves, whilst also finding that negotiation rather turbulent in the music’s uncompromising momentum or tendencies to suddenly shift. The idea is that this action may draw the listener in with infectious patterns, yet then destabilise this experience by unhinging repetitions. Therefore repetition and maturation of patterns sometimes anchor moments of stability, but also contribute to a sense of fragility by constantly pushing towards change.

Continuous rhythmic instability has been an important quality in the vast majority of pieces in the portfolio. In part, rhythmic instability refers to the way that patterns and motifs are often subject to continual change for long periods of time. This means that characteristics of rhythm are highly changeable, and lack stability because of the ongoing nature of such processes and the forward-focused action; unchanging patterns rarely exist for long periods of time. My treatment of repetition contributes to this sense of frenzy; the music is audibly pattern-based, suggesting an element of stability in the rhythm. However, both the pulse and profile of the pattern are most often mobile and contribute to a forward drive.

Therefore in part, this turbulence emanates from the local rhythmic characteristics. When composing with clear metre, I often work with patterns or short cells which displace their position according to metre, so that the relation to pulse is mobile. Other strategies revolve around keeping an aspect of a pattern stable or unchanging, and altering the profile or characteristics of the rhythm. In several other cases, patterns have not been composed in terms of metre, but have been expressed within time signatures as a means of facilitating the many rhythmical changes which patterns undergo; here, the notation of metre facilitates synchronisation within the ensemble.

Processes of adapting rhythmic patterns are linked to the characteristics of pitch environment, timbre and texture, which are very important to constituting these states of precariousness. Since a number of parameters of the music are often in flux, I tend to treat certain qualities in a more static manner to maintain the sense of a somewhat consistent sound environment. My approach is often to intensify focus on rhythmic change by limiting my choice of timbre and pitch for substantial durations. The

approach to timbre and pitch importantly shapes the scale and rate of transformation. This often involves, for example, static harmonic environments, or sounds and pitch groups which gradually change over time. However, there are also several instances in which shifts in harmonic outlook or pitch motifs shape the pace of transformation, especially in cases in which rhythmic patterns are highly repetitive.

A number of pieces were composed in a ‘moment-to-moment’ manner, led by processes which mutate patterns. Such sequences are not necessarily led by a structural ‘goal’, but are shaped by the process itself, which involves repeating and evolving chains of events or gestures. However in several other pieces, another recurring strategy has been to shape change with a view to a shifting mass of interlocking layers, where the mutations of local activity are guided by textural ‘landmarks’, or arrival points. This textural change is often plotted or imagined visually prior to composition. Subsequently, my compositional approach partly involves moulding or chiselling the texture to achieve these imagined visual shapes and contours.

In one sense then, ‘Repeat, Evolve, Adapt’ refers to my compositional approach to transforming sounds, pitch-groups and textures, which play out through the evolution of repetitive rhythms. Yet this title also carries importance for the performer’s experience of working with the score. Alongside the gradually transforming soundworld and rhythmic cells, the players need to constantly adapt their sounds and rhythmic understanding as changes within the score ensue. The accumulative affect of this ‘Repeat, Evolve, Adapt’ cycle generates an increasing amount of instability and turbulence from cellular ideas; performers strive to continually alter their understanding of the pattern. Most often, instrumentation is used in a way that avoids soloistic playing, with rhythmic patterns distributed between interlocking parts. This means that evolutions of patterns not only cause players to reconfigure their own rhythmic part, but also the way in which it relates to the continual adaption of rhythmic relationships within the ensemble.

These compositions play with the challenge to ‘keep up’ with the predetermined evolving action. In part this concerns stamina, but also agility in concentration to constantly re-understand aspects of rhythm. This creates a somewhat precarious relationship with the score, bringing with it a risk of collapse and failed synchronisation. Composed rhythmic transformations set in motion the pressurised process of working through the score in real time; rhythmic transformation works in combination with choices of sound and pitch-environments which underpin this action. Therefore the heightened energy of the music is a result of a combination of

preconceived compositional choices and the process of performing the score in real time.

This relationship with the score is important to the sound itself and to the drama and ethos of the performance. However this high-risk situation needs unravelling, as although it is an important driving force of the music, satisfying performances also rely on the ability of the musicians to maintain their rhythmic coordination with fervour. The varying success of these performances has involved constant evaluation of my compositional choices. However, several experiences have pointed towards a need to evaluate the relationship between compositional concept and the ethos of the performance practice held by some of the ensembles. To unravel this issue, I begin by delving deeper into a discussion of how notions of risk and challenge function in my approach to composition, in correspondence with the precedent of Conlon Nancarrow.

Rhythmic Challenge and ‘High-risk’ Performance

Predetermined, rhythmically turbulent scores pose a high risk for live performance. With rhythmic accuracy being both a central requirement to the pieces’ success as well as the primary challenge in my compositions, a consideration of how these ideas play out in performance is important.

The precedent of Conlon Nancarrow’s Studies for Player Piano is important in a consideration of my approach to performance, rhythm, compositional concept and the score. Without attempting to draw superficial comparisons between Nancarrow’s music and my own, his approach is worth considering in a contextual investigation of approaches to hyper-active music based on rhythmical transformations which push the boundaries of human performance. Nancarrow’s Studies for Player Piano investigate a myriad of different temporal relationships, forms and characters in studies of multiple tempi. Whilst there is great breadth in these compositions, they do exhibit prominent aesthetic traits.

My compositional methods and the resulting sounds are rather different to Nancarrow’s; the rhythmic instability of my pieces results from the accumulative affect of evolving, pattern-based activity rather than complex frameworks for multi-layered tempi. However, there are important points to draw from Nancarrow’s music. One point that I wish to focus on in the Studies for Player Piano is the listening experience which

revolves around the combination of the superimposed tempi. The musical action is dominated by ongoing momentum, a saturation of texture and activity, and rhythmic progressions that eschew stability and emphasise the progressive transformation of rhythmic ideas. As is well known, the rhythmic complexity of Nancarrow's music led him to reject the practice of composing for human musicians for several decades. The historical importance of this precedent led me to question the relationship between the score, rhythmic turbulence and performance in my own work.¹

The vast majority of Nancarrow's Studies for Player Piano centre on techniques of divisive rhythm and combining multiple tempi. Several of them revolve around continually diverging and briefly converging layers which manifest themselves in hyperactive textural morasses. Study No. 3a exemplifies this in its play on the discernibility of characteristic boogie-woogie motifs and rhythms in a dense texture of superimposed tempi. The familiarity of these clear stylistic allusions teases the listener to hold on to them, however this task becomes increasingly difficult throughout the piece.

Eric Drott notes how several descriptions of Nancarrow's music focus on heightened intensity, being labelled as 'visceral', 'raw', and 'overwhelming'.² What interests me here is the way that Nancarrow's approach to texture, rhythm and form contributes to this effect. During listening, the trajectory of the studies often begins by presenting identifiable rhythmic threads in ostinati or canons, before moving into a sea of multiple tempi. Except for the most rhythmically discerning, this action is likely to be perceived as a shifting textural mass.³

In the opening of many of Nancarrow's earlier works for player piano, these tempo relationships tend to be introduced gradually, so that they are tangible and 'understandable'. Several of Nancarrow's later works favour more complex textures which eschew a division into independent layers on a single hearing. Many commentators have drawn attention to the manner in which Nancarrow tests or arguably alienates the listener's sense of perception by introducing perceptible rhythmic relationships, which then proceed to frantic activity. Drott summarises that

¹ There were also other factors which contributed to Nancarrow's decision to write for player piano. For example, his exile from America to Mexico led to a fairly isolated musical life in which he had little contact with either composers or performers for several years.

² See Eric Drott, 'Conlon Nancarrow and the Technological Sublime', *American Music*, 22/4 (2004), 543.

³ Kyle Gann loosely categorises Nancarrow's Studies into techniques based on ostinati (e.g. Studies Nos. 1, 2a, 2b, 3, 5, 9) isorhythm (e.g. Studies Nos. 6, 7, 10, 11, 12, 20), canons (e.g. Studies Nos. 4, 13, 14, 15, 16, 17, 18, 19, 26, 31, 34, 44, 49, 50), and acceleration/deceleration techniques (e.g. Studies Nos. 8, 21, 22, 23, 27, 28, 29, 30). See Gann, Kyle, *The Music of Conlon Nancarrow* (Cambridge; New York; Cambridge University Press; 1995).

‘...after a certain point the structural intricacies afforded by the player piano may become intangible, engendering textural confusion and disarray...Some dramatize it by unfolding processes that trace a path between the poles of structural transparency and opacity.’⁴

Margaret Thomas also underlines the idea that the listening experience may be dominated by the challenge ‘to keep layers perceptibly distinct for as long as possible’.⁵ This tension sometimes exists on a structural level as well as in the local rhythmic activity. For example, Nancarrow’s Study No. 24 is audibly structured around shifts between ‘sound-mass’ sections and passages which superimpose three simultaneous tempi.⁶ Nancarrow plays with the predictability of change between these two ideas by exploiting the regular pattern of these alternations, which is introduced at the beginning of the piece.

Nancarrow’s compositional approach treats rhythmic progression as a ‘challenge’, as something which teases the listener to keep up and understand the trajectory of change by presenting a process which is in some ways transparent. This feeling is accentuated by the use of musical language that alludes to familiar stylistic traits in bebop and blues. Yet this process is turbulent and unpredictable, often resulting in an atmosphere of frenzy. I emphasise these characteristics of Nancarrow’s music because of the resonance they have with the accumulative frenzy and saturation which arises from my own compositional processes. Important factors are the sense of audibly progressive processes of transformation, accumulative saturation of texture or progressive rhythms, and the challenges of playing music which avoids long periods of stability.

The complexity of Nancarrow’s simultaneous tempi led him to compose an extensive volume of compositions solely for player piano between the years of 1948 to 1983. Henry Cowell’s thinking and work on rhythm is known to have been influential to Nancarrow in his suggestion for the realisation of complex cross-rhythms, which posed problems in performance: ‘these highly engrossing rhythmical complexes could easily be cut on a player-piano roll.’⁷ For my music also, there is inevitably an obstacle between the intention of subtly evolving patterns, and the achievement of these qualities when collaborating with human performers. Challenges arise from the unintuitive nature of figures which are not always conceived in terms of metre, and because of the continual process of change throughout several pieces. My compositional approach

⁴ Eric Drott, ‘Conlon Nancarrow and the Technological Sublime’, 535.

⁵ Margaret Thomas in Eric Drott, ‘Conlon Nancarrow and the Technological Sublime’, 538.

⁶ Kyle Gann refers to some of Nancarrow’s works as ‘sound-mass’ compositions.

⁷ Henry Cowell, *New Musical Resources* (Cambridge: Cambridge University Press, 1930), 65.

often deliberately avoids ‘settling’ for long periods of time within a stable musical environment; simple repetitions of patterns gradually undergo slight changes, usually in rhythm, but also in pitch and gesture. Every new ‘arrival point’ is closely followed by a diversion in another direction. The process becomes increasingly pressurised. The intensity of this engagement with an ever-changing flow of events is coupled with the requirement of accuracy and synchronisation in players’ parts.

This has been met with apprehension from some musicians; the time needed for a preparation of one of my compositions does not easily slot into the working structure of classical ensembles. This has made it difficult to achieve performances which fulfil the rhythmic ideas with a substantial degree of accuracy. Alongside the unintuitive rhythmic progressions, a demand for effort-intensive activity contributes to this apprehension. Sometimes the choice of visceral gestures relates to the desired type of tone and timbre which arises from loud dynamics. Rapid rhythmic changes are therefore accompanied by alterations in physical motions involved in bowing, blowing, striking, etc.

In Nancarrow’s music, the mechanistic qualities of the player piano are of great importance to the thrill of the musical experience. Drott underlines the significance of the inhuman aspect of this sound source:

‘The most overt way in which Nancarrow’s studies draw attention to the loss of a point of “human” contact for the listener lies in their tendency to push beyond the limits of the performable. It is not solely a question of layering multiple independent tempi (although this plays a predominant part in distancing his studies from familiar performative models); it is as much by the speed and force with which his instruments are able to play back the rolls.’⁸

For his very focused aims of achieving multiple tempi, rhythmically independent lines and often extremely rapid speeds, the power and precision of the player piano machine is ideal. Performer nuances or idiosyncrasies seem to be something he wanted to avoid, as Nancarrow stated that ‘As long as I’ve been writing music I’ve been dreaming of getting rid of the performers.’⁹ Except for a few works written for performers in the 1980s when his reputation had grown considerably, Nancarrow’s collaboration with performers was one of necessity which he discarded for thirty-five years after he began to use the player piano machine.

⁸ Eric Drott, ‘Conlon Nancarrow and the Technological Sublime’, 534.

⁹ Conlon Nancarrow, in ‘Otherminds’, <http://www.otherminds.org/shtml/Nancarrow.shtml> (accessed 01/10/2012).

As I hope is clear from my scores, there are detailed, specific rhythmic and sonic ideas for which accuracy is important. One might ask why performance from human players is something that I pursue despite the difficulty of achieving these ideas; this is an era in which there is an abundance of options for realising complex rhythms electronically and digitally, which provide a wealth more choices than Nancarrow had. One part of this answer is that I have begun electroacoustic explorations and this is now becoming an aspect of my compositional practice.¹⁰

However, the most significant part of the answer to this question highlights very different considerations in creative work to Nancarrow, for whom ‘getting rid’ of the performers facilitated the realisation of innovative ideas. The thrill and intensity of human engagement with the score and performance of this rhythmic action is intrinsic to my ideas. This could seem to be an obvious statement, but in view of the difficulties in organising live performances meaningful to all parties involved, it is important to identify what aspects of performance are important to me.

My preconceived compositional ideas are not rooted in complex rhythmic calculations. More often, the individual musical units are fairly simple. By simple, I refer to the idea that pathways of ‘repeat, evolve, adapt’ are usually based upon short cells, motifs or pulse cycles which are not particularly complex to grasp as independent units. Pitch patterns are often static, or gradually change through repetitive action. Therefore my compositions never go beyond the capabilities of human performers in the way that Nancarrow’s do. However, the accumulative effect of chains of these ever-mutating patterns gives rise to a shifting rhythmic complex. This is both energy-intensive in terms of instrumental gesture and in players’ concentration towards frenetic musical development.

I refer to Nancarrow not only to illuminate important factors in my attitude towards performance, but also to affirm the aspects of rhythm and sound that I am interested in, which are importantly intertwined with aspects of performance. Part of this interest revolves around compositions which either abruptly shift or gradually adapt relationships to pulse and metre, or music which eschews a sense of pulse. These rhythmic parameters are often highly mobile, meaning that the act of performance is one of continually re-understanding repetitive ideas or grooves. This partly concerns an individual player’s relationship with their own notated part. Such activity also forces a

¹⁰ Such as in a recent collaborative electroacoustic composition work with Alessandro Altavilla, which we made for a choreographed video installation with Claire Pençak. The work was *Loom II: Chartless Rudderless Night*, for the Alchemy Film and Moving Image Festival in Hawick. I am currently composing an electroacoustic piece for a collaborative project with sculptor Jenny Allinson and choreographer Anthony Lo-Guidice.

reconfiguration of the rhythmic relationships within the ensemble, as textures use interlocking parts to create rhythmic patterns or pitch motifs; changes in interlocking parts impact on how the musicians relate to other members of the ensemble, particularly in pieces based on sectional relationships between the instruments.

We can see this in *Chameleon*, in which rhythmic change comes in varying the distribution of a repeated rhythm, shifting the positions of accents, and the rate of transformation within the music. These changes cause the performers to play out the pattern in different ways, which impact on the interlocking relationships between players. At times one's part is unified with another player in a shared rhythmic cycle. At other times, divided rhythmic cycles and qualities of timbre or harmony cause friction between individuals or pairs. As the pathway of the music is predetermined, the interactions between players are of course pre-composed, and encoded in the score. Nevertheless, during a performance, the score still channels an intense negotiation of rhythmic coordination which happens in real time (even if rehearsed and prepared), which has a frenzied quality. In *Chameleon*, part of what pressurises the interactions between players is the fleeting nature of these rhythmic combinations and their unstable design. As previously discussed, and as has been shown during certain performances, the potential for a failed negotiation of coordination and messiness in synchronisation is very real.

The submitted scores rely on the ensemble's ability to keep going through the score, and to achieve the predetermined ideas communicated in the notation. However, the score still functions as a means to channel slippery shifts of rhythm on the brink of fracturing the ensemble; the threat of de-synchronisation is very present during performance. And aesthetically, the sense of a musical activity which exists on the edge of collapse has been an important means of instilling vibrancy in the sounding result. The notion of an endurance challenge contributes to this effect. Tom Johnson gets to the heart of these issues of live performance in a review of a dynamic and physically exhausting performance by Charlemagne Palestine in 1977. Palestine's performance of *The Lower Depths: Ascending/Descending* provoked these thoughts from Johnson in his reflection on the concert:

‘[Performers] offer themselves to public view and invariably take risks, so that onlookers can witness some sort of minor miracle and watch one of their fellow musicians avoid calamity. There is always the possibility that Horowitz will blank out and be unable to complete a Beethoven sonata, just as there is always the chance that the sword swallower will slit his throat. And the fact that such

things don't happen makes us no less aware of the possibility that they could happen. At the nitty-gritty core this is what all live performance is about...¹¹

As Johnson affirms, the potential risk is a quality that invigorates most types of live performance when music, or other live arts and entertainment forms, are presented to an audience. Clearly this is present to widely ranging degrees within different concert programmes and settings. In performances of my compositions it has, for the vast majority of the time, been an important aspect of the music. Most often, I feel that this risk materialises positively, however there have been various cases in which moments of 'calamity' within highly structured pieces occur.

Refining my compositional approach and presentation of scores has been a constant process throughout this research. However, I have also come to believe that there is a discrepancy between the ethos of my compositions and the approach to performance during some projects. Part of this lies in the basic lack of rehearsal time afforded to some of the pieces, a common occurrence for several composers and ensembles in time restricted and financially limited projects. Yet there also seems to be another contributing factor to this discrepancy.

I have had the fortune of working with a number of very skilled musicians specialising in contemporary music, who have contributed invaluable to my refinement of compositions. However, in other cases, the saturation of rhythmic turbulence in my scores has at times created a quandary in performances, even when working with technically skilled professional performers of classical music. One issue is that there have been instances of writing for ensembles whose stylistic technique might not ordinarily default to the character that I intend, and with whom there has been limited time to converse with about such issues.

The above discussion highlights the importance of a high-pressure relationship between the scored compositional ideas and the act of performance. A high-pressure composition is not unique to myself. However, the particularly unrelenting nature of evolving patterns accentuates the effort-intensive process of repeatedly engaging with changing rhythmic cells. The vast majority of the music is not soloistic, instead basing transformation around interlocking parts within the ensemble. This quality also impacts on the sense of an intense collective effort as performers sustain momentum and coordination.

¹¹ Tom Johnson, 'Charlemagne Palestine Ascends', *'The Voice of New Music': New York City 1972-82, A Collection of articles Originally Published in The Village Voice* (Eindhoven: Editions 75, 1989), April 18th, 1977.

These characteristics are extremely influential to the resulting sound, as well as to the overall atmosphere of the performance. It is the *threat* of collapse, and pressure of maintaining synchronisation, rather than a total breakdown in communication, that imbues the pieces with this tension. As I will explore in more detail later in regard to *Lachrimae* and *Carousel*, this heightened intensity is not only for dramatic effect; local processes of transformation are intertwined with preconceived, directed ideas about changes within sound environment regarding pitch, texture and the pacing of events. This means that the order of events and substantial accuracy in a representation of the score is important for these pieces. Such music, which pushes inter-ensemble coordination to the brink of collapse, thrives on the risk and tension of this process. This calls for an approach to performance which not only accepts the challenge, but welcomes and values this heightened intensity as an important aspect of the music.

This seems unlikely to be possible in the context of established classical ensembles which are based upon highly ritualised modes of interaction. Ensemble dynamic is most often concretised according to traditional performance practices, which includes a general favour for presentation of performances which exhibit clear command and control over the score. Therefore compositional approaches which involve different modes or qualities of interaction are less likely to find success in such collaborative models. Clearly, technical skill is very important to the performances of my pieces. However, my music exposes and perhaps exaggerates the tension of the performers' turbulent navigation of the score; though the pieces do demand technical skill, performances of this music do not exhibit an ease of control. Therefore this is not simply a question of exhibiting virtuosity. Instead there is an emphasis on repeated application to gradually changing musical cells, and a need for continual alertness to changes in the score and in the parts of other musicians. An atmosphere of frenzy emanates from the combination of these various factors.

Such an approach to performance is not for everybody, and increasingly it seems to me that this style of composition will be most successful in collaboration with performers who have a mutual interest in these musical ideas. Given the importance of these aspects of performance, it now seems unsuitable to explore such ideas in collaborations which afford little space for investigating aspects of social interaction within the ensemble. This concerns the correspondence between compositional approach and the ideas of the performers.

I do not mean to suggest that individual classical performers could not have an interest and desire in this style of music.¹² Rather, the structure and working of classical establishments as institutions do not allow for the type of engagement and collaborative work that I feel my music needs. The same applies to many other contemporary creative practitioners. There are of course drawbacks and obstacles in building these more cohesive relationships between collaborative parties; those who would support such working relationships often face practical obstacles in terms of time limitations, and sizeable financial restrictions.

However, the path towards achieving good quality performances in time restricted work with standard classical ensembles comes with its own obstacles. Unless I were to doggedly commit to carving a pathway for myself in the field of classical institutions until the point that the music would be afforded a significant amount of rehearsal time, this is unlikely to be productive for me. Also, this would mean a commitment to composing for the standard instrumentation of classical ensembles. I now feel that such instrumentation is not ideal for the musical ideas that I have in mind or at least, my creative work should not default to these line-ups. Therefore as well as the practical difficulties of arranging successful performances in the classical world, my musical ideas would be best served in contexts which allow for work with more various instrumental combinations.

These questions about my own practice have led to a fundamental evaluation of the most fruitful and fulfilling way of organising collaboration. The relationship between performance practice and my compositional ideas evidently requires some investigation. This involves a reconsideration of the place and role of contemporary notated music in the concert hall setting. Amongst contemporary composers, there is a plethora of approaches to performance practice. However, it is fair to say that the majority of concert hall programming in the UK has been historically dominated by classical and romantic repertoire, which comes with traditions of stylistic performance techniques. Today, the content of concert-hall programming in the UK is progressively diverse, however in the majority of these institutions, the predominance of classical repertoire in concert seasons is still very much present. Resident orchestras and musicians in major concert hall venues most often specialise in music from the classical and romantic periods, extending to the early twentieth century.

The diversity of intentions and approaches among notating composers from the second half of the twentieth century onwards raises questions regarding the

¹² Various collaborative experiences have proved this not to be the case.

collaboration between such composers and classically-oriented establishments. The existence of increasingly individualised approaches to composition, working within a performance practice built around music of the past, poses problems. This inquiry concerns the nature of collaboration and communication between composers and institutionalised ensembles. Indeed many composers have long regarded permeation into such establishments as unnecessary, and of course there are numerous ensembles which focus on the performance of contemporary music. However, the historical weight of classical music practice means that it is still often a primary informant of notated performance practices.

In regard to the analysis of Western notated music, pianist Philip Thomas points to the relative lack of attention given to the constructive nature of the performer's role:

‘Discussion of the music is generally centred upon stages leading towards the creation of the notation, as well as the notation itself, but not what is subsequently done as a result of that notation...a performer’s decisions- her *actions*- may conversely shape understanding of the music itself.’¹³

In regards to my own music, I have drawn attention to the player’s pressurised, real-time navigation of the score, illuminating the actions undertaken when performing. By actions I refer to several processes undertaken during performance including adapting an understanding of repetitive ideas, reconfiguring dynamics within the ensemble, as well as performers’ corporeal movements. These aspects of the music are built through the process of playing, which are absent in the score alone; the notation of my compositional ideas mechanise these actions.

I am far from isolated in composing music which calls for commitment to highly effort-intensive playing. Questions of the nature of collaboration have been significant to several other composers whose music has raised similar questions. This calls for an exploration of important historical precedents, before returning to reflect on my own practice.

¹³ Philip Thomas, ‘A Prescription for Action’, in Saunders, James, *The Ashgate Research Companion to Experimental Music* (Farnham; Burlington: Ashgate, 2009), 78.

Precedents of the Regular Band Line-up

Since the 1960s, the need to reconsider the dynamics and means of producing contemporary music has become a commonly-voiced issue in Western scored music practices. One significant approach has emanated from New York's 'Downtown' scene, with Steve Reich and Musicians (formed in 1966) and The Philip Glass Ensemble (formed in 1968) providing significant examples of the formation of bands dedicated to one composer's music. Though these are the most often cited examples, the practice of close collaboration between practitioners was a trait of music-making for the majority of musicians active in this scene. Meredith Monk, Julius Eastman, Rhys Chatham and Glenn Branca represent other musicians whose collaborative practices have been at the root of regular bands or mutually complementary composition and performance practices. The formation of an ensemble which chooses and can afford time to develop an informed understanding of the music was seen as a much more attractive and viable option than attempting to infiltrate the concert hall tradition.

The disassociation between performers rooted in classical performance, and the perceived void in communication between players and composers deflected several composers away from this establishment. For some composers, this reaction signalled frustration with the aesthetic and cultural associations of the complexity or highly-intellectualised compositional ideas of the European avant-garde, associated with figures such as Boulez and Stockhausen. In the US, this was seen by some in the downtown scene as an aesthetic which manifested itself in New York's 'Uptown' composers such as Milton Babbitt.¹⁴

In Europe, Louis Andriessen has vociferously spoken of what he sees as a void between contemporary compositional thought and the workings of the classical music establishment. Andriessen has argued that, within this establishment, the lack of communication between composers and performers disassociates players from the specific characteristics and ethos of a particular composition. Most representative of his belief in democratic relationships between composers and players is his involvement in forming Orkest De Volharding in 1972. At the time, Andriessen spoke openly about his

¹⁴ Writer and composer Kyle Gann clearly regards 'Uptown' composers in this way: 'The Uptowners, such as Milton Babbitt and Jacob Druckman wrote complicated music in European genres' whereas 'Downtown music was simpler and less pretentious...' See Kyle Gann, *Music Downtown: writings from The Village Voice* (Berkeley: University of California Press, 2006), xiii. A very similar account was given by Rhys Chatham in his discussion of the origins of his music at Tusk Festival in Newcastle, 9th October, 2011 (at Cluny 2). Chatham strongly gave a negative impression of the 'complexity' of Babbitt's music as the antithesis to 'Downtown' aesthetics.

aversion to the workings of the symphony orchestra, calling for recognition of the relationships between musical practice and society, as outlined here:

'It turns out that musical material cannot be separated from the method of production. The term ‘method of production’ is divisible into three phases:

1. The conception of a composer
2. Confronting the performers with the idea;
3. Confronting the audience with the performance.¹⁵

An important factor of Andriessen’s belief in Orkest De Volharding as a democratic group was that the musicians, coming from a mixture of jazz and classical backgrounds, chose to be there. Because of this commitment and perseverance, Andriessen claimed at the time that

‘De Volharding tries to uncover the relationships between conception of music (phase 1, the composer), production of music (phase 2, the performing musicians), and consumption of music (phase 3, the listeners) and to change them. In so doing, De Volharding starts from a critical attitude towards prevailing practices, in which existing relationships are affirmed. This critical attitude stems from a socially critical stance.’¹⁶

Speaking in reflection of the performance of his piece *Anachronie I*, Andriessen claims: ‘I saw that, in order to resolve this, we needed to work not only on better connections between performers and audience...but also on the relationship between composer and performers.’¹⁷ Believing that ‘music is in any case a *reflection* of a society’, the music composed by Andriessen revolves around acts of collective power. Pieces such as *Workers' Union* (1975) and *De Staat* (1972-26) are anti-individualistic, involving the players in communal challenges which demand high ‘staying power’ and a rhythmic approach which favours synchronicity (often unison) within the ensemble.¹⁸

However, we must also acknowledge that despite the uncompromising quotations given above, for large-scale pieces after these statements were made, Andriessen did also choose to present music in established concert hall settings with large groups of musicians he did not know. *De Staat* actually marked Andriessen’s return to the concert hall, followed by *De Tijd* (1980-81) and *De Snelheid* (1982-3), noticeably the larger-scale works which form significant and well-known pieces in his oeuvre. *De Staat* and *De Snelheid* very much call for a muscular performance style. The

¹⁵ Louis Andriessen, ed. Mirjam Zegers, *The Art of Stealing Time* (London: Routledge, 2002), 130.

¹⁶ Ibid., 135.

¹⁷ Ibid., 130.

¹⁸ Ibid., 131.

former is all the more potent alongside its overt political message, which was undoubtedly a significant infiltration into the music performed in institutionalised musical establishments.

However it seems that to facilitate these large-scale pieces, Andriessen deemed it necessary to work in more traditional settings with a greater gap between composer and players, rather than with democratised ensembles.¹⁹ Paul Griffiths suggests that during the late 1970s and 1980s, ‘though Dutch society had become more liberal, as had societies throughout the Western world, power remained where it was and the great institutions, including the Concertgebouw, were unshaken (as was also generally the case elsewhere).²⁰ Griffiths uses the example of Andriessen and his large-scale pieces to point to the dilemmas surrounding composers’ choices regarding collaboration, production and presentation of their work. He speaks broadly in regard to the period between the 1960s to 1980s:

‘Andriessen’s dilemma was that of the avant-garde composer throughout this period, politicized or not: whether to maintain a position outside the mainstream and thereby probably forfeit opportunities to work on a large scale and engage with internationally prominent performers (the position Andriessen had adopted hitherto, and to which Cardew and Rzewski, Denyer and Wolff, among others, held true) or to enter the approved culture and try to change things from within. Andriessen was evidently torn.’²¹

However, in the work of composers who have been significantly influenced by Andriessen, his emphasis on unity between the conception, production and presentation of new music has been felt. For Graham Fitkin, who studied with Andriessen, sustained collaborations and the formation of his own band have often been essential conditions for the creation and production of his music. At present, The Fitkin Band is described on the composer’s website as ‘focusing on new and rhythmically intricate music. Performances are amplified and tread the line between formal concert genres and more informal musics.’²² This statement points to the importance of a regular band in fulfilling his explorations in ‘rhythmically intricate music’. A dedicated, consistent group of musicians allows the development of a specific performance practice focused on rhythmic creativity and proficiency. As the players of the nine-piece band choose to

¹⁹ Regarding the genesis of and ensemble needed for *De Staat*, Andriessen says ‘Things which I couldn’t do with De Volharding orchestra because of technical limitations, I had to achieve in another way.’ (*The Art of Stealing Time*, 160).

²⁰ Paul Griffiths, *Modern Music and After* (Oxford: Oxford University Press, 2011). 352.

²¹ Ibid., 352.

²² Graham Fitkin, ‘The Band’, *Fitkin*, <http://www.fitkin.com/future/band> (accessed 19/12/2012).

be members of the group, one can assume that they too share an interest in this field of music, so that the compositional interests and ethos of performance are aligned.

Fitkin is just one example of various composers who believe in such an approach. Of these, Steve Martland, who also studied with Andriessen, most forcefully vocalised his belief in specifically-formed ensembles as providing the best opportunities for creating ambitious new music. Speaking about his own band in the liner notes for *Horses of Instruction* (2001), Martland emphatically expressed his anti-establishment stance:

‘I wanted to write some music that would be portable and also would avoid the classical concert world of bourgeois music-making and consumption. I can’t think of a greater luxury as a composer than writing music for, and working with, musicians whom you relate to. Conversely, I have found nothing more alienating than writing music for a symphony orchestra where no one knows who you are, what you do, or what you are trying to do...’²³

The creation of his own group in The Steve Martland Band has clearly played a major role in producing and encouraging a performance style founded on extreme rhythmic proficiency and effort-intensive music. Martland’s composition *Horses of Instruction* requires great dexterity to sustain a shifting pulse and frantic irregularly-repeating patterns; it would be unlikely that the sort of synchronicity required for such a piece would be as effective with a group of musicians who had not been able to approach the music with such commitment, or had an unrelated performance background. As demonstrated in his music and in his own words, traits of classical performance style are something that Martland wishes to avoid. Of particular significance in both Fitkin and Martland’s bands or chosen collaborations is the decision to work with musicians from backgrounds straddling a mixture of rock, jazz, classical and certain pop styles; this is deeply influential to the style of performance. In Martland’s music, the conveyance of collectively achieving rhythmic precision is particularly clear in the pieces from his album *Horses of Instruction* and in *Danceworks*.

Several composers of music which demands high stamina or rhythmic proficiency have done so very effectively, and have sought collaborations which work together with the compositional ethos. If we bring this up to the present day, composers such as Ed Bennett and Annie Gosfield are just two who show this in abundance. And there are several groups who have developed great rhythmic aptitude and well-oiled ensemble dynamics, who are capable of performing the most rhythmically challenging

²³ Steve Martland, ‘The Steve Martland Band’, liner notes for *Horses of Instruction*, (London: Black Box, BBM 1033, 2001).

pieces to very high standards.²⁴ However, the difficulties posed by pieces which require great familiarity to develop rhythmic stamina and dexterity still linger heavily.

Therefore the reactions from Andriessen and others from 1960s/70s are useful in considering ideas of composition and ensemble culture.

While I do not share Andriessen's categorically Marxist stance, similar issues regarding performance practice have also permeated through my research. Andriessen is quick to emphasise the inextricability between the sound and technique of playing, and the continuous action of several of his scores play an important part in demanding a muscular, uncompromising style. In some senses this is very highly stylised, as this approach aims to recognise and use the techniques and style of performers as much as to challenge them. The above quotes cited from Andriessen also highlight the important connection between a committed group of individuals and this particular, rather demanding performance style.

My research has been importantly influenced by the variety of musicians with whom I have had the opportunity to write for. Encountering a number of different opinions, skills and playing styles has been very valuable to the work of this portfolio. I have previously mentioned that some approaches to performance have unveiled a collision between the ideas in the compositions and the ethos of performance practice. In part, this is because without dedicated rehearsal time, it is difficult to approach these scores with confidence and zeal. However this also concerns an issue of performance technique, which in my music revolves around unrelenting action, and a robust approach to playing which is required to produce the intended sounds. These features do not generally align with classical technique. This is not to say that it is only a question of power, but of having the opportunity to work on and discuss the qualities of sound and instrumental approach in different pieces; this is necessary both for myself and for performers. The ensemble or band culture at the centre of Andriessen, Martland and Fitkin's music provides strong models for close collaboration with musicians, which suggests a possible pathway for myself. I imagine my involvement in such a band to take the form of composer in some instances, and performer in others. This would therefore be a band with multiple composers, rather than the model of Martland or Fitkin's bands.

The idea of forming a regular band provides one solution to building fruitful collaborations for the future. However, this still leaves the issue of how performers go about working with notation itself. How do players approach scores for which one

²⁴ Just two examples would be Ireland's 'Crash Ensemble' and New York's 'Bang on a Can All-Stars'.

cannot assume a specific relationship between performance practice and notation? This raises questions in regard to how performers are involved in the process of working with unfamiliar methods of notation, or compositional styles which present new challenges in terms of approach to performance. Such issues apply not only to collaborations between parties who do not know each other, but also the process of working with notation in regular band line-ups. Contemporary compositions might not clearly refer to a backdrop of tradition and shared language, instead requiring time-intensive work to develop a way of relating to the score from the roots up. Some practitioners regard this as a barrier in creating new pieces, whilst for others, this process is productive, and something which lies at the very heart of their practice. In the following passage, I focus on how the model of collaboration between practitioners relates to the challenges of interpreting contemporary scores.

Interpretation, Performance Practice and Collaboration

‘The fractured, disassociated stylistic panorama facing a performer today simply does not allow the performer a great deal of opportunity to plunge into the interpretational implications and subtleties of nuance of each and every composer’s native dialect; it is really up to the composer, then, to gently suggest, via the relation of his notation to perceived content, form or executive difficulty, what sort of practical interpretational deviation from this particular norm might be most fruitful.’²⁵

This statement from Brian Ferneyhough was made in 1988; the differences within the ‘native dialects’ of today’s composers have only become more various. In contrast to this breadth, classical performance practice and the organisational structures of classical institutions have remained relatively unchanged. What are the repercussions of this on the relationship between compositional concept and performance practice? On the one hand, Ferneyhough suggests that it is impossible for performers in the present day to acquaint themselves with the particularities of each individual’s compositional approach. On the other hand, he also considers it undesirable to compose pieces

²⁵ Brian Ferneyhough, ed. James Boros and Richard Toop, *Collected Writings* (London: Routledge, 1995), 319.

designed to form a ‘contingency’ with interpretational approaches rooted in ‘a silently assumed aesthetic background’.²⁶

Ferneyhough’s negotiation of this dilemma revolves around issues of complexity in both his compositional ideas and his methods of notation. His pieces involve extremely dense, highly intricate notational prescriptions; this often comprises of a large amount of detail in several musical parameters, meaning that complexity infiltrates several different aspects of performance action and intended sounds. As well as the bombardment of information, the individual segments of instrumental or vocal parts are themselves difficult to achieve; the process of working through the notation in real time is therefore an exceptionally difficult task. This multi-levelled complexity means that several scores present feats which are impossible to realise. Ferneyhough acknowledges that this is sometimes his intention, stating that some of his works, such as *Unity Capsule*, ‘deliberately overstep the limits of the humanly realizable.’²⁷ In part, he attributes this quality to psychological qualities of working with such notation: ‘It is largely a question of mental attitude, of not allowing the conscious mind to reflect too much ahead of the performative fact.’²⁸ Ferneyhough specifically refers to such ‘psychologising’ in the performance notes of his composition *Lemma-Icon-Epigram*.²⁹

Ferneyhough’s approach to composition and notation is certainly not only a reaction to interpretations which are rooted in institutionalised performance traditions. His choice of this approach to notation is entwined with his compositional aims, and he relays these ideas to performers through notation which comprises of predetermined sounds, complex rhythms, and detailed instructions relating to tempo. Whilst he is clearly aware that this pushes performers to the brink of what is possible, he also expects performers to commit wholeheartedly to achieving these ideas as accurately as possible.³⁰ However, he does suggest that his notational approach is in part aimed to discourage such performance approaches which are shrouded in institutionalised performance tradition: ‘The performer recreates the work in his own image, not according to some arbitrary process of homogenization via the academy.’³¹

²⁶ Brian Ferneyhough, ed. James Boros and Richard Toop, *Collected Writings* (London: Routledge, 1995), 318.

²⁷ Ibid., 319.

²⁸ Idem., 319.

²⁹ ‘The rhythmic notation reflects the composer’s views concerning the ‘psychologising’ of interpretative reaction, seen as an integral component of the work structure...’, Brian Ferneyhough, ‘Performance Notes’, *Lemma-Icon-Epigram* (London: Peters, 1982).

³⁰ See Brian Ferneyhough, *Collected Writings*, 319.

³¹ Idem., 319.

Ferneyhough's approach pressurises an intense, composition-specific approach to questions of performance. As this is 'a notation which deliberately sets out to offer a *practical surfeit of information*', the performer is forced to make choices for themselves, and develop their own response to the composition.³² The excess of information in the score calls on the performer to make decisions regarding what elements of the music to prioritise. Ferneyhough describes these ideas as 'tactics' which 'provide the performer with a broad and deep field of practical decision-making'.³³

However, I would argue that this is in fact an example of one method of encouraging a player to 'plunge into the interpretational implications and subtleties of nuance' of Ferneyhough's compositional 'dialect'. Ferneyhough's manner of achieving this is also more forthright than to 'gently suggest' an interpretative response (as suggested in the quote which opens this passage). As the composer acknowledges, this is not a fool-proof method for successful performance, which would be an impossibility in any case. Rather, it is a strategy which can only be successful with commitment to finding a considered, personal response from performers; anyone aiming to perform one of Ferneyhough's pieces needs to spend substantial time familiarising themselves with the score's particularities and the nuances of his approach. This is not a collaborative approach to the issue of unravelling the notation; it depends on the performer's commitment to spending a substantial amount of time working with the score prior to performance.

Whether one favours this strategy or not, Ferneyhough's music and writings are productive in clearly highlighting that the score cannot be understood as synonymous with the musical work. Ferneyhough says that:

‘A consequence of the increased emphasis on the unstable interface: performer/notation, the deeply artificial and fragile nature of this often naively unquestioned link, is that constant stressing of the ‘fictionality’ of the work (‘work’) as a graspable, invariant entity, as something that can be *directly transmitted*.’³⁴

The exploration of the often unquestioned relationship between performer and notation is a necessary process for many practitioners. This involves not only an exploration of the interface of notation, but also the way that this interface relates to the nature of collaboration between practitioners.

³² See Brian Ferneyhough, *Collected Writings*, 4.

³³ Brian Ferneyhough in James Bunch, *A Brief Comparison of Independent Elements of the music of Brian Ferneyhough and Christian Wolff* (Paper_University of Illinois, 2006-2010), 1.

³⁴ Brian Ferneyhough, *Collected Writings*, 5.

Stefan Östersjö has researched the field of the musical work and a variety of working relationships between composers and performers active today. As a highly active improviser and score-based performer who has worked closely with many composers and players, Östersjö is well placed to carry out this research. Östersjö, who plays several types of guitar, undertook practical projects in which he documented and analysed the development of pieces with six diverse composers.³⁵ He explores how practitioners negotiate the challenge of engaging with the myriad of notational approaches and compositional voices which exist. In Östersjö's words, this involves exploring 'how a performer may 'cope' with the diversity of musical subcultures'.³⁶

Despite his admiration for Ferneyhough's own approach, Östersjö rejects the composer's assertion that 'it is no longer possible to 'plunge into the interpretational implications and subtleties of nuance of each and every composer's native dialect'.³⁷ He instead argues that Ferneyhough's music exemplifies the

'deconstruction of the tacit agreements between composer and performer, which can be regarded as the common ground for the function of musical notation in ordinary practice, [which] is in [Östersjö's] understanding understood as a powerful imperative for performer and composer to reconstruct a close interaction between the practices of composition and performance'.³⁸

In his research project, Östersjö acts upon this in several contrasting collaborations. This includes the case of working on Per Nørgård's *The Field of Returns* for which Östersjö describes himself as 'learning a performance style that was new for [him]'.³⁹ Östersjö speaks of the process of working closely with Nørgård to gain an understanding of the composer's individual approach to *rubtato*, use of accents and rhythmic notation. Intensive work with the composer was necessary to learn this very specific performance practice, in which guitarist and composer seemed to interchangeably act as mentor or mentee. In contrast, in Östersjö's work on the piece *Viken*, he describes his working relationship with composer Love Mang as a 'fully integrative collaboration between composer and performer' from the onset; a performance practice was discovered and shaped together.⁴⁰ He describes the process in this way:

³⁵ See Stefan Östersjö, *Shut up 'n' play!: Negotiating The Musical Work* (PhD thesis_Lund University: Malmö, 2008).

³⁶ Stefan Östersjö, *Shut up 'n' play!*, 380.

³⁷ Brian Ferneyhough, *Collected Writings*, 319.

³⁸ Stefan Östersjö, *Shut up 'n' play!*, 3.

³⁹ Ibid., 119.

⁴⁰ Ibid., 155.

‘In different phases of our work we were both found to be writing music; working analytically in non-real time; preparing material for the piece; playing guitar- when producing material for the acoustic part and when interacting with the electronics in the process of defining the electronic part.’⁴¹

These are just two examples of several other working processes with different practitioners. My overview of these approaches does not reflect the subtleties of the collaborative processes. However, they provide brief insight into two (of several) ways in which performers and composers work together either to share or develop specific performance practices. For Östersjö, this ranges from learning the particularities of a score through close work with the composer, to an integration of the roles of composer and performer or improviser. He shows his role to be creatively active and highly influential in collaborations with prescribed stave scores, stimuli for improvisation and mixed notational systems.

At the heart of this work is Östersjö’s unravelling of the tacit agreements between practitioners. According to Östersjö, this investigation provides potential for ‘informed interpretation’ which has a constructive element in the work, rethinking what interpretation means in the context of a close collaboration. He unpacks Stravinsky’s famous denouncement of interpretative performances of music in favour of pure ‘execution’:

‘...can this really be understood as a declamation of the death of the interpreter, in favour of the executant? Is it not an excellent introduction to informed musical interpretation? The ‘hidden’ elements that defy definition’, the inability of ‘verbal dialectic’ (or for that sake the inscriptions in a score) to define ‘the musical dialectic’, isn’t this fundamentally a defence of the need for ‘informed interpretation’?’⁴²

Östersjö explores an interpretative approach as something which grows from close communication between parties. In this model, the musical work exists in the relationship between collaborative agents. Östersjö gives not an opposition to typical thinking from the 1960s, but what he views as a change in opinions surrounding interpretation in scored music:

‘In the 1960’s [sic], most of the attempts at a reconsideration or denouncement of the regulative work-concept were initiated by composers, still writing ‘regulative’ instructions concerning the ways in which a performer should

⁴¹ Stefan Östersjö, *Shut up ‘n’ play!*, 196.

⁴² Ibid., 47.

‘execute’ the intended kind of freedom of choice. What may be happening in the present day is a shift of another, more comprehensive nature: a turn in the practice itself towards a (return to a) closer collaboration between the two agents.’⁴³

It certainly seems to be the case that in contemporary musical practice divisions of labour, boundaries between stylistic traditions, and collaborative roles are becoming productively destabilised. Östersjö’s own work as a performer and improviser both in this research project and in his work in general is one of many examples that show that it is possible to work with close, intertwined dialogue between performance practice and compositional ideas, and for performers to be regarded as having a creative role. Not only is it possible, but necessary for the success of the composers, performers and improvisers that he collaborates with.

I do not mean to suggest that collaborative approaches based around fully integrative relationships are the only solution; Östersjö’s research ranges from models including clearly differentiated roles to those including integrative roles. Rather, I think the central issue is an awareness and investigation of the assumed roles in collaboration, in an effort to find the most effective working solution. ‘Effectiveness’ needs to be considered in terms of a satisfactory collaborative process as well as in the aesthetic result. Sam Hayden and Luke Windsor make a similar point in their article, ‘Collaboration and the Composer: Case Studies from the end of the 20th Century’. Through their analysis of case studies, they come to the unsurprising conclusion that collaborative processes which are socially satisfying do not always correlate with successful aesthetic results (although it certainly does not harm the results). However, they also point out that in these case studies, a shared aesthetic goal was a major boost both to satisfaction in process and product.

Hayden and Windsor emphasise that transparency and dialogue concerning expectations of participatory roles may open up new creative possibilities, but also create more efficient or fulfilling working relationships; they underline the importance of *effective* working relationships, rather than valorising one particular collaborative model. They argue that a more traditional approach ‘which assumes fixed roles for composer and musicians must be directive, is not the only possibility...Indeed, the ability to question this assumption might be key to improving the efficiency and quality of the process itself.’⁴⁴ These case studies show the productiveness of being able to

⁴³ Stefan Östersjö, *Shut up 'n' play!*, 374.

⁴⁴ Sam Hayden and Luke Windsor, ‘Collaboration and the Composer: Case Studies from the end of the 20th Century’, *Tempo*, Issue 240, (2007), 38.

constantly question assumptions about one's role in the creative process. This can avoid frustration in collaborative relationships built around ritualised performance practices, which can hinder both interpersonal process of working together and the aesthetic result. In cases where 'interactions follow the assumptions of both parties', the outcome of the collaboration is limited:

'performer and composer tacitly agree that the role of the composer is creative and the role of the performer is technical. Any problems that arise here can only be solved within this limited scope.'⁴⁵

For myself, amongst numerous other composers and performers, this statement describes familiar collaborative circumstances. Therefore, I am now pressed to consider what will be the most advantageous means of collaborating with practitioners in future projects. In this research, performances and working relationships have been more successful on some occasions than others. These mixed experiences are worth evaluating so that I may build upon the collaborative models involved in the most satisfying projects.

I have taken valuable opportunities to attend workshops and have my music performed in very short-lived projects; the maximum amount of clarity in presentation of musical ideas has been important to facilitate work with my scores. Using traditional notation has facilitated the realisation of sonic ideas, and a particular pressurised interaction with predetermined, mutating rhythms; to a degree, the shared language of traditional notation was intended to provide a backdrop of stability, to make workshops and rehearsals efficient. However, as we have seen, the use of traditional notation does not come with a shared assumption of performance practice.

The earlier compositions of this portfolio involved little dialogue and communication between parties. In regard to these works, I have spoken at length about the importance of a pressurised rhythmic interplay between musicians. This has revolved around notions of accumulative pressure deriving from multiple chains of simple cells or repetitive patterns. Whilst this has been successful in performance on several occasions, it is also clear that for this strategy to work, a great deal of rehearsal time is required for the performance to live up to the full potential of the compositions. There is no denying that the cycles of 'repeat, evolve, adapt' which dominate my music demand a great deal of concentration and commitment to music which is highly energy-

⁴⁵ Sam Hayden and Luke Windsor, 'Collaboration and the Composer', 30.

intensive. Therefore it is important that there is shared investment in the music between collaborators and myself.

The pieces which have involved the most fulfilling processes and I think, the most successful results, have been those which have involved closer collaboration between myself and performers. This includes *Zeta Potential*, for which I had much more contact time and dialogue with the Nieuw Ensemble than during the composition and preparation of the other large ensemble pieces. I would also include *In the Loop*, for which the process of rehearsing and editing the piece took place in very close collaboration with Hannabiell Sanders. It is also significant that both Sanders and the Nieuw Ensemble have experience in performing a wide range of contemporary musics; the performers contributed significantly to my revision of ideas and my development of sketches.

These two compositions also indicate the way that inter-ensemble dynamics, or features of social interaction have been very significant in the later pieces of this portfolio; this is especially the case for collaborations which involved close work and ample dialogue between myself and players. My compositional approach entwines decisions focusing on sonic aspects of the music with inter-player dynamics; this raises questions of power relationships, recognition of the actions of others, methods of giving and receiving signals to and from others, etc. In the future, such compositional projects would need to take place in contexts in which aspects of social interaction are open to be explored. This seems unlikely to be possible in the context of established classical ensembles which are based upon highly ritualised modes of interaction. That is not to say that there are not fruitful collaborations to be had with established ensembles specialising in contemporary music.

What is most appealing to me, and also possibly more pragmatic, is to seek out relationships with musicians which are on the whole more genuinely collaborative. Alongside this must come the space for reflection on and investigation of the roles within the collaboration. I have come to realise that my ideas will be most effective in collaborations with players who have an interest in committing to the music. The development of the musical ideas needs to take place in close correspondence with players themselves. Initially, responsibility for this lies with myself, and I now aim to actively form such collaborations. As a result of this doctoral research, I am now making plans to form a group of musicians who will choose to take part in developing pieces; my aim is for players to join because they have an interest and investment in the ideas themselves. This will either involve putting out a call for specific instrumentalists,

or the group will arise out of the available instruments of collaborators who share an interest in my musical ideas.⁴⁶ My approach to composition will therefore also need to take into consideration the backgrounds, skills and opinions of the players, so that a musical ethos can be formed collaboratively.

In the Loop was a significant step in thinking about successful models for collaboration. It was also important in my consideration of the way that my compositional ideas relate to the interpersonal dynamics between players. Revisions or ideas regarding our approach to performance were influenced both by myself as composer/performer and Hannabiell Sanders, the trombone player. In this piece, many of the interesting and enjoyable aspects of the rhythmic pattern arose out of the network of communication between us. I think the human idiosyncrasies in the recording of this piece form interesting and valuable aspects of the listening experience. This may partly be because the players' ability to maintain momentum is such an important feature of the piece, and because there is a transparent link between the pressurised nature of actions and the resulting sound. *In the Loop* exemplifies key aspects of my compositional approach in regards to inter-ensemble dynamics and the challenges posed by continual action based around evolving repetition. For this reason, I now discuss the piece in more detail to introduce some key concepts which have relevance for the portfolio in general.

In The Loop: evolving repetition and interpersonal dynamics

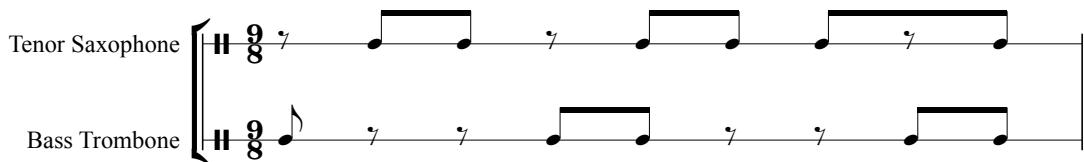
Though it is a short composition, *In the Loop* has illuminated the way that challenges of maintaining rhythmic coordination and momentum impact on the relationship between players. I begin by giving some background to the piece to lay the foundation for a discussion of the how qualities of inter-player dynamics are intertwined with my compositional choices.

In the Loop was composed for myself on tenor saxophone and Hannabiell Sanders on bass trombone. It was written for the two of us because the instrumental combination was attractive, and because I thought Sanders's approach to performance would feed well into my compositional ideas. In part, this was because of her rhythmic aptitude and Sanders's performance style in her own band; this music is often centred around repetitive grooves which fuel the sustained intensity and shifting textural blocks

⁴⁶ I am currently exploring the second of these two options in this new project.

characteristic of her group. We also had a history of playing together in various groups, in which we arranged her parts or created our saxophone and trombone parts together.

The vast majority of our collaborative experiences had involved non-score-based organisation or skeleton-score charts in which we had formed a unit within larger bands. *In the Loop* uses the score to play with isolating and intensifying a form of the co-dependent repetitive activity in our previous work. This composition builds a stream of near-continuous playing, in which the players' alternating parts jump between registers according to shifting accent patterns. The concept of *In The Loop* arose from the ideas explored in *Chameleon*, as both compositions repeat a single pattern which is constantly adapted through changes in accentuation. For *In the Loop*, the focus on repetition is intensified, with both musicians sustaining a single part for the majority of the piece. The pattern is subject to change in the second half of the composition in order to instigate greater shifts in pace, however it maintains a focus on the repetition of short cells.



Example 1: repeating pattern for *In the Loop*

Musical score for *In the Loop*. The score consists of two systems of music. The top system starts at measure 34 and continues to measure 36. The bottom system starts at measure 36. Both systems are in common time (indicated by a '9/8' signature). The Tenor Saxophone and Bass Trombone parts are shown. Measure 34: Both instruments play eighth notes and sixteenth note pairs. Measure 35: Both instruments play eighth notes and sixteenth note pairs. Measure 36: The Tenor Saxophone plays eighth notes and sixteenth note pairs. The Bass Trombone plays eighth notes and sixteenth note pairs. Measures 37-38: Both instruments play eighth notes and sixteenth note pairs.

Example 2: first set of changes to the pattern, *In the Loop*

Example 2 continued

Example 3: second set of changes to the pattern, *In the Loop*

The shifting balance between similarity and contrast in instrumental sound accentuates the tension throughout the piece. Some passages entail rapid changes between register and timbre, whereas other sections aim to blend the sounds of the instruments. For example, at bar 9, the players lock into repeating leaps of a seventh interval, where these jumping movements shift register frequently. I thought about high intensity not only in the impression of physical pressure, but also in the fluctuations between repetition and change in the music's large scale sequence of events.

In writing and playing the piece, I imagined a tug of war between repetition and evolution. Short durations of repetition exist in an awkward state between a matured groove and a progressive stream of activity. The repetitive three-bar sequence at bar 43 exemplifies a number of changes in register, pitch and accentuation. Bar 43 instigates

highly mobile movement including numerous shifts between instrumental ‘voices’ within a short duration; players need to overcome a variety of angular leaps, registers, volumes and accentuation, constantly adapting to the evolving repetitions. Conversely, in bars 21 to 26, the instruments meet on a unison pitch, accentuating the expectation of an increase in pitch movement due to the lack of change in pitch, register and accentuation. This claustrophobic motion also heightens attention to idiosyncrasies in the performance. Although the piece is dominated by a constant forward drive, it consists of shifts in the pace of change throughout the piece. For example, between bars 21 to 29, the accumulation of wide leaps prepare for divergence to registral extremes for both instruments at bar 30, as if reaching an arrival point. The action then continues with six repetitions of this pattern, providing some brief stability from the constant mutation of cells.

Ten. Sax.

B. Tbn.

Ten. Sax.

B. Tbn.

Ten. Sax.

B. Tbn.

Ten. Sax.

B. Tbn.

Example 4: pitch change during *In the Loop*

The method of introducing new pitches throughout the piece contributes to these ebbs and flows in the rate of evolution. *In the Loop* uses a relatively small collection of pitches which gradually accumulate over time before being recycled in different formations throughout the piece. Together with the short repeating pattern, the small

pitch collection limits transformation within a few parameters. For much of the preceding material before bar 30, small groups of pitches are used to emphasise the changing intervallic relation between the saxophone and trombone. Pitch choice is influenced by the contour of motion and accentuation outlined by intervallic movement.

The shifting position of the stressed beats is important in governing *In The Loop*'s intensity; they infer constant change in the profile of the rhythmic cell. The stressed strikes within this nine-beat cycle do not remain consistent and are therefore likely to destabilise rhythmic understanding of the pattern; the players have to adapt by constantly counting the pattern in different ways each time this happens. This emphasises the requirement of acute focus towards rhythmic timing in these high-octane rhythmic pieces. Simon Frith underlines the importance of such rhythmic decision-making during performance:

‘The point here seems so obvious that it’s surprising that it still has to be made: musical rhythm is as much a mental as physical matter; deciding *when* to play a note is as much a matter of thought as deciding *what* note to play (and, in practice, such decisions are anyway not separable).’⁴⁷

This highlights the significance of considering how rhythmic action is carried out during performance. It has relevance for my practice in considering the way that performers are asked to engage with my scores rhythmically, considering decisions of ‘when to play’ as a significant factor in my thinking. During *In the Loop*, there are fleeting changes of stressed beats, meaning that the players need to constantly understand the pattern in new ways. Constant rhythmic instability means that the challenge of ‘when to play’ is often a dominant aspect of the performers’ experience. In regard to my pieces in general, I am referring to gradually mutating patterns, cells or grooves which shift their relation to pulse, asking performers to constantly adapt to rhythmical changes.

For *In the Loop*, the concentration needed to perform the composition is important; the heightened alertness to time rhythmic coordination is almost unrelenting. These qualities contribute prominently to my compositional thought, and to the qualities of performance. *In the Loop* gives transparency to the decision-making processes in interpreting this type of score; the piece requires heightened sensitivity to the placement of strikes, and acute attention to the relation between prescribed actions in the score and their physical manifestation. At the same time, details of the pitch and quality of sound

⁴⁷ Simon Frith, ‘Rhythm: Race, Sex, and the Body’, *Performing Rites: Evaluating Popular Music* (Oxford and New York: 1996), 132.

are also changing, either in regard to dynamics, register or articulation. The intent is not to display virtuosity for its own sake. In all of my ensemble compositions, performance is rarely, or perhaps never, soloistic, with the emphasis being on a collective effort. Difficulty generally results from the adaptation of a small number of materials, such as limited pitch groups or numerous related sets of rhythmic patterns.

The constant reworking of coordination is important in building friction between the two players, as their composed parts shift their rhythmic relationship throughout the piece. The success of this is not only reliant on physical prowess and drama, but is a combination of the composed, idiosyncratic shifts in accentuation and the act of creating these rhythmic changes in performance. Even though some elements of the music are highly repetitive, few actions are repeated exactly, and each rendition of the pattern is an adaptation of previous events, within a changing context.

For John Blacking, action and motion are crucial in understanding practices of West African drumming, stating that ‘rhythm describes not a sound but the *making of a sound*, the relationship with a “non-sound,” the hand being lifted as well as the hand coming down on the drum skin.’⁴⁸ Blacking’s description of action includes corporeal motion, which I regard to be intertwined in a multifaceted process of decision-making and communication. We may accept that in describing a rhythm we are always describing a number of actions, or the relationships between actions (even if those actions are not what we would typically consider to be rhythmic).

Action does not only refer to physical movement. Rhythmic actions involve giving and responding to signals and cues, or choosing and timing when/how to act; this concerns one’s relation to other players and to the compositional parameters that I have devised (e.g. metre, accentuation, volume, pitch etc.). It involves a multilevelled system of communication between the players, and between the players and the notated activity in the score; actions are played out within this system of communication. This applies to the conscious decisions of larger-scale planned strategies for interaction, as well as to moment-to-moment negotiations between players.

For *In the Loop*, and the other pieces in this portfolio, this process involves a constant negotiation between the composed rhythmic patterns, individual realisation of the notation, and communication between players as they coordinate their sounds. This process can be said to be a characteristic of many types of scored musics. My intent is to emphasise the heightened nature of this process in my music, since this cycle of interaction is constantly evolving, bringing with it a continual need to adapt an

⁴⁸ Simon Frith, *Performing Rites*, 141.

understanding of the notated rhythms and one's relationship to their instrument and their fellow players; this comes with an ever-changing series of actions and interactions. The thinking of Peter Nelson underlines several important aspects of the connections between rhythm and interpersonal relationships:

‘In rhythms, we hear relationships being played out, not symbolically in Wagnerian leitmotifs, but actually: between one player and another, between each player and their instrument.’⁴⁹

By emphasising the fact that relationships are ‘played out’, Nelson shows that this statement also applies in pieces which have a pre-composed pathway. This is of course channelled by the content of the score, yet this still involves a process of creating and actualising these relationships in real time. As the varying success of performances of my compositions makes clear, the characteristics of such played out relationships can vary widely; they are absent in the score alone. These relationships have particular qualities of social interaction. Here I refer to the manner in which my notated ideas channel an interaction which emphasises, even pressurises, the timing of one’s entry and release of sound in relation to others.

The configuration of interlocking parts imbues this coordination of timing with particular qualities. The specific nature of these qualities differs from piece to piece. In general, one characteristic is the collective challenge of coordinating parts, which is necessary to progress through the score. As many of the ideas rely on interlocking parts, one’s individual part needs the actions of others to realise the musical idea. Coupled with this is the fact that in many pieces, the absence of a clear or consistent downbeat means that strong or stressed beats within individual parts come at different times within the pattern or metric unit. Therefore interaction is often shaped by a tension between collectivism and implied competitiveness in instances where the musicians have conflicting relationships to pulse and metre. This is framed by my decisions in regard to sound, texture and gesture which accentuate the notion of divisions or unities within the ensemble. I will shortly explore these qualities in more detail in regard to *In the Loop*. As the outcome, trajectory and sounds are predetermined, qualities of social competitiveness are implied and encoded into the score. However, this predetermination of events also importantly impacts on the characteristics of inter-player relationships, instilling them with heightened energy.

⁴⁹ Peter, Nelson, ‘Some Aspects of Rhythm’ [unpublished draft article], http://www.academia.edu/288249/Some_Aspects_of_Rhythm, [accessed 31/01/2011],14.

Nelson's notes on 'Aspects of Rhythm' have helped to hone my thinking about the impact of turbulence and constant changes in rhythmic coordination. This is particularly relevant to *In the Loop*, *Hurdling*, *Hide and Seek* and *Zeta Potential*. Nelson discusses the social aspects of counter-intuitive rhythmic coordination in scored music, reflecting on his friend's anecdote of rehearsing a piece by Iannis Xenakis. In rehearsal, the violinist and pianist believed their performance of the rhythm to be wrong, even though it was correct. Nelson suggests that this was because of the unintuitive and unusual results in rhythmic coordination:

'It is not necessarily hard to play or coordinate such rhythms as alignments. It is hard to play them as social agreements. The moments where the beat is a sign come in different places in the different parts. The differences are disorientating for the performers, who want to be together, and this says something about the normal possibilities for negotiating rhythmic relationships in a particular cultural setting. Complex rhythmic parts are difficult to master, but if the ethos is *coincidence-* even at irregular places- the social interrelations are different to where each part makes a space for the other to inhabit with its own regularities.'⁵⁰

This highlights that it is not always or not only the difficulty of individual rhythmic parts which create unstable negotiations of coordination, but the way that these parts relate to each other and the characteristics of interpersonal interaction. In my compositions, the characteristics of rhythmic relationships are very often changing, which intensifies this sense of 'disorientating' interaction; the 'social interrelations' constantly evolve.

How then do the notated rhythms impact on the relationship between the players in the process of performing and rehearsing *In the Loop*? In rehearsals of the piece, the inconsistency of stressed beats underpinned an unstable relation to pulse for both Sanders and myself. The intent, and the effect I hear in the recording, is for pressurised actions to give rise to strained, broken tones as the momentum of the activity leads us to 'snatch' at notes; clearly this would vary from musician to musician in consideration of technical skill, corresponding to the level of effort demanded by the piece. If we consider the recording, it seems to me that our relation to the beat most often fell into the area of anticipative hits which push forward, or quite lethargic movements which cause momentary lags in pace. This owes both to the changing organisation of the pattern and demands of physical stamina, as well as our attempts to collectively negotiate pace and maintain coordination.

⁵⁰ Peter Nelson 'Some Aspects of Rhythm', 9-10.

In the recording of *In the Loop*, the speed is not entirely steady for the duration of the piece, as communication wavers at some points. At least in this piece, I find the human idiosyncrasies and what they reveal of this specific rhythmic relationship appealing. Our rehearsals of this piece made us increasingly aware of the way that we depended on each other's physical gestures to sustain synchronisation. However, the challenges of working out timing between the duo also emphasises that the idea of rhythm as action goes beyond the physical aspects of performance. In preparing this piece with Sanders, we became aware of and adapted the communications which informed our performance. This included visual, structural signals in the score, cues arising from physical movement and the facial expressions exchanged between us. Much of our collaborative discussions involved adapting to and developing a particular system of communication.

The aspects of communication discussed above highlight the notion of 'gameplay' during performance, an idea which has become increasingly important to my small-ensemble work. Rhythm-as-action is pertinent to the 'game-like', social interplay of *In the Loop*; this is pertinent to the performers' communication of alternating strikes in a tightly-coordinated manner. This alternation creates a pattern of events in which each person takes turns at instigating a response from the other. The players are caught in a cycle of provocation and reaction as each new entry depends on the cue of the directly preceding note. These actions are limited because the course of the piece is predetermined; this prescription of events through the score channels the players towards a type of interaction which may be unlikely to occur by other means.

For this composition, the musicians must develop a unified focus, yet they are often placed in pseudo-competitive roles since the rhythmic interaction causes the musicians to alternate rapidly, building increasing pressure to keep up with each other. The duo ambiguously swing between a shared mentality directed towards achieving rhythmic synchronicity, and pseudo-competitive roles as they predominantly play alternately. The trombone and saxophone blend in the middle register, before asserting the contrasting aspects of their 'voices' by leaping to registral extremes. The composition is based upon shifts in the strength of this 'magnetic' pull and tension between the parts.

This somewhat competitive relationship is intertwined with the quality of interdependence in the challenge of collectively maintaining momentum. The predetermined score provides potential to fuel and sustain a flow of mutating rhythmic relationships. Each player is challenged to keep up with the building momentum which

they themselves set in motion. This became apparent in rehearsals, where continually intense concentration often resulted in hilarity at the challenges of coordination. Obviously this is partly due to a personal friendship, but it highlighted the playful aspects which arose out of the challenge of rhythmic coordination. The listener may perceive this interaction in an entirely different way, however this discussion aims to underline the importance of the nature of the musicians' interaction in producing the piece. *In the Loop* reveals the way that the compositional concept is closely tied to the characteristics of performance. This includes my abstract compositional ideas, the qualities of performers' corporeal actions and adaptation of rhythmic understanding, and the interpersonal interactions framed by these factors. Therefore the qualities of performance are important to my compositional thinking, not only peripheral features of the music.

An important precedent for me has been Mauricio Kagel's *Match* (1964). In this piece, the music performed by the two cellists is composed around the idea of a competitive tennis match, during which the percussionist's part is akin to that of an umpire. Some aspects of the performance directly refer to features of playing tennis, including the layout of the two cellists at opposite ends of the stage. However, the elements of competitiveness arise not from elaborate theatrical choreography, but primarily from the interactions channelled by the cellists' alternating musical actions, which encompass increasingly difficult instrumental feats.⁵¹

In Björn Heile's words, 'These actions are for the most part integrated into the playing of the instrument... [the performers] do not interrupt their playing in order to act as athletes, but their playing itself is reminiscent of a sporting competition...musical performance and theatrical effect do not represent distinct levels but constitute an integral unity.'⁵² There is a commonality between the dual challenge of *In the Loop* and Kagel's thinking in *Match*, where the nature of the score's prescribed content channels a particular chain of developing relationships, drawing attention to the social dynamics of the players. Both the increasing difficulty of 'instrumental feats' and the interplay between the performers are central aspects of Kagel's compositional idea.

I have given this attention to *In the Loop* to demonstrate how social interaction, and the turbulence of inter-player communication have grown in importance in my practice. This emphasises that inter-player relationships, as channelled by actions

⁵¹ Joe Cutler's *Ping!* (2012) for string quartet and four table tennis players is a recent example of another composition which draws parallels between aspects of musical performance and sport. *Ping!* focuses on abruptly shifting rhythmic patterns which correspond to practise drills in table tennis. *Ping!* involves both the musicians and athletes in the performance.

⁵² Björn Heile, *The Music of Mauricio Kagel* (Aldergate: Ashgate, 2006), 47.

predetermined in the score, are a significant creative force, particularly in the later pieces of the portfolio.

Qualities of Task and Gameplay

The processes of composing and performing *In the Loop* exposed the ideas of task and game as increasingly important concepts in my music. These experiences stimulated a growing interest in the concept of failure, instigated by the blips of rhythmic coordination mentioned in regard to the unstable pace of the performance of *In the Loop*. My use of the terms ‘task’, ‘game’ and ‘failure’ need unpacking. For *In the Loop*, I feel that a certain amount of irregularity in pace and in the tone of the instruments does not harm the effect of the piece, and in some moments contributes positively to it. These reveal certain ‘failures’ in communication between the players, in the sense that there are deviations from the notated parts and problematic coordinations between the performers. These moments accentuate the sense of task in the duo’s challenge to maintain coordination and momentum, and do not harm the sonic intentions I had for the piece. However, there is a degree to which ‘failure’ can be successful for *In the Loop*; I feel that something like a lengthy pause in activity, or a significant change to the notated rhythmic pattern would be ineffective.

On the other hand, in the recording of *Lachrimae*, blips in communication do not have the same positive effect as those for *In the Loop*, since they significantly jeopardise the predetermined sequence of events and sounds in the composition. I am referring for example to passages in which the ensemble lose coordination and depart significantly from the score, such as between 1:38-2:22 (bars 36-56), 6:52-7:28 (bars 220-234) and 9:52-10:19 minutes (bars 293-305) in the recording. As the performance of *In the Loop* is seen through with zeal, even in problematic moments, the overall effect and sonic ideas are not hindered. This is unlike the performance of *Lachrimae*, in which the lack of conviction in the moments of messiness mean that the ethos of the performance and composition are at odds. Other passages in *Lachrimae* are performed with much more conviction; I am referring to specific points of uncertainty in the performance. These moments are ineffective in the piece in and of itself, as they clearly sound like mistakes. In a piece which works audibly depends on accurately coordinated

parts, chaotic moments do not contribute positively throughout the duration of the piece and manner of presenting the performance.

However, taken alone and in isolation of the rest of the piece, I became interested in the desynchronised moments of *Lachrimae*, and the players' process of gradually migrating back towards the events of the score, and to understand where their fellow players are in the score. There are other similar moments in the second half of *Carousel*. It led me to think about composing pieces or creating frameworks for performance based around this idea of building and collapsing rhythmic coordination; my idea was to focus on the very process of negotiating rhythmic coordination, in cases where it would not be predetermined by the notation. This interest developed alongside the increasing importance of ideas about gameplay and social interplay, which emanated from pieces such as *In the Loop* and *Mechannequin*.

For *In the Loop*, the sense of gameplay arises from the simultaneous tension between the duo's need to communicate effectively, and the competitive quality which arises from the repeated alternation between saxophone and trombone entries. This is accentuated in passages in which the players trade powerful strikes in the extremes of instrumental register. It is not a game-piece, as the outcome is already predetermined, but this playful interpersonal interaction is channelled by the composition's changing patterns of accentuation.

For *In the Loop*, the idea of 'task' is connected to this game-like ethos; the task is to stay together and maintain coordination, which is a prominent feature of the performance because the achievement of the task is so pressurised. In general, this idea of 'task' is connected to the cycle of 'repeat, evolve, adapt'. It involves the process of remaining alert to the changing instructions represented in the notation, and continually being ready to adapt. As the element of risk in the performances of the compositions is significant, the risk of a collapse of synchronisation is often prominent. This gives the fulfilment of the changing patterns a sense of achievement, of completing a task. The progressive nature of chain-like transformations contributes to the impression that keeping up with rhythmic dynamism is a type of task. This is often accentuated by static, or slowly transforming pitch environments, which focus the ear on the rhythmic displacement, or metric instability. We can see the role of 'tasks' and game-like interaction perhaps most clearly in the examples of *Hurdling* and *Hide and Seek*.

Qualities of ‘task’ and ‘game’ in *Hurdling* and *Hide and Seek*

In the composition of these two short pieces, I consciously framed the parts of the players around interactions which have qualities of gameplay or task. These pieces place importance on the individual’s role within the group, and the manner in which this role changes throughout the music. The overall focus of these works concerns the potential for the score to heighten players’ awareness of pressurised actions taken during the performance. I consider this to impact on both the qualities of sound and the dynamic of the ensemble.

Hurdling was written for the Notos Quartet who are based in Frankfurt.⁵³ The ensemble invited composers from Newcastle University to write a short encore piece for the Northern Chords Festival at the Sage Gateshead 2012. This piece plays with a series of mini encores, or multiple ‘endings’ which present hyperactive rhythmic challenges exploring the idea of sustaining and collapsing unison. The idea was to compose a series of short miniatures, each of which could sound like a potential ending. I aimed to present a type of continually resurfacing material, with the players working through a collection of would-be climaxes. The title relates to the notion of ‘task’, as it refers to overcoming a series of obstacles, realised in *Hurdling* as a set of short game-like challenges dealing with this idea of unison. The name also relates to the athletic quality of the material, especially because of the angular movement throughout much of the music.

I regard the piece as game-like because it involves the players in collective or pseudo-competitive pursuits towards achieving a new rhythmic relationship or sustaining their present state under intensifying circumstances. *Hurdling* is not a ‘game piece’, however my hope is that the nature of the composed material will instil this game-like character in the players’ performance. The piece aims to bring to the fore the musicians’ negotiation of actions and of rhythmic sequences. In this sense the idea of game was important to the ideas that I composed, and to the performers’ preparation and performance of the piece.

The first four bars introduce a high-momentum, unison succession of pitches which rapidly descend. In bar 8, a fuller version of the first four bars is introduced, which gradually moves through quaver and dotted-quaver alternations in preparation for the 5/8 and 6/8 oscillations at B. As this rhythmic activity becomes more complex for the players to count, the task of keeping in-time becomes increasingly difficult, which

⁵³ See *Notos Quartet*, http://www.notosquartett.de/Notos_Quartett_-_news_2.html (accessed 01/06/2012).

brings with it disintegration into a rhythmic morass; the task-like element is the challenge to maintain coordination. The Notos Quartet were highly skilled readers and performers and de-synchronised at letter D, bar 33, where the change is marked, however an accidental de-synchronisation before this point would also be an effective realisation of this idea.

Bars 1-7: unison, straight quaver beat

A musical score for a single instrument, likely a woodwind or brass instrument. It consists of two staves. The first staff begins with a treble clef, a key signature of one sharp (F#), and a common time signature (4/4). The second staff begins with a bass clef and a common time signature (4/4). Both staves feature a series of eighth-note patterns. The first staff has a pattern of eighth notes followed by a sixteenth note, repeated four times. The second staff has a similar pattern of eighth notes followed by a sixteenth note, also repeated four times. The music concludes with a final measure ending in common time (4/4).

23 unison; arrival at 'goal' of rhythmic process;
alternation of 6/8 & 5/8

unison lost; the resulting rhythm from new
31 rhythmic layers:

33 Collapse of synchronisation

A musical score for four instruments: Violin (Vln.), Viola (Vla.), Cello (Vc.), and Piano (Pno.). The score consists of four staves. Each staff begins with a double bar line followed by a repeat sign. The Violin, Viola, and Cello play eighth notes on the A string (the fifth line from the bottom). The Piano plays eighth notes on the D string (the fourth line from the bottom). The notes are grouped by vertical bar lines.

Measure	Vln.	Vla.	Vc.	Pno.
1	—	—	—	—
2	●	●	●	●
3	—	—	—	—
4	—	—	—	—
5	—	—	—	—
6	—	—	—	—
7	—	—	—	—
8	—	—	—	—
9	—	—	—	—
10	—	—	—	—
11	—	—	—	—
12	—	—	—	—
13	—	—	—	—
14	—	—	—	—
15	—	—	—	—
16	—	—	—	—
17	—	—	—	—
18	—	—	—	—
19	—	—	—	—
20	—	—	—	—
21	—	—	—	—
22	—	—	—	—
23	—	—	—	—
24	—	—	—	—
25	—	—	—	—
26	—	—	—	—
27	—	—	—	—
28	—	—	—	—
29	—	—	—	—
30	—	—	—	—
31	—	—	—	—
32	—	—	—	—
33	—	—	—	—
34	—	—	—	—
35	—	—	—	—
36	—	—	—	—
37	—	—	—	—
38	—	—	—	—
39	—	—	—	—
40	—	—	—	—
41	—	—	—	—
42	—	—	—	—
43	—	—	—	—
44	—	—	—	—
45	—	—	—	—
46	—	—	—	—
47	—	—	—	—
48	—	—	—	—
49	—	—	—	—
50	—	—	—	—
51	—	—	—	—
52	—	—	—	—
53	—	—	—	—
54	—	—	—	—
55	—	—	—	—
56	—	—	—	—
57	—	—	—	—
58	—	—	—	—
59	—	—	—	—
60	—	—	—	—
61	—	—	—	—
62	—	—	—	—
63	—	—	—	—
64	—	—	—	—
65	—	—	—	—
66	—	—	—	—
67	—	—	—	—
68	—	—	—	—
69	—	—	—	—
70	—	—	—	—
71	—	—	—	—
72	—	—	—	—
73	—	—	—	—
74	—	—	—	—
75	—	—	—	—
76	—	—	—	—
77	—	—	—	—
78	—	—	—	—
79	—	—	—	—
80	—	—	—	—
81	—	—	—	—
82	—	—	—	—
83	—	—	—	—
84	—	—	—	—
85	—	—	—	—
86	—	—	—	—
87	—	—	—	—
88	—	—	—	—
89	—	—	—	—
90	—	—	—	—
91	—	—	—	—
92	—	—	—	—
93	—	—	—	—
94	—	—	—	—
95	—	—	—	—
96	—	—	—	—
97	—	—	—	—
98	—	—	—	—
99	—	—	—	—
100	—	—	—	—

Example 5: summary of rhythmic changes through *Hurdling*

From G-J: attaining unison

37

Vln.

Vla.

Vc.

Pno.

'anticipation' of pno.

ricochet

'ripple': staggered ricochet entries shadow pno.

53 ricochet replaced with gestural material anticipation increased

71 anticipation & shadow of pno. become more rapid/shorter

Vln.

Vla.

Vc.

Pno.

82 anticipation & shadow are reduced

unison

Vln.

Vla.

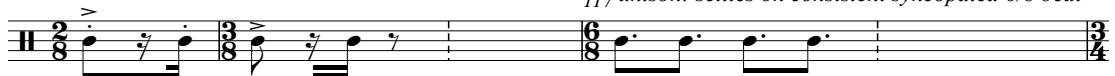
Vc.

Pno.

Example 5 continued

Bars 88-123

88 unison: alternating 2/8 & 3/8 (recurring 2+3 idea) 117 unison: settles on consistent syncopated 6/8 beat



Bars 126-136

126 *> ricochet* plays with shadowing technique from G-J

Bars 137-172: disorder from unison

137 Unison: (recurring 2+3 idea) 151 Cello parts slip out of unison 169: exchanges become more rapid 171: exchanges now unmetered

Pno.

173 Bar 173: Musicians play without regard to others

177 Bars 177-end
strings in unison; pno. gives clear downbeat

Example 5 continued

Each section of the piece has in common near-consistent momentum and trajectories which move to or away from stable patterns. As mentioned above, this was influenced by attempts to associate unison rhythm with a type of achievement; synchronisation is challenged by composing turbulent pathways towards the attainment of coordinated parts. Sometimes this is realised in sustained unison activity which is pressurised due to rapidly changing rhythmic patterns, such as between letters A to D. At other times, such as between G and J, the ‘task’ is the attainment of unison, with the challenge lying in the continual replacement of rhythmic units with other, subtly different cells. The ‘task’ is to differentiate between changes within a graded process which moves from ever-changing, slightly staggered entries towards landing on the beat in unison. In contrast to movements to and from unison, during M to Q, the rhythmic patterns organise the cellist and pianist to avoid each other. This intensifies with the four musicians disregarding the parts of the other players at P’s race; each performer concentrates only

on completing their own part as rapidly as possible. *Hurdling* involves each performer in different relationships with fellow players throughout the piece.

Hide and Seek was written as a submission for duoDorT's project Maché, which called for short composition 'strands' which would later be compiled into a double piano concerto.⁵⁴ duoDorT includes the two pianists Kate Halsall and Semra Kurutaç, who are highly active performers of a wide range of contemporary music. For their brief, I decided to write an exploration of oscillatory power relationships between the duo, presenting alternating roles between the pianists in several short sections. The opening of the piece aims to introduce the idea of different power relationships between the duo. An ascending glissando up the piano's bass strings creates a powerful wash of sound to begin the piece. In response, the second pianist cycles quickly around a sequence of pitches whilst trying to sound inconspicuous. The idea is that Piano 2 becomes active when hidden or obscured by the shadow of Piano 1's strike. This instigated the concept of 'hide and seek' as a means to explore the fluctuating roles I had in mind.

At times, the two players have to follow different sets of rules, each of them coordinating their actions in response to different information. There is still a substantial amount of mutual agreement, especially as the piece goes on; both players are aware of the instructions given to their fellow pianist, and the piece requires rehearsal. However in performance, the score channels the two musicians into interactions which off-set them from each other, both in conventionally scored passages and in the spatially notated opening of the piece. This requires understanding of what the other person is playing, while also working to supersede those actions, albeit through a predetermined score. The precedent is set for this in the opening, where Player 1 counts (or uses a stop watch if preferred) for a specified duration of time before pausing, whilst Player 2 reacts only in response to the sound from Player 1, immediately stopping when Piano 1 is silent. Rather than react to their partner, Player 1 progresses according to their own plan.

Therefore at times, the players are given different tasks in which specific instructions force a particular relationship with the other player; this instructional element means that relationships are formed by realising the prescribed actions set by the task. For example, in bar 1 of *Hide and Seek*, the players' parts clearly have different functions: to dominate; to hide by playing passages which are inconspicuous;

⁵⁴ *Hide and Seek* was selected for Maché this and is currently being developed alongside other compositions by duoDorT.

to run through a set of pitches before becoming exposed. Of course, these roles are composed-out, and so the game-like quality is implicit rather than open to play out to an undetermined ending. Other passages use hocket-like techniques to create variety in the distribution of repetitive patterns, causing changing rhythmic relationships and varying cueing patterns. We can see this for example in bars 43-87, in which a riff is distributed between the pianists in several different ways. This is coupled by a slight lengthening and shortening of the riff by one quaver beat, to create an off-kilter effect.

Genesis of rhythmic idea for riff

Resulting ostinato

J First appearance of ostinato at J, bar 66

Pno. 1

J Pno. 2

Unstable pattern: ostinato explored in these versions to give an 'off-kilter' effect
(e.g. bar 69 onwards)

69 Pno. 1 + ♫ (original) - ♫

Pno. 2 + ♫ - ♫

Example 6: ostinato from *Hide and Seek*

Both *Hurdling* and *Hide and Seek* use qualities of task and game as significant aspects of the compositional process and ethos of performance. These relationships and actions

need to be played out and created in real time; they are absent in the score alone. *Hurdling* and *Hide and Seek* were among the last few pieces to be composed. They reflect the way that my decisions in regard to rhythm and sound have become importantly intertwined with strategies focusing on ensemble dynamics.

Graphic Scores

I have previously discussed the significance of challenge and risk, particularly in regard to sustaining long passages of energy-intensive, evolving rhythms and inter-ensemble relationships. I argue that this is a very significant aspect of the music, both in its composition and performance. It is the threat of failure, rather than the occurrence of calamity in itself, that is important to these fully-notated pieces; a central aim of the performance of these scores is to play out the sounds, rhythms and events detailed in the notation. However, alongside these compositions, my work with graphic scores represents another way in which I have approached the ideas of task and gameplay in musical performance. I will shortly discuss this work in more detail, however first I give a precursor to some of the ideas that informed this work.

I have discussed the growing importance of the social interaction between players in my compositions. This centres around the way that changes, for example, in the distribution of an interlocking rhythmic pattern, or shifts in the pattern's relation to pulse, cause performers to play out changing relationships. I wanted to isolate and further explore such situations revolving around social interaction. For this, it seemed necessary to use a different type of visual stimuli to shape such interaction, rather than prescribe it entirely. This would give players choice and greater responsibilities regarding how these relationships evolve.

In my experimentation with graphic notation, my intent was to provide musicians with blueprints for actions framed by visually repetitive patterns. I thought that this could give players a more dynamic role in negotiating rhythm and perhaps loosen the limitation of collaborating only with musicians who are extremely proficient at reading notation. I feel that a broadening of the scope of people with whom I may collaborate would be beneficial for some of these ideas. This could potentially bring opportunities to focus on the social interactions involved in the real-time negotiation of rhythm in notated frameworks. A greater emphasis on the process of building repetitive

patterns in real-time could feed into musical interactions in which ‘failures’ could become equally valid, playful aspects of compositions as well-oiled synchronous rhythmic relationships. Perhaps fluctuations between broken and coordinated rhythmic communication could become valid or productive aspects of the music. The thinking of Cornelius Cardew has contributed to my consideration of this issue:

‘Failure is an interesting topic....Nature has no goals and so can’t fail. Humans have goals and so they have to fail. Often the wonderful configurations produced by failure reveal the pettiness of the goals. Of course we have to go on striving for success, otherwise we could not genuinely fail. If Buster Keaton wasn’t genuinely trying to put up his house it wouldn’t be funny when it falls down on him.’⁵⁵

Cardew’s reflections propose that failure of a certain kind can have a productive quality in performance. The ‘wonderful configurations’ can be regarded as the processes of human interactions and what they give rise to, as set in motion by a goal. We see this in several of Cardew’s scores, for example in Paragraph 7 of *The Great Learning*, in which players must assimilate and remember the complex rules of the piece while following the text-score. This disciplined task is aimed to stimulate acute interpersonal listening. The core principles are the emphasis placed on listening environment, the weight given to performers’ choices and decision-making, and the construction of score-as-task. When Paragraph 7 is approached with dedicated intent, the required alertness and the possibilities for non-disastrous failure provide the tension which the performance thrives upon. John Tilbury points towards the ambiguous features of Cardew’s scores as influential to the mindset during performance: ‘All these are psychological obscurities directed at the player in the hope of waking him up’.⁵⁶

Saxophonist Anthony Braxton provides strong precedents for stimulating agile aural awareness among players in strategies for maintaining fresh and dynamic group interaction. The North American’s prolific catalogue of music is an exemplar of different strategies for ‘psychologising’ the rhythmic interactions between players.⁵⁷ Braxton’s practice consists of improvisations, compositions and performances which mix improvisational and compositional practices. This is exonerated in Braxton’s quartet with Marilyn Crispell, Gerry Hemingway and Mark Dresser in the 1980s and

⁵⁵ Cornelius Cardew in John Tilbury, *Cornelius Cardew (1936-1981): A Life Unfinished* (Essex: Copula, 2008), 469.

⁵⁶ *Ibid.*, 245.

⁵⁷ The scope of Braxton’s work goes far beyond aspects of rhythm, however I focus on this for its relevance to my own work.

early 1990s. Braxton, as well as the members of his quartet, has been eager to emphasise the interpersonal impacts of his strategies amongst fellow musicians. Braxton's pulse track system uses a horizontal notated layer which prescribes specific, but non-metric rhythms which appear periodically, functioning as a recurrent anchor amidst other activity. These pulse cycles have been of particular interest to me in their potential for shifts between independent rhythmic action, rhythmic interaction between players and the holistic rhythmic direction of the group. According to Braxton,

‘these horizontal variables establish a dialogue, on the first level between the individual and the process; then the individual and the other players; and later the individual and the composite group consciousness.’⁵⁸

This strategy instils the group's changing rhythmic dynamics with tension, giving the players varying roles within the ensemble at different times. I had begun to think similarly about such dynamics in my stave-notated work; independent rhythms; dialogues or implied ‘competitions’ between multiple parts; textural masses which exert certain rhythmic characteristics. These ideas are especially important for *Zeta Potential* which will be considered in detail later. However, Braxton's pulse cycles were most influential to a number of experiments I carried out with graphic scores, which aimed to leave the outcome of these multilevelled rhythmic dynamics open.

Specifically, I considered the construction of processes based on gaining and collapsing coordination, importantly framed by qualities of gameplay. After practical exploration with different notational methods, I began to pursue a type of graphics which would be fairly accessible to a wide range of musicians and which would explore some of the issues discussed above. These graphics frame each player's activity around one of the circular rings in the score, which are arranged in orbital relationships and consist of cyclically-plotted visual gestures (see Figures 1 and 2 in Appendix). This indicates the timing of each player's utterances in relation to the cycle of events plotted for the other musician/s, and scores are followed in a circular motion. A player follows the shapes plotted around their ring, of which the shading and profile can either be left open or fixed to link visual information to parameters of sound. The speed at which the players move through their cycle is unfixed and this requires decision-making from the musicians. During performance, a change in the speed of movement around a cycle will affect the relative speed of the fellow players, requiring the group to re-coordinate their actions in real-time.

⁵⁸ Anthony Braxton in Graham Lock, *Forces in Motion: The Music and Thoughts of Anthony Braxton* (New York: De Capo Press, c1988), 196.

In these graphic scores, I aimed to explore how patterns can transform through social interaction, framed by a game-like situation. They have the same ‘game-like’ ethos of the rhythmic challenges of *Hurdling* or *Hide and Seek*, yet players are freed from the responsibility of counting intricate rhythms, or metre. Instead, players are given the responsibility of negotiating the relative durations of the visual gestures with the attitude and sounds of their fellow musicians.⁵⁹ Therefore, the concept behind these graphics is linked to my stave-notated scores, as it still involves using visual material to produce acute focus towards repetitive exchanges between players. However, in these traditionally notated pieces, it is the *threat* of failure that is important, rather than potential for real breakdowns and failures in communication to contribute positively in the music. In the graphic scores, moments of confusion in coordination need not always be resolved by rhythmic agreement; this differs to my stave notated compositions. This is framed by a quality of gameplay, which incites players to experiment and push the social agreements negotiated during performance.

The graphics are designed to colour either improvisations or more pre-determined interpretations with this quality of gameplay; changes in speed or movement to a new ‘circle-set’ require participants to reconfigure rhythmic relationships. These graphic scores investigate the rhythmic qualities of actions and events arising from interpersonal and score-based signals. They explore how repetitive flows of motion generated by the graphics may drive musical-social exchanges in improvisation, or graphically-framed compositions. One interest in these circular graphic scores is the state of concentration this task can induce. Rules define certain features of this interaction, however the graphics also require the players to make decisions. These choices revolve around the way in which they relate to the playing of their fellow performers; do they take the lead? Provoke aggressive exchanges by upsetting the speed of the rhythmic cycle? Facilitate change? Choose sounds which overpower or complement those of others? Prioritise consistency or aim to surprise?

An important quality of these scores is the potential for communicative failure that they hold. I do not mean failure in the sense of an aesthetically displeasing result. Rather, if players end up in fraught rhythmic exchanges where communication breaks down, this need not result in musical calamity. In this context, I consider failure to be musical interactions which involve confusion, lack of agreement or forced departures from the score. Such events are regarded to potentially contribute productively in

⁵⁹ There are several moments in George Crumb’s scores where cyclical arrangements of scored materials are used amidst other types of notation e.g. *Black Angels*. Circular scores were also used by Tōru Takemitsu in works such as *Ring*, *Corona for pianist(s)* and *Corona for violinist(s)*.

performance, as these power dynamics are inherently important to the scores and musical ideas. The scores pose tasks which the players need to solve to make this blueprint musically interesting. Since the focus of these performances is weighted so heavily on retaining or evolving rhythmic patterns, moments of collapse and reformation can become valuable and interesting parts of performance. I believe the potential for this has been shown in some of these preliminary experiments.

Such an instance occurred in the recording included in the Appendix, which was performed by myself, Henrik Frisk and Stefan Östersjö. Towards the mid-end of the performance, Frisk became dislocated from the pattern of events that had developed, and was unable to find a reference point in the score. This friction did not damage the performance, and in my opinion contributed positively. Frisk's departure from the score inevitably forced us to negotiate a way back into the score, causing us to make real-time decisions regarding cueing movement to another circle set, and finding ways to re-synchronise.

I see this research as an important project in its embryonic stage that I am currently continuing to explore and refine. Examples are included in the Appendix because although this project is related to the submitted scores, it takes a significantly different creative approach to the stave-notated scores. I have given space for this discussion in the commentary because it represents one important response to questions raised in this research project and has contributed to my compositional ideas. It also reveals one way in which I will develop the features of gameplay and task which are nascent in the submitted compositions. I aim for future research projects to build on the work that I have begun with these graphic scores. This will revolve around exploring strategies for rhythmic-social interaction as the basis for creating music. It will involve work with frameworks for improvisation or scores which present blueprints for action in a similar manner to these cyclical graphic scores.

Christian Wolff's music is particularly pertinent to my development of these ideas because many of his pieces use notation as a means to channel systems of social interaction. Wolff sums up this focus on social interaction succinctly:

‘Apart from giving individual players ranges of choice in what and how to play, my main interest has been the mutual effects players have on each other in the real time of performance.’⁶⁰

⁶⁰ Christian Wolff, ‘Christian Wolff’, in James Saunders, *Ashgate Research Companion to Experimental Music* (Farnham; Burlington: Ashgate, 2009), 363.

My interest in Wolff's work particularly concerns the cueing systems which feature in many of his works in the 1960s. Though Wolff has used wide-ranging strategies to stimulate musical interaction, one might generalise that his methods of writing contingent scores is centred around instigating a blueprint for actions, a system for interacting which often serves as the departure point for creating sound. The idea of blueprint for action is evident in works which base interplay between performers around interdependent cueing systems. For several of the pieces that Wolff composed in the 1960s, the scores set up systems of interaction which channel the players' decision-making in regard to sound, and their responses and signals to other performers. For these cueing systems, instructional information usually consists of unordered nests of interdependent actions, often regulated by a set of rules or conditions. Through involving oneself in such a system of interaction, where one event impacts on the timing and content of the next event, the score's network of actions channels players to shape their own version of the piece.

Wolff's *Duet I* (1960) for two pianos comprises of an intricate system of coordination. Wolff graphically notates a number of different exchanges between the duo, which indicate how and when a player should enter in response to their fellow pianist; within these indications, the pianists are left with many choices to make.⁶¹ Wolff's notational key for these coordinations details the speed at which one player reacts to another, and how long one's notes should sound for in regard to the preceding or following actions of the other player. It focuses players' attention on the giving and receiving of signals through a system which pressurises attention to one's role in the duo. Each player's entry depends on extremely attentive listening to the sounds, attacks and durations of the other player's notes. Each pianist has a different part and is responsible for their own actions, however the music results from negotiating a collective navigation through the score.

The process of assimilating the instructions of the score's symbols, as well as building this attentive, co-dependent relationship between players, makes for a complicated task. This process therefore takes a substantial amount of time spent familiarising oneself with the work and internalising the rules to be able to understand the notation and perform from it. Philip Thomas gives the example of Wolff's *Duo for Pianists II* (1958) to explore a similar effect in the cueing system in this piece. He cites John Cage's comparison of this piece to catching a train, 'the departures of which have

⁶¹ The performers' pitch choices are represented in traditional notation.

not been announced but which are in the process of being announced. [The performer] must be continually ready to go, alert to the situation, and responsible'.⁶²

At the crux of these pieces is the challenge to negotiate rhythmic exchanges by remaining alert to many different levels of communication. The pianists need to thoroughly understand the system of cueing, be responsive to specific cues, be decisive in reacting to cues. There is then another level of nuance in the choices performers may make regarding how predictable or unpredictable their may wish to be in their actions and reactions within this cueing system.

The highly prescriptive scores I submit here come from a different perspective to Wolff's work. However, such cueing or signalling systems have triggered thoughts of how I may use devices to stimulate very attentive listening between players in my own compositions. For example, in the unmetred sections of *Zeta Potential*, I consider the sensitivity required to time one's own entry in reaction to the action of others to be very important to the musical effect, especially in contrast to the metred passages which bookend this section of the piece. Each musician follows cues from a different person, and the ability of the ensemble to collectively progress through the score depends on each individual's responsiveness to their particular set of cues.⁶³ I am now developing a new project which aims to expand and explore other strategies for cueing networks. This will involve the development of geometrical patterns to plot cueing systems between performers, as well as cueing strategies framed by spatially notated scores using staves.

Such ideas will depend on working with a group of players with whom it is possible to explore different notational strategies. It is important that the context of collaboration offers the space and flexibility to develop these creative ideas. The success of this will involve working with musicians who have a shared interest in the ideas outlined above. It is unlikely that this situation would be possible in the context of working with ensembles embedded within institutions of classical music, as I have done for some of the pieces in this portfolio. These are contexts in which there is little flexibility or time to experiment with the traditional social dynamics within ensembles; it is precisely this experimentation in the dynamics of the group that is necessary for my future development.

⁶² John Cage in Philip Thomas, 'A Prescription for Action', 216.

⁶³ *Zeta Potential* will be discussed in more detail below.

I now move to a discussion of specific pieces which exemplify important technical aspects of my compositional approach, and shed light on pieces which have not yet significantly entered into the discussion.

Mechannequin: playing out rhythmic instability

Mechannequin was written for a workshop with the Ives Ensemble, coming at around the mid-point in the completion of the portfolio. This piece illustrates the way that during this period of the research, the playing out of different types of relationships between performers became significant to my compositional approach. In *Mechannequin*, repetitive evolution and changes in the distribution of patterns impact on the shifting partnerships between performers. This involves an approach to rhythm which is at some points based around metre, and at other times prioritises patterns of accentuation which were not conceived of in terms of metre.

An example of the latter comes between bars 29-105, during which players afford their energy to collectively sustaining interlocking parts anchored by a pattern of accentuation. This accentuation remains consistent throughout, but the gradual subtraction of parts significantly changes the nature of the rhythm and the texture, at times destabilising and eventually displacing the pulse. The ethos is to collectively sustain the pulse throughout the numerous changes to individual parts. This eventually culminates in an emphatic unison ‘arrival’ at bar 87, leaving only the accented beats which have been underlying throughout this passage. This trajectory emphasises the task of collectively staying together and reaching the unison chords at bar 87.

In contrast to this idea of a collective pursuit, from K onwards, the group splits into two halves which must work to sustain their conflicting metres. This involves a gradual process which ‘pulls apart’ the short repeating figure from bar 38, until the ensemble achieves the superimposition of 4/4 and 9/8 metres. In this section of the piece, the confinement of the instruments in a high register couples this metric tension with a persistent abrasiveness and persistence in consistent sounds; the two conflicting groups occupy the same register, using the same pitches and featuring very similar timbres. Whilst the high register is comfortable for some of the instruments, the abrasiveness comes in the collective saturation in the high register, perhaps accentuated by the contrasting breadth of register which is used in the opening of *Mechannequin*. At

N, several players trade semiquaver figures with other performers amidst a shifting pulse; they follow the changing beat of the winds, and alternate their entries with others, meaning that here the focus is an alertness to one's role within the shifting pulse.

Alongside such tension within an individual passage of music, sudden shifts to different organisations of rhythm and texture heighten the pressure. From bar 186 to the end of the piece, the players oscillate between short passages of music which require them to coordinate with each other in quite different ways. In a passage such as bars 290-298, the music is based around a superimposition of the 9/8 beat over a 4/4 beat. As well as the tension in this passage itself, after a brief nine bars of coordinating the superimposed metres, the ensemble have to reconfigure to realise a passage largely in unison, which idiosyncratically changes time signature.

Mechannequin combines gradual processes of rhythmic change with sudden shifts to different sound environments and rhythmic organisation. This trajectory constantly requires players to relate to each other in different ways. Clearly, the pathway of this activity is predetermined, therefore this interaction occurs within very limited parameters. However, these rhythmic changes cause the players to play out changing partnerships and relationships. My compositional choices play with varying qualities of implied collectivism or conflict in the characteristics of rhythm.

Red Charango: the solo piece

This emphasis on inter-ensemble dynamics draws together several important qualities of my compositions. However, the solo piece *Red Charango* provides insight into other aspects of my compositional approach. Without the presence of layered textures and interlocking rhythmic parts, *Red Charango* brings to the fore the turbulence of the player's 'repeat, evolve, adapt' process, both in a performative sense and in terms of the gradual transformation of sounds. There are few moments in which the action rests, as the process of transforming pitch patterns, pulse and playing technique is particularly unrelenting; the performer needs to remain continually alert to adapt to these changes.

In *Red Charango*, the tension between the agents of the performer, the instrument and the score are especially exposed. This is partly because of the fact that there is only one performer, however it is also because of the way that sonic changes are clearly linked to changes in playing technique. For example, between bars 74 to 95,

changes in the three sound categories of *tremolo*, harmonic and chord are accompanied by significant shifts in hand position and technique. Similarly, in the opening, the confinement of activity to a single pitch means that movements in the hand position to reach the chord punctuations are particularly emphatic; this applies both to the sonic interjection of the chord as well as the performer's movement of the hands.

The treatment of the instrument was of particular interest in this piece because at the point of beginning to work on the composition, I was unfamiliar with the charango. The charango is an Andean plucked instrument originating from around 17th and 18th centuries, which developed into a traditional Bolivian folk instrument. This small guitar-like instrument has ten strings grouped in five courses of the same pitch. I was introduced to the instrument early in 2011 in a festival of contemporary guitar music at Newcastle University. Here I heard Agustín Fernández's *Wounded Angel* for charango and tape, performed by Stefan Östersjö, who also plays several other types of guitar. This piece excited my interest in the charango, alongside further listening and conversations with Östersjö about the instrument. I mentioned to Östersjö at this point that I would be interested in composing a charango piece, about which he was enthusiastic. Over the next couple of months I learnt about the instrument in more depth in conversations with Fernández, before beginning to compose *Red Charango* for Östersjö, who was involved in the process of drafting and trialing the piece.⁶⁴

I was particularly keen to work on the piece with Östersjö because he is a highly active performer of wide ranging contemporary music. For this piece, it was important to work with a specialist in new music, and for there to be substantial time for dialogue and experimentation with ideas. Initially, I aimed to use fairly typical charango techniques which would play out within a claustrophobic sound environment. I was compelled to explore such an idea with this relatively small-sized instrument; when performed the charango can appear to be almost cradled. This provided potential to play with the combination of a small instrument with an overflow of transient actions, and I thought this could be effective sonically considering the relatively narrow register of the charango.

My initial thoughts were based around changing patterns of resonance, which meant that the tuning of the open chord was important. The charango's standard C major/A minor open chord tuning did not suit the harmonic environment I had in mind. Since the use of open strings was to be important, I decided to retune the instrument in mind of a chord sequence I had begun to develop. I use this tuning in *Red Charango*:

⁶⁴ We aim to arrange a performance and/or recording of this piece in the near future.

The image shows musical notation for a charango. At the top, two staves are shown: 'Retuned charango' and 'Standard charango tuning'. Both staves have five notes on them, with note 5 at the bottom and note 1 at the top. Below these, a sequence of chords is shown over five bars, labeled 1. through 5. Bar 1 is labeled 'All strings open' and bar 5 is labeled 'All strings closed'. A bracket under the chords indicates a 'Gradually decreasing in resonance with decrease in number of open strings' from bar 1 to bar 5.

Example 7: charango tuning and *Red Charango*'s original chord progression

The five-chord sequence shown in Example 7 is based around a movement from open-stringed chords towards less resonant chords which use stopped strings. The idea of gradual change in resonance occurs most clearly at letter E, bar 61 in the final piece. From bar 61, the reduction in action affords more attention to the resonance of each chord. Following the development of the chord-tremolo-harmonic sequence from F, the music progresses towards a pattern of events structured around these three gestures, framed by growth and retractions in resonance.

From the basic sequence shown in Example 7, I devised a number of permutations on the set, which are summarised in Example 8 below. Set 3 in Example 8 illustrates an incremental process of transposition whereby the transposition interval increases by a semitone for each new chord. Through this approach I developed a 'pool' of pitch material and chords with which to work. My intention with this pool of pitch material was to avoid exact repetition, but create a pitch environment that remains generally consistent. This confines frenetic activity on the charango within a limited set of chords, accentuating the tension of the oscillations in pulse.

Set 1 (for e.g. bars 61-95)

All strings open

1. 2. 3. 4. 5.

Gradually increasing in resonance with increase in number of open strings

All strings closed

Set 2 process (see bars 50-61)

Chords were transposed or alter to feature G#, and then adapted to creative an effective progression

5. → addition of G#, D# 4. → add G# additional notes → prepare next chord; 2T. (transposed up semitone) → onto chord 1.

"Cmin6/Amin2"- "Gmaj" "G#min"- "Cmin/Fmin" ''Emin7''

Set 2 (e.g. bars 50-61; e.g. bars 162-166)

"A" (5.) "B" (5alt.) "C" (4alt.) "D" (2alt.) "E" (1.)

Set 3 (Set 2 with incremental transpositions e.g. 167-172)

"A" (5.) "Bi" (5alt. transposed up semitone) "Ci" (4alt. transposed up tone) "Di" (2alt. transposed up min 3rd) "Ei" (1. transposed up maj 3rd)

Set 4: combination of Set 2 & 3 (see 173-180)

"A" "Bi" "Ci" "Ei" "Ei"

"Eii" ("E" transposed up maj 6th) "D" "Di" "Ai" (A transposed down semitone)

Example 8: chord material for *Red Charango*

Set 5: consolidation/selection of chords from Set 4 (180-184)

Set 6: further consolidation (185-192)

Set 7: basis for monophonic passage (193-224)

5. "Ai" alt. "Ei"

Set 8: new combination, playing with transpositions

Set 9: revisit of Set 1 chords (bars 281-315)

Set 10: rapid alternations (bars 325-358)

A musical score consisting of two measures. Measure 4 starts with a treble clef, a key signature of four sharps, and a '4.' measure number. It contains a single note on the A line. Measure 5 starts with a treble clef, a key signature of one sharp, and a '5.' measure number. It contains a single note on the A line.

Set 10: starting point of pitch material (bars 358-361)

A musical score for piano. The left hand is in the treble clef, B-flat major (two sharps), and the right hand is in the bass clef, C major (no sharps or flats). Measure 5 starts with a G major chord (B, D, G) in the right hand and continues with a G major chord in the left hand. Measure 6 starts with a G major chord in the right hand and continues with a G major chord in the left hand. The page number '5.' is at the bottom left, and the measure number '1' is at the bottom right.

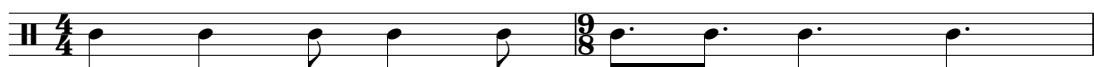
Example 8 continued

In comparison to my earlier compositions, *Red Charango* focuses more intently on approaching specific qualities of timbre as the basis for generating transformational processes in the music. Though pitch material rarely repeats itself exactly, there is a high degree of similarity and staticity in the overall harmonic environment. In listening, this affords more focus to the changing quality of the sounds and the evolving changes in rhythm. I feel that this compositional approach was in part influenced by the process

and challenge of familiarising myself with a previously unknown instrument. This is not to say that questions of sound quality are not significant to the other pieces, and I point out several other instances in which this is important. However, the process of discovering and developing an understanding of the sounds of the charango was a particularly fascinating working process.⁶⁵

In the opening of the piece, subtle differences in the sound quality of different strings gradually introduce the impression of metric alternation. The music gradually asserts an alteration between 4/4 and 9/8, creating a constant tug between duple and triple metres. Initially, these metrical alternations arise through changes in the timbre of the upper string, before fingering patterns are introduced and pitch patterns begin to differentiate between the two pulses. At several moments, particularly from bar 172 until the end, the music explores the oscillating duple-triple pulse in short cellular patterns, which are likely to obscure a clear sense of metre. In fact here, metre is used to communicate the increasingly short rhythmic cells, which were conceived of as patterns in themselves, rather than signifiers of metre.

In a similar manner to *In the Loop*, *Red Charango*'s confined sound environment magnifies the tension of unstable alternations of metre or duple-triple pulse. As for *In the Loop*, the performer is required to remain constantly alert to these slight rhythmic changes within otherwise fairly consistent patterns. Throughout *Red Charango*, the performer is continually challenged to keep up with transformations which lead towards 'arrival points'. These provide fleeting moments of stability, before soon adapting to new rhythmic changes as the music moves towards a new 'arrival point'. K-N involves a gradual process of arriving at the pattern of accentuation shown in Example 9. This pattern is emphasised in the chordal ostinato at N, which after six bars of repetition is on the move again, eventually arriving at the 2/4 and 5/16 oscillations at letter O.



Example 9: rhythmic emphasis between bars 110-171, *Red Charango*

⁶⁵ I borrowed a charango from Fernández during my composition of the piece, and was able to hear my sketches and fully-composed ideas through meeting with Östersjö.

Strings alternate at even pace

Alternate between individual strings in the course
sul tasto

1 ①

mp

Different strings; clearer timbral change

Alternate between single strings (one per course)
① ③ etc.

5

fff mp

Process speeds up, beginning to explore a beat

Alternate single
strings

21

p

(③ ① etc.) (③ ① etc.) (①) (③ ① etc.)

31 String changes follow alternations of metre, bar by bar

(2) (4) (5) (2) (4) (5) (2) (4) (3 ①) (3 ①) (3 ①) (3 ①) (3 ①) (3 ①)

39 Consistent fingering pattern, now with pitch change and contour of leaps outlining beat

(2) (4) (5) (3) (1) (2) (4) (5) (3) (1) (2) (4) (5) (3) (1) (2) (4) (5) (3)

Example 10: development of pitch pattern and fingering pattern, *Red Charango*

These motoric chains of transformation accentuate a sense of risk, as any break in the performer's activity disrupts the constant figurations, or the binding alternations of metre or pulse. The piece is entirely playable, and was developed alongside advice from Östersjö. However, the task of keeping these claustrophobic chains of transformation in

motion creates a heightened intensity, which centres around the performer's negotiation of a constantly shifting rhythmic complex.

Red Charango exemplifies the way that these transformations of local rhythmic characteristics, such as moment-to-moment metrical shifts or evolutions of short patterns, are framed by large-scale processes in terms of the evolution of sounds and the pace of events. We can see this in the movement to and away from 'arrival points', or movement through different permutations of the pitch material, for example. These characteristics demonstrate the interconnectedness between choices of sound, the global pacing of events and local pattern-based activity in my compositional approach. I turn to the examples of *Bungee* followed by *Lachrimae* and *Carousel*, to further explore these characteristics.

Bungee

Bungee was the second piece to be composed, and it was written for a workshop with Northern Sinfonia, overseen by Peter Wiegold and David Lang. For this piece, my compositional approach was dominated by ideas of shifting sound environments composed with a textural outlook. Motivic transformations of pitch patterns and rhythmic cells were composed towards a fulfilment of the textural trajectory. *Bungee* therefore exemplifies the way that throughout the portfolio, processes of adapting rhythmic patterns are often linked to shifts in pitch environment, timbre and texture which are important to the sense of propulsion and urgency in forward motion.

The metaphor of the 'bungee' was explored in regard to several different parameters of composition which include the qualities of local gestures and rhythmic characteristics, as well as architectural textural ideas. The bungee analogy brought with it the idea of an 'elastic' gesture, a cyclical motion representing the repetitive downward bounce and upward return of the bungee chord. For example, in the bass clarinet and double bass duet at bar 68, a set of three pitch-groups are juxtaposed, and are gradually compressed to form a shorter phrase (see Example 11). The three pitch-groups are reduced to three pitch pivots, around which the cello and double bass *glissando* up and down. The sonic gesture and performers' actions here relate to the idea of a bungee movement; a downward fall is followed by a bounce or *glissando* up to the original starting point.

Bar 68
Bass Cl.

Bar 73

Bar 77

B. Cl.
D.Bass
Unit "A"
Unit "B"
Unit "C"

Units consolidated & instrumental parts mixed
Bar 88

B. Cl.
Db.
"A" - "B" "C"
"A" - "B" "C"
"A" - "B" "C"
"A" - "B" "C"

Bar 94
One-bar cell formed
Distilled & consolidated

B. Cl.
Vc.
Db.
"A" - "B" - "C"

"Bungee" gesture in most condensed form
Bar 101
Culmination of B.Cl/
D.bs/Vc. passage

Compare original chords
1. 3. 4. 5. New 5-pitch set

Vc.
Db.
i ii iii
2. 6.
ii iii

Example 11: bars 68-101, *Bungee*

The adrenaline filled experience of repeatedly hurtling up and down on a bungee also relates to the frenetic repetition and pace of change in action. For the majority of the piece, pattern was not conceived in terms of metre, but rather as a figure which gradually evolves, without clear reference to time signature in its accentuation and pitch contour. For example, the passage between bars 20-46 traces gradual changes within a five-beat pattern which eschews the sense of a clear downbeat, and is adapted to a six-beat pattern at bar 41. Within this short time, the accentuation within the pattern and distribution of beats within the ensemble changes substantially. The conductor's beat

and the metre frame the rhythmic pattern as it changes its length, accentuation and profile. Amidst these changes, there is still a heavy emphasis on repetitive activity and on cyclical pitch motion which suggests recurring actions.

Therefore in one sense, the bungee metaphor relates partly to the characteristics of local events and gestures. This metaphor also exists in my abstract conception of form, as larger scale events are shaped by cyclical expansions and compressions of texture. The composition of the piece originally began with thought to texture and pitch. As shown in Example 12 below, the idea of an elastic bungee movement was framed by three textures which span a wide register; the process of transformation between these states corresponds to the metaphor of elastic movement in the expansion and compression of texture. The textural pattern can be summarised in this way:

1. Activity in extremes of range;
2. Dense texture in the middle-range;
3. Broadening of register and orchestration

These textures are linked to three pitch-groups and three sets of motivic figures. During many sections in the piece, pitch and register are co-dependent, as whenever the ensemble plays in a particular register, the corresponding set of pitches is used. Pitch handling has been approached as a means to evolve elastic gestures and to propel the rhythmic permutations that are the driving force of the piece. By ‘elastic’, I refer both to the previously described characteristics of local musical motifs and gestures and the cyclical compression and expansion of texture, which follows a gradual process. These graded transformations also suggest a sense of being constantly in motion, and travelling from one state to another. This illustrates the way that my approach to transformation is governed by composing moment-to-moment evolutions of cellular ideas which, in *Bungee*, was framed by an overall textural scheme related to pitch.

Basic pitch material for *Bungee*

Texture "A"	Texture "B"	Texture "C"
1.	3.	5.
2.	4.	6.

Texture "A": ostinati in extremes of register

Pitch content	Relationship between the chords	Ostinati
Upper register 1.	chord 1. transposed down one tone → 1.	(1.: basic motivic figure)
Lower register 2.	upper note raised by semitone to form maj. 3rd + tritone 2.	(2.: basic motivic figure)

Texture "B": alternating cluster chords

Ostinato	Process of constructing the chords
	(1.)
	3.
	4. Strands from texture "A" gravitate towards cluster Chords from texture "A" transposed down a tone
	4. 4th replaced with maj. 7th B in bass creates 'packed' chord
	4. 4th extracted & transposed E♭ chord
	5.

Texture "C": broadening

Ostinati	Pitch content	Construction of chords
Upper register 5.	5. 6.	3. 4. 5.
Lower register 6.		3. 6.

Similarity relationship Similarity relationship with chord 1. as cycle is repeated

Example 12: organisation of pitch in *Bungee*

Lachrimae and *Carousel*: fluctuating transformations

Lachrimae and *Carousel* exemplify the way that turbulent changes in the orientation of metre, accentuation and pattern work in conjunction with the rate of change in pitch, texture and timbre. For both of these pieces, the turbulence emanating from evolving patterns is connected to other compositional processes, and large-scale systems of transformation.

Lachrimae is based on John Dowland's pavane of the same name, which was later adapted and renamed to become the air *Flow My Tears*. It was written in 2011 as part of The Sage Gateshead's 'Old Meets New' project in which composers from Newcastle University wrote new works for Northern Sinfonia which brought old pieces into contact with contemporary compositional ideas.⁶⁶ The intent behind this composition was to create an ebb and flow between close references to Dowland's melancholic piece and motoric chains of action which are further removed from the character and content of the pavane.

My division of the melody

A. Melodic Strand i

B. Melodic Strand ii

Ai. Rhythm of Melodic Strand i

Aii. Rhythmic diminution of Melodic Strand i

Aiii. Aii using sequence of pitches from A

Example 13: extraction of melodic strands, *Lachrimae*

⁶⁶ The piece was later selected to be performed again in Northern Sinfonia's 'Late Mix' series at the Sage Gateshead in 2012.

I approached this by creating different ‘stages of removal’ from Dowland’s *Lachrimae*. Some of the music in my *Lachrimae* comes from a ‘first stage’ treatment, which retains significant musical features which are closely related to the original. From here, I worked with, or created variants from the results of these ‘first stage’ treatments, moving to ‘second’ and ‘third stage’ ‘treatments’. This resulted in sketches which have a varying closeness in their relationship to Dowland’s piece. In my *Lachrimae*, transformative action is used to bleed the different versions and sketches of material into each other. This was framed by the idea of scrambling and unscrambling versions of the pavane’s melody. The overall structural idea was to create shifts in content and the speed of progression by using both gradual processes and abrupt textural changes. The piece involved architectural planning, but was often built through a ‘moment-to-moment’ process which played with the pool of sketches I had created.

My various versions and sketches of Dowland’s *Lachrimae* revolved around experimentation with different treatments of the pavane’s melody and melodic rhythm. My experimentations resulted in an extraction of two layers from the melody, which involved dividing the pavane into two different lines. The two layers that arose from this process exist in many forms throughout the piece. The idea was to create fluctuations between passages that have a hazy reference to the original, if any, and crystallisations of recognisable variations on the pavane. In the pre-compositional stages of writing the piece, I extracted two separate layers from the melody. These were both then subject to rhythmic diminution, along with other slight modifications, as shown in Example 13. The first extracted melodic layer became a recurring bass riff, while the other layer gave rise to a jaunty, syncopated melody. These threads could then be ‘unwoven’ towards their original form, as at letter F, or fragmented and modified to form further removed versions of the original.

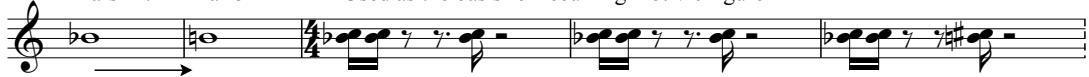
For example, the opening is built around segments of the bass and treble phrases shown in Example 14, which have been fragmented and each individually transposed in correspondence with an underlying chord sequence. From the beginning of the piece, the music traces the process of unscrambling the pavane, from idiosyncratic happenings of the transposed fragments, to their ordering around the chord sequence at letter A, followed by the manifestation of the two superimposed riffs at B, bar 36, which increasingly reassembles Dowland’s original melody at letter F (see Example 15).

This process of bleeding between different versions of the pavane was structured around different phases in the rate and nature of the music’s overall transformative path. *Lachrimae* explores how this flow may be interrupted, may divert, stutter, start or halt.

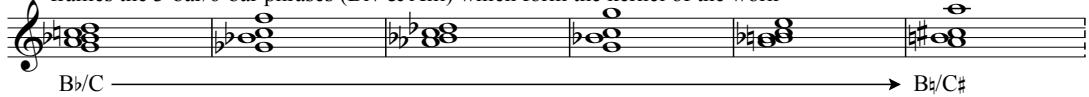
This idea materialises in shifts between rapidly transformative action, repetitive and gradually changing material, and static passages which focus on the layering of different rhythmic strands.

Tierce de Picardie outlines
most basic harmonic change
throughout the pavane

Bars 1-7 Bar 8 Used as the basis for recurring motivic figure



C Raised semitone becomes outline for recurring harmonic sequence in the piece;
frames the 3-bar/6-bar phrases (Biv & Aiii) which form the kernel of the work



Ci Sequence is also heard with Bb/C transposed up perfect fifth



Biv. fragmented into significant figures



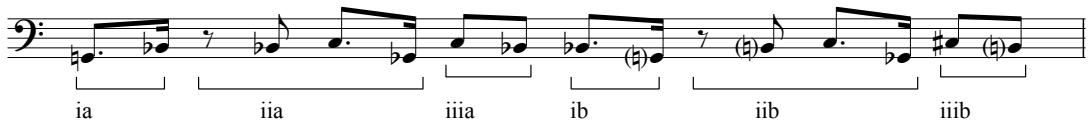
biv. Materials for opening: fragmented figures transposed, following pitch content of chord progression C



Aiii. fragmented into significant figures



a iii. Basis for opening: fragmented figures transposed, following pitch content of chord progression C



Example 14: pre-compositional sketches, *Lachrimae*

Riff for figure O is an 'imitation' of the rhythm of Aiii/aiii



Compare pitch content to biv

i ii iii iv v vi

Compare pitch content to aiii

biv. transposed down one tone

i ii iii iv v vi

aiii. transposed down one tone

ia iia iiiia ib iib iiib

Example 14 continued

Bar 77

Two versions of the melody combine, using original melodic rhythm

i ii iii iv v vi

i ii iii iv v vi

Example 15: bar 77, *Lachrimae*

We could divide the passage from B to K into three sections which feature changes in the flow of motion. From A-E, we hear repeating patterns in a presentation of definable rhythmic layers; the overall impression is likely to be of repeating segments. This consists of layering the two lines extracted from the melody, which is gradually ‘unpicked’ into a clear reference to the original at E. Pitch environment therefore gradually moves from the pitch groups shown in diagrams biv and aiii (see example 14 above), towards the suggested key of G minor at letter E. Therefore, between A to E, the music follows a steady gradient of transformation along the course of around 2:30 minutes in the submitted recording; the degree of change over this amount of time is moderate in relation to the events of the rest of the piece.

The passage between E and G lasts for around two minutes, during which action is considerably more static due to the repetition of a short melodic line which lingers in G minor. The focus is simultaneity, where interest comes from the relationship between the bass pizzicato and the violins’ melodic phrases. The propulsion of transformation which begins at letter G is intended to lead the music away from stasis towards a further-removed version of Downland’s *Lachrimae* at letter K. This is coupled with a move away from the suggestion of a tonal key towards movement through pitch-groups based on transpositions of the chords shown in C/Ci (see example 14 above). Between G-K, one might experience much more rapid transformation of the content of the material, which is dramatic in proportion to the passage’s duration (around 2:30 minutes). This encourages a sense of fast, linear movement. These three passages exemplify the ‘gear-shifts’ in the rate of transformation throughout *Lachrimae*.

Carousel is also based around the idea of propulsion and retreat in the rate of transformation. This piece was written for the London-based Busch Ensemble, and was performed 17th June, 2011 at St. Mary’s Church, Newcastle.⁶⁷ The metaphor of the carousel relates to my composition of three ‘categories’ of (related) material which represent three stages in the flow of motion on a merry-go-round ride. Therefore the three ideas at the foundation of the work correspond to these different points in motion on the ride. This encompasses fluctuations between the ride in its fastest, full flowing state, the motion of the ride at a steady pace, and the residual movement of carriages at the point where the ride lies on the cusp of stasis and movement.

⁶⁷ See *The Busch Ensemble* <http://www.margaretmurphy.com/busch/busch.htm> (accessed 11/01/2013).

Original pitch sequence

Cluster chords for material "i"

Cluster chords for "i", transposed up one tone, as it appears at figure F

Pulse cycle; rhythmic cycle for material "i"

Material "ii"

Chords generated from original 5-pitch sequence

Non-retrogradable rhythm: consolidation of original pulse cycle

Direction created by repeated compression of chord, and textural change

Material "iii": pitch sequences based on linear arrangement of cluster chords from "i"

iii

* First note of sequence according to pitch sequence from "i"

Sequence transposed and segmented each time gradually making repetition more apparent

iiia

iiib

iiic

iiid

Example 16: pre-compositional work for *Carousel*

I explored different speeds in the flow of motion both in terms of the vigorousness of the performers' instrumental actions, and in my thinking about the speed of transformation in terms of timbre, pitch and rhythmic pattern. Most of the music derives from the rhythmic cycle which appears in its full version in the solo violin entry at letter F, bar 129 (see Example 16). The idea of circularity is explored in pitch movement, which is based around five groups of clusters aimed to suggest cyclic motion through the use of a palindromic rhythm and repetitive pitch movement. Pitch choice for category "i" (which appears at letter F) was aimed towards a fairly consistent

soundworld which has a sense of stasis; the reduction in forward motion is therefore coupled with bareness in texture and cyclical pitch movement. At F, the consistent sonic environment affords more attention to the violin's isolated *sul ponticello*, which breaks from the rich overtones of the preceding microtone clusters.

Category 'ii' can be considered the 'medium' rate of motion which occurs most clearly between I and J. In terms of harmony and timbre, the music develops gradually, changing and accumulating new chords, though avoiding transformation to a new musical environment. Repetitive rhythmic movement presents cells which are gradually lengthened through the addition of new chords, moving from percussive scratches to open-string chords. Pitches orbit around the five-note sequence shown in Example 16, gradually reducing the content to include increasingly small intervallic values. Each of the chords in the opening of the piece originate from the sequence of material which develops between figures I and J (see also Material 'ii' in Example 16).

Category 'iii' represents the fastest rate of motion, featuring transformation to notably different musical environments in short spaces of time. This category has consistent qualities in its soundworld, but tends towards dramatic transformation, such as that between C to F, where pitch content, texture and rhythmic properties become markedly different. The architecture of the piece consists of shifts in the speed of change between the three different rates of transformation.

In *Carousel* and *Lachrimae*, the precariousness of the moment-to-moment rhythmic mutations is intertwined with structural schemes which organise the pace of transformation. Sometimes, particular sounds or sound environments drive rhythmic permutation. At other times choices, in pitch and timbre underpin processes of change in the local rhythmic features. Very often, choices of sound and rhythm come together. This discussion highlights that frenzied periods of evolving repetition are not solely to create drama in performance, but are importantly connected to sonic ideas.

Zeta Potential

Zeta Potential brings together several threads which have run throughout this commentary. As the longest piece in the portfolio, it exemplifies the interconnectedness between architectural considerations and turbulent moment-to-moment action. It also treats the dynamic of the ensemble, and particularly the negotiation of hyperactive rhythmic interplay, as a key aspect of compositional thought. The working relationship

with the performers was also a particularly satisfying one, offering much to think about in terms of my future development.

Zeta Potential was composed for Amsterdam's Nieuw Ensemble as part of a programme led by Huddersfield Contemporary Music Festival. The European Composer's Professional Development Programme placed young composers in collaboration with a European ensemble outside their country of study to gain experience in working with professional players specialising in contemporary music. This also came with the opportunity to have the work performed again in the ensemble's home country.⁶⁸ Apart from the obvious appeal for any composer, it offered a chance to explore how my ideas fared with an ensemble whose performance practice is centred on contemporary music.

Work on *Zeta Potential* began with ideas of flux between 'solid' and 'fluid' textures, and cycles of growing and decaying musical patterns. I associate 'fluidity' with greater homogeneity in texture; motivic shapes, patterns and pitch materials are less defined. A 'solid' texture exhibits a clearer pitch basis and strong, persistent rhythmic patterns which organise the ensemble into clearly defined roles. These ideas are realised in constant transitions, as the unstable texture and rhythmic interactions between players undergo continual transformation. *Zeta Potential* plays with the capability of the ensemble and layered texture to remain as a coordinated and stable mechanism.

In rheology, the study of the flow of matter, Zeta Potential is a calculation which measures the stability of semi-fluid/semi-solid substances.⁶⁹ Where one substance is dispersed through another, Zeta Potential measures the degree of repulsion or attraction between adjacent, similarly-charged particles in substances such as gels and jellies. Therefore it considers the capability of the system to remain in its present state. As well as liking the name, I thought this concept was an ideal representation of activity throughout the piece.

The opening, until letter A, was aimed towards creating a mesh of bass clusters from which arises a degree of regularity in pattern, pulse and pitch. The conductor does not beat this section, since the aim was for a persistent repetitive quality to develop later. In the opening section, players react to specific cues in their parts which indicate the activity of the instrument directly preceding their entry. This is supported by

⁶⁸ *Zeta Potential* was performed 21/11/2012 at St. Paul's Hall, Huddersfield Contemporary Music Festival, and 23/11/2012 at Conservatorium van Amsterdam.

⁶⁹ More accurately, it measures the electrokinetic potential of colloids, types of homogenous mixtures in which the particles do not disperse evenly, such as in gels, jellies, mayonnaise, or quicksand.

discrete signalling from the conductor at the beginning of each system, according to the numerical rehearsal marks in the score. Clarity and repeating gestures gradually emerge until the conductor begins to beat metred time at A.

The embryo for the compositional process came from the rhythmic pattern shown in Example 17, which has served as a starting point for several ideas throughout the piece.



Example 17: *Zeta Potential* pattern

Bars 1-15: 2 layered pulses
Sustained-sound layer

Bars 19-29: cycle disrupted, 5/4 replaced with 5/8 to propel rhythmic change
²⁸ Sustained-sound layer: dynamics outline rhythmic pattern

Bars 30-40: 4/4 replaced with 2/4 to propel rhythmic change & increase pace (9/8 pattern in 2 parts)
2 layers begin to blend, with this overall rhythmic emphasis

Bars 41-59: rhythmic pattern compressed to form 7/8

Example 18: development of rhythmic cycles, *Zeta Potential*

The events of the opening were led by the idea of chiselling dense textures towards the pattern in Example 17, which appears most definitely at letter L, bar 143. The passage between A to N introduces the superimposition of a percussive layer with another

instrumental group playing heavy vibrato or glissandi; this textural division recurs throughout much of *Zeta Potential*.

After N's violin solo, the music follows another process of forming cyclical patterns from material lacking clear rhythmic shape. In *Zeta Potential*, much of the music emanates from explorations of limited sets of sounds at a given time, which often serve as the basis for setting in motion processes of transformation. From bar 181 until around bar 274, textural-rhythmic patterns grow from the timing of the strings' shifting timbre, which is adopted by other instruments in new cyclic patterns. Changes in sound quality in the strings' gliding bow positions are the catalyst for the transformative process that ensues (both in terms of my compositional process and the resulting music). The metallic-like chimes of crotales, piano and harp pick out the strings' arrivals at *sul pont.*, eventually developing into a pulse cycle.

These patterns are eventually squeezed into a single phrase, gradually maturing into a groove at bar 304. The tension of consolidating this groove towards unison downbeats was intended to spill over into the rapid *accelerando* until the pulse is lost, as though the demands of the conducted beat cause a collapse of coordination.⁷⁰

Bars 250-271: general rhythmic emphases of the three layers

The musical score consists of three staves. The top staff is labeled 'Woodwind' and shows a single note followed by a rest. The middle staff is labeled "'Chimes'" and shows a series of eighth-note pairs. The bottom staff is labeled 'Bowed and plucked strings' and shows a series of eighth-note pairs. The score is in common time (indicated by a '4') and features a key signature of one sharp (F#).

Example 19: *Zeta Potential*, bars 250-271

Bar 342 instigates a different type of rhythmic organisation. The aim is to generate awkward repetitions as players respond immediately to the cues in their parts, which indicate the entry of the instrument directly preceding them. The material for bars 342-351 derives from previous moments in the piece, as does the following activity beginning at bar 354. Example 20 outlines the relation of the three segments of music between 354-365 to earlier moments in the piece: (references to pitch material will be explained):

⁷⁰ This was one area that needed more rehearsal time, as I think the impression in performances was somewhat different.

Bar 354: closely related to original pattern
Chord 2

Bar 356, viola: compare violin line at bar 100 (& recurring in many string parts in this passage)
rooted around Chord i:

Bar 100, violin

Bar 362, piano/harp

Based on these chords:

4. (3.T) 4. 4. (3.T) 4. 2. trans. 2. 2. trans. 2. 2. trans.

Example 20: *Zeta Potential*, bars 354, 356, 362

The final stages of the piece play with saturated combinations of the three ideas shown in Example 20 as a means of exploring different scales of textural clarity and stability in rhythmic patterns. For example at EE, bar 393, the three musical elements are layered in a bar-long pattern to shape a clearer, repetitive unit. As in various other points, the action involved in the process of forming this repetitive pattern is intended to boil over into a collapse; rhythmic cells begin to lose their structure at bar 405 towards a mesh-like texture. While the musicians still follow the conductor in the ensuing disintegration of synchrony, they lose their attachment to the rhythmic activity of their fellow players, along with blurring clarity in pitch.

i: dominant pitch material between A- M

1.
i transposed up minor 3rd

2.
1. + last 3 notes up semitone

3.
2. + new additions up semitone

4.
3. + new additions up one semitone

5.
4. + new additions up one semitone

6.
5. + new additions up one semitone

Chords deriving from transposition process

1. 2. 3. 4. 5. 6.

Example 21: transposition process in *Zeta Potential*

In *Zeta Potential*, I aimed to avoid the sense of constant static harmony, yet alter pitch material in a way that evinces a fairly consistent soundworld. Generally, similar intervallic relationships are retained throughout the piece in chordal material and in prominent instrumental lines. This is because the method of permutating pitch-groups was often based on transposition. The starting point for these permutative processes was the group of four pitches labelled as ‘i’ in Example 21, around which I built a process of accumulative transposition. The sequences from Example 21 appear in the woodwind parts between T and Y and the ascending string parts between bars 268 to 295. The ‘chime’ material played by piano, harp and crotales/marimba also follows its own accumulative process of the chords shown in step 6.

Example 22 outlines pitch change throughout *Zeta Potential*, followed by a summary of texture. I have included these two summaries in succession because they highlight the way that pitch and texture transformations are often closely linked. Pitch relationships were not constructed under any strict formula, with the below examples aiming to reflect on recurring ideas, transformations, and landmarks.

Section

Pitch Summary

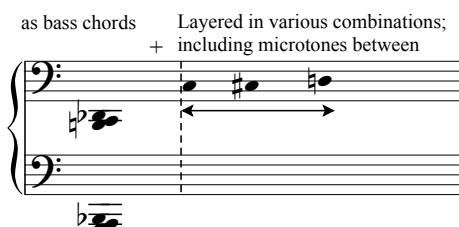
R.Mark 0-2



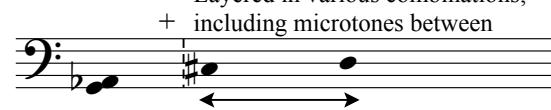
R.Mark 3-5



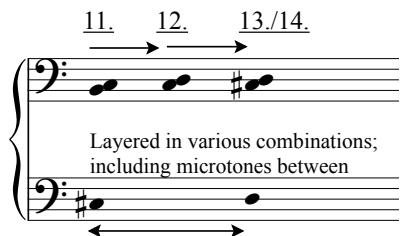
R.Mark 6-7



R.Mark 8-9



R.Mark 9-12



Bars 1-40

Percussive layer

Vc., Db., B.Fl., B.Cl.

Example 22: summary of pitch change in *Zeta Potential*

41-59

Microtonal clusters in this region → Microtonal clusters in this region

60-142

Primarily Chord i:
 (also with Chord 2 intermittently)

143-181

Chord 1

182-233

Microtones within this region

234-294

Accumulative process building up sequence of chords 1-5; strings explore microtones surrounding Gsharp

295-327

Anchored by Chord 2; layered segments from accumulative transposition sequences

328-341

Full sequence gradually accumulated:

6.

342-346

6.

Example 22 continued

348

In fragments

Chord 3 Chord 4

349-350

In fragments

Chord 2

351

Chord 2

354-392

Bar 379 Bar 383 Bar 389:

Chord 2 rooted around based on these chords:
 chord i: (with:) 4. (3.alt) 2.trans. 2.

393-415

(less defined
towards 415)

4. (3.alt) 2.trans. 2.

Chord i:

Based around:
Chord 2 Chord 3 Chord 4 Chord 5

416-428

Dominated by pitches
of Chord i

Pitches descend microtonally
from these anchors

429-end

Descent to these pitches

Example 22 continued

Passage	Texture Summary
R.Mark 0-2	Homogeneous: dense; bass; fluid; narrow pitch range
R.Mark 3-6	Homogeneous: as above, with texture clearing occasionally
R.Mark 7-9	2-part texture: bass chords from Hp./Gtr.; sustaining instruments form unit building microtonal clusters
R.Mark 10-112	2-part texture: low register; as above, but sustaining instruments become more prominent
Bar 1-40	2-part: sustaining instruments retain material; mid-register percussive material; similar pitch material but differentiated by rhythm & duration
41-59	Generally homogeneous; hp./pno./gtr. break away in descending runs
60-142	2-part texture; saturated mid-low range with glissando strings/w.wind; vla./vln. lead in mid-register; subsidiary percussive pattern
143-180	2-parts competing in middle register; sustaining instruments with microtonal or pitch-bending parts; percussive ostinato
182-233	Monophonic: solo violin Chordal support from Harp/Piano
234-294	Initially dominated by static strings Three layers form, differentiated by timbre and register
295-327	2-part texture; descending blocks from winds/vln./vla; chords from percussive layer
328-341	Sparse texture becoming progressively broad; comprised of many parts
342-344	Homogeneous, broad texture
345-348	3-part texture; arranged in sequence
349-351	Mesh of related gestures
354-409	3 types of homogeneous texture heard in sequence; layered to create 2/3-part textures
410-416	Saturated, rich textures gradually becoming increasingly homogeneous and lacking in gesture
417-437	Homogeneous: descending towards bass register; abrupt prominent entries from different instruments disrupt the texture
438-end	Homogeneous: bass tremolos

Table 1: summary of textural change in *Zeta Potential*

These summaries reflect on changes in the organisation of the ensemble throughout the piece. A key concern in my approach both to the content and the manner of scoring the

music was the way that interaction between players could also shift alongside textural changes. This relates to the overarching concept of the rhythmic relationships between the players breaking, reforming and evolving; a review of textural changes gives a bird's eye view of partnerships and divisions between instruments. The nature of rhythmic interaction is a more major musical element in some passages more than others, however I regard it as a constantly changing parameter. A key idea is the propulsion of pattern-based ideas to maximum intensity, where the demands of the conducted beat cause rhythmic coordination to break down or deflect to a different type of organisation.

This is again reminiscent of Peter Nelson's understanding of 'rhythm as social agreements'.⁷¹ The characteristics of rhythmic negotiation are highly mutable throughout *Zeta Potential*. This concerns the way the score asks players to interact with each other, and in the way that metred rhythms channel varying power relationships and changing partnerships in mutating, interlocking patterns. Rhythmic relationships constantly readjust throughout *Zeta Potential*, as patterns of coordination are displaced at several points. Changing patterns and sequences are likely to impact on players' experience of engaging with the score; processes of breaking-down and regaining coordinated patterns are important in metred passages as well as unmetred sections. This often follows a cycle leading from instability in rhythmic relationships towards highly repetitive activity with synchronised sectional parts. This instils the performance with a task-like ethos, of 'keeping-up' with prescribed rhythmic changes.

I consider there to be several instances of negotiating changing 'social agreements' of rhythm in the metred passages of the piece. From around W, bar 291, rhythmic relationships change by converging towards a single ostinato. The three related, but differentiated rhythmic strands are collated, forming a single pattern at bar 304. Here, each layer eventually discards its original pulse cycle to form an entirely new structure which brings the players towards a synchronised groove.

From bar 354, which follows an unmetred passage, the re-acquisition of a conducted 4/4 propels and organises abruptly changing material. This aligns players with a generic pulse led by the conductor, and activity is channelled towards repeating cycles which layer the three rhythmic patterns (see EE, bar 393). As this section is also fairly physically demanding for the players, from bar 398 onwards I imagined the ensemble loosing its rhythmical balance; parts which were once aligned in sectional

⁷¹ Peter, Nelson, 'Some Aspects of Rhythm' [unpublished draft article], http://www.academia.edu/288249/Some_Aspects_of_Rhythm, [accessed 31/01/2011], 9-10.

patterns fall into independent strands which are increasingly unattached to other musicians. For example, the piano, guitar and bass clarinet function clearly as a synchronised section from bar 380, but from around 416 their parts begin to become independent. The same can be said of the viola, mandolin and oboe or the piano and harp. As the soundworld becomes increasingly monolithic, the players follow independent parts in a homogeneous whole, directed and coordinated by the conductor, but with each instrument following its own pathway. This traces an unpicking of synchronised, mutually dependent rhythmic parts and sounds.

At letter E, bar 60, we hear a deflection to a different textural and rhythmic environment to the preceding material. I aimed to break from the ensemble's previous collective perseverance through shifting metres into more precarious rhythmic coordinations at E. The focus here is the tension between the different treatments and balance of repetition within the parts. I regard the ensemble to shift from clearly defined rhythmic partnerships within the ensemble to a series of less stable, more 'fluid' rhythmic strands. This precariousness is accentuated at G. Here the sparse texture and fragmented statements of the instruments aim to create unstable bonds between the parts, as though the players are working to stay in time with one another. By bar 102, these relationships have accumulated regularity in the four-bar pattern.

An important precedent to *Zeta Potential* is the music of Fausto Romitelli (1963-2004). In particular, his *Professor Bad Trip* cycle is appealing for me in its commitment to a soundworld saturated in repeating and evolving events. This provides an audible backbone of musical ideas which linger throughout the triptych, whilst also evoking a sense of constant metamorphosis which is highly agitated. I became interested in Romitelli's use of repetition as a means to overtly distort or transform characters, sounds, segments or events. 'Lesson 1', for example, traces an increasing deformation of a sequence of events. The process of transforming the repetitive sequence is magnified, as though forces are being employed upon the sounds (this can sometimes be taken literally in his electronic parts and other electronic works). When listening I hear very audible actions which transform sonorities, repetitive sequences or musical cells. The processes involved in these transformations are a central aspect of my listening experience in *Professor Bad Trip*.

Romitelli asserts the compositional actions employed to sounds or events as prominent aspects of listening, which resonates with many of my aims in *Zeta Potential*. I think this is predominantly felt in the use of repetition to dissolve or build pitch-patterns, gestures, and cycles of events. It has often been my intention to suggest

that the music and ensemble are undergoing periods of metamorphosis or are subject to actions which change their properties. This sometimes blurs a distinction between notions of musical material and process; change is not only a feature of transition, but is almost a constant factor in the piece. While in several cases I composed by imagining a certain process being employed onto material, sometimes existing ‘materials’ propagate ideas in a moment-to-moment manner; process arises after the fact and after the ideas sparked by the sounds, or imagined sounds. The process of composing *Zeta Potential* felt to me like a combination of these two ways of thinking about process.

In certain passages, rhythmic interactions take on more central musical interest than in others; constant shifts in the players’ relation to one another emphasise this as a significant aspect of the music. My score does not create this quality in a unique way, since this is something present to varying degrees in an ensemble’s interpretation of any score. I suggest that in *Zeta Potential*, this aspect of the music is magnified, becoming an important factor in the work’s performance, composition and arguably its reception. Through changing sectional relationships and prescribing changes in the stability of rhythmic coordination, players alter their actions and the way that they relate to other musicians; sometimes this is subtle, sometimes more pronounced.

Nevertheless this is most prominent in the introduction and from bar 342 where the score causes the most substantial changes in the coordination of the ensemble. Here, the players no longer follow a common unit. Instead, each musician follows direction from a different source, from the player who cues them. Though spatially notated sections are outweighed by the metred passages in terms of duration, these instances are important in the breaks they force from a conducted beat. This task is a means of instilling a new focus in performance. As a dramatic and sonic device, unmetred passages attempt to illuminate or emphasise the pressures of the directed rhythmic units in the rest of the piece. From bar 342, the rhythms that arise are a result of the musicians reacting as quickly as possible to a particular sound; rhythm is, or is created by, action in response to another person.

Working with the Nieuw Ensemble gave me an invaluable opportunity to explore these changing rhythmic interactions in more detail, and to develop a better understanding of the possibilities of the style of composition which has grown throughout this research. In a practical sense, the challenges of the scored material did not provide a significant barrier for the players; they had more time in comparison to other projects to gain familiarity with their parts, as well of course because of the great skill and experience of the musicians. This meant that both rhythmic accuracy as well as

the ethos of the music were important considerations of the players and the artistic director Joël Bons.

Zeta Potential was afforded more time for dialogue than the other large ensemble compositions of this portfolio; this was certainly significant to the development of an understanding between compositional intent and approach to performance. It was particularly important that this took place during my process of composing and trialing sketches with the ensemble, whose feedback influenced my development of the final piece. Most significantly, this contributed to the development of the cueing systems in the introduction and from bar 342, as we were able to experiment with several other versions of notating and organising these ideas. The agile capabilities of the Nieuw Ensemble meant that this particular collaboration provided well-suited circumstances to play with ideas of organised instability; their rhythmic proficiency and flexibility enabled the exploration of many ideas in the piece. This included valuable opinions and insights which importantly contributed to the final score. I think this investment in the music drove the intensity desired for instances of awkward, frenzied rhythmic coordination, without hindering the progression and flow of events throughout the piece.

Conclusions

Evolving repetition has been an indispensable tool throughout this series of pieces. It has been central to many of my ideas, as forms of repetition have acted as means to establish patterns and soundworlds, as well as to mechanise transformative pathways around which much of my music is based. Several of the pieces commit to the intention of sustaining a sound environment with a fairly consistent identity. The repetitive rhythm and pitch patterns characteristic of these compositions create limited boundaries within which musical transformation takes place. At the crux of this compositional approach are techniques which strive to instil a constant instability and turbulence in the transformation of rhythmic characteristics.

In the earlier stages of research, an interest in changing interactions within the ensemble arose as a by-product of hyperactive shifting patterns. Increasingly throughout the portfolio, I consciously considered such actions and interactions between musicians. This also concerns the way that the score asks an individual player to relate to notation. From here, my interest grew in provoking a particular type of mindset and action in response to the score, one of heightened alertness in adapting to the mutable prescribed rhythms and to the changing actions of other musicians. The practical experiences throughout this project have sparked my interest in further explorations of how the actions afforded by the score can function as a departure for compositional thought. Therefore I have been drawn to consider how my approach to notation, and ideas about performance and collaboration, may develop in the future.

My use of stave notation throughout this series of pieces has provided a shared means of communication with other parties during short-lived collaborations in traditional concert hall settings. Stave notation has been used as a means to enable the production of intricate rhythmic and textural evolutions, and facilitated players in becoming familiar with the scored ideas as quickly as possible. I still feel that for certain future projects, traditional notation can provide the best means of communication of some of my ideas. However, traditional notation only facilitates communication of ideas to a degree. Some collaborative experiences have been characterised by a distinct lack of dialogue and communication about approach to performance and its relation to the compositional; this has sometimes impacted negatively upon the final product. Further projects which use traditional notation would need to revolve around collaborative practices that allow not only for dialogue, but development and experimentation in regard to collaborative roles.

One conclusion is that composing for established ensembles with standard classical instrumentation and traditional working practice is not best suited to my compositional ambitions. I am certainly open to composing for ensembles whose focus is firmly in contemporary music. However this research has made it clear to me that future projects should be based around and develop from collaborations in which approaches to playing and compositional outlook are intertwined, complimentary and rooted in contemporary culture.

One option could be for me to form a regular band for the performance of my own work and that of those I collaborate with. This might form the basis of a new project investigating the impact of a regular line-up of musicians around which my compositions would be built. This could afford focus towards specific inter-ensemble relationships and provide potential to explore performance environments outside of the concert hall. In this model, I would imagine that the group would also include other composers, improvisers, or performers who wish to create frameworks for performance. Within this group, I would aim for flexible attitudes towards notation, with the opportunity to work both with conventional notation and other forms of notation or performance frameworks.

I also intend to base a project specifically around developing my work with graphic scores. I am particularly keen to develop scores revolving around ideas of gameplay, qualities which are nascent in the submitted projects. I intend to more deeply explore notation as a blueprint for action rather than only for prescribing action. This will involve more detailed consideration of the visual aspects of notation. I expect this work to involve close collaborations with players, however part of the appeal of this strand of the research is to explore the different approaches and results of working with a variety of musicians. Throughout this portfolio, I have prescribed the type of interpersonal relationships between players; the multiple ways in which people may respond to frameworks for rhythmic interaction is intriguing for me.

Therefore this doctoral research has not led me towards one specific pathway in pursuing my compositional practice, but at least two possible directions. There are motivations both for developing my practice around repeated collaborations, as well as aspirations to explore approaches to less predetermined scores with a variety of people. The rather consistent and focused qualities of the compositions submitted here point towards several different pathways for future development, and a broadening of the modes of interaction involved in my creative practice.

Appendix

Examples of graphic scores 1

The set of four circles in this example was used for the performances on tracks 1 and 2 of the Appendix CD.

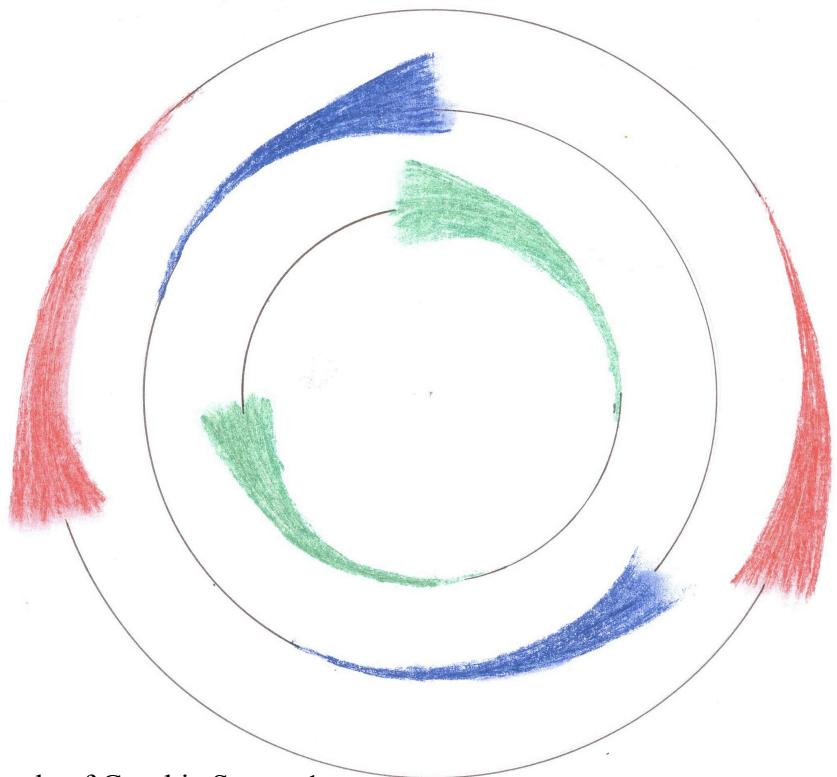
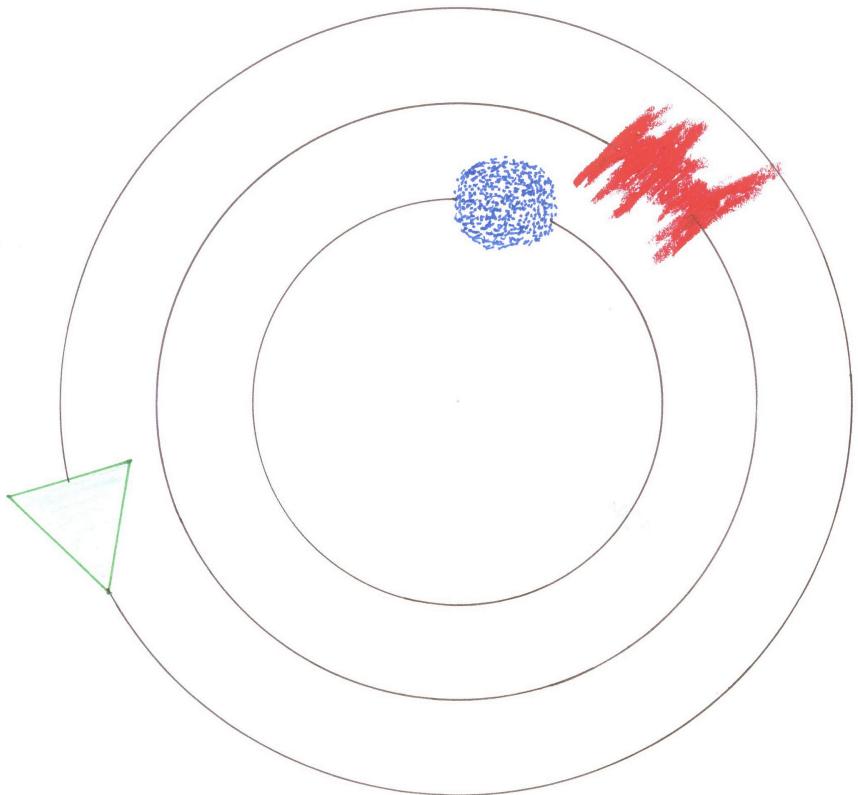


Figure 1: Example of Graphic Scores 1

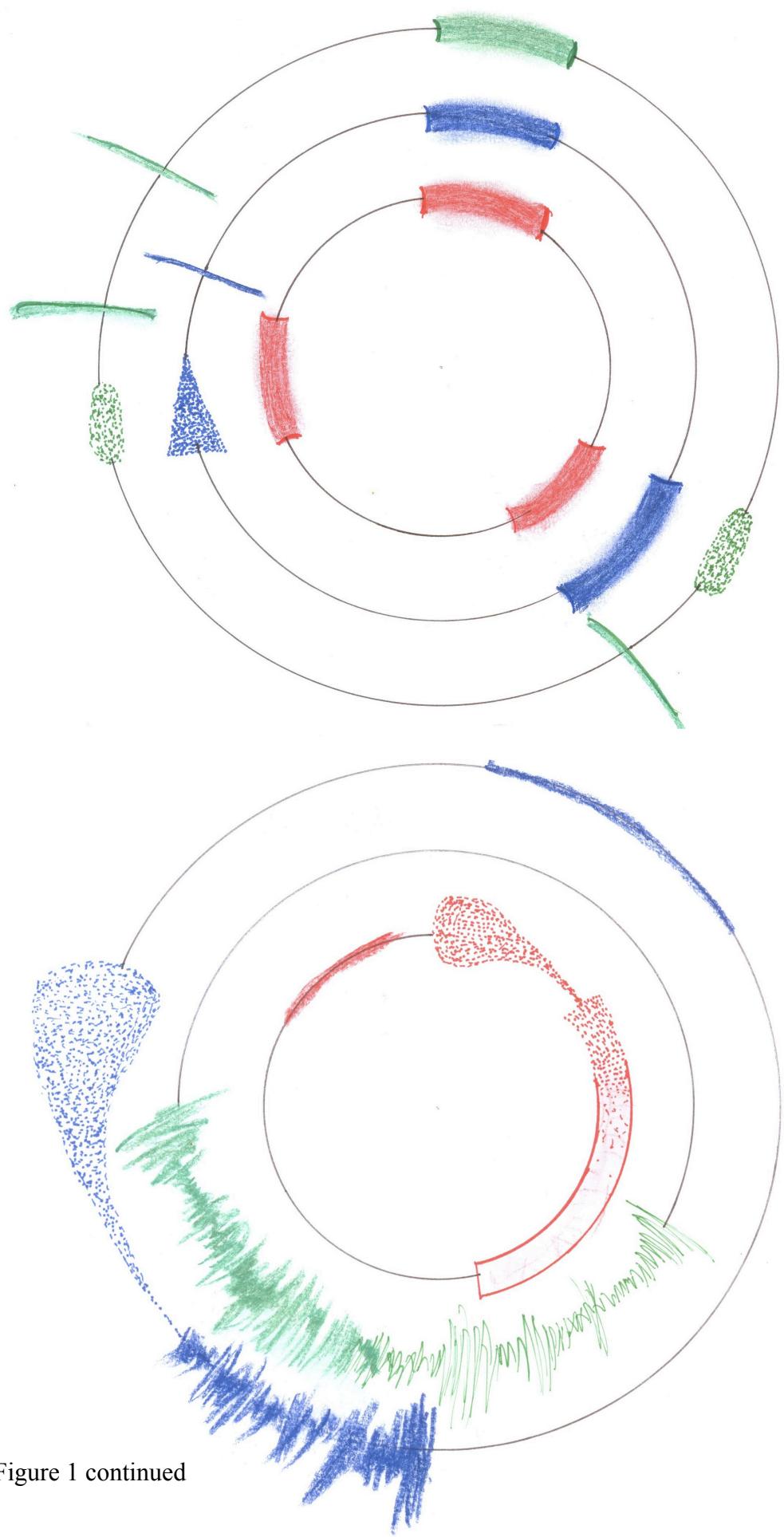


Figure 1 continued

Examples of Graphic Scores 2

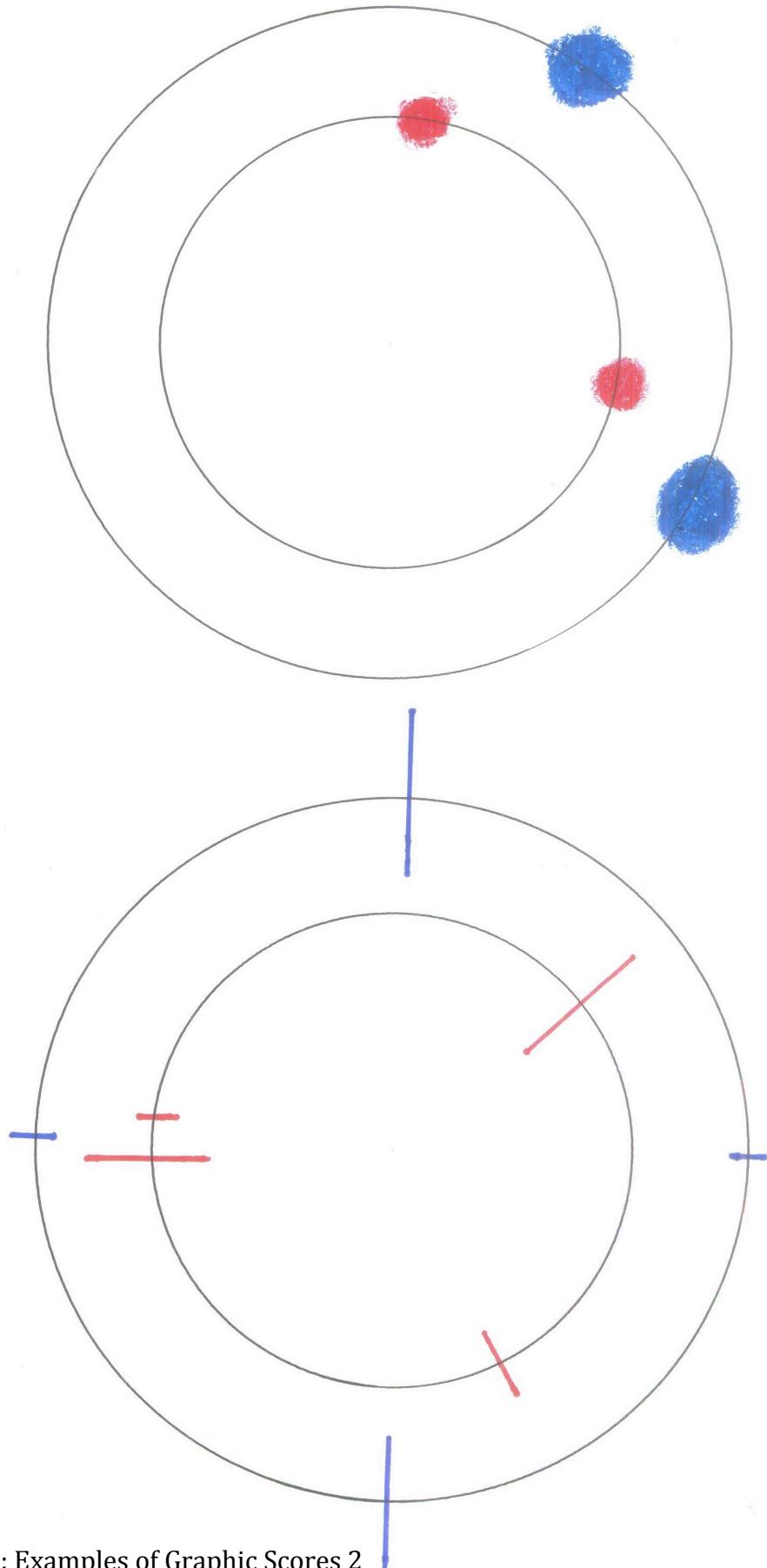


Figure 2: Examples of Graphic Scores 2

Bibliography

Books

- Andriessen, Louis, ed. Zegers, Mirjam *The Art of Stealing Time* (London: Routledge, 2002).
- Burt, Peter, *The Music Of Tōru Takemitsu* (Cambridge; New York: Cambridge University Press, 2001).
- Cage, John, *Silence: Lectures and Writing* (Middletown: Wesleyan University Press, 1961).
- Chase, Stephen; Thomas, Philip, *Changing the System: The Music of Christian Wolff* (Farnham: Ashgate Publishing Ltd., 2010).
- Cowell, Henry, *New Musical Resources* (Cambridge: Cambridge University Press, 1930).
- Ferneyhough, Brian, eds. James Boros and Richard Toop *Collected Writings* (London: Routledge, 1995).
- Everett, Yayoi Uno, *The Music of Louis Andriessen* (Cambridge: Cambridge University Press, 2006).
- Gann, Kyle, *Music Downtown: writings from The Village Voice* (Berkeley: University of California Press, 2006).
- Gann, Kyle, *The Music of Conlon Nancarrow* (Cambridge: Cambridge University Press, 2006).
- Griffiths, Paul, *Modern Music and After* (Oxford: Oxford University Press, 2011).
- Heile Björn, *The Music of Mauricio Kagel* (Aldergate: Ashgate, 2006).
- Lewis, George. E., *A Power Stronger Than Itself: The AACM and American Experimental Music* (Chicago; London: University of Chicago Press, 2008).
- Lock, Graham: *Forces in Motion: The Music and Thoughts of Anthony Braxton* (New York: De Capo Press, c.1988).
- Johnson, Tom, *The Voice of New Music: New York City 1972-82, A Collection of articles Originally Published in The Village Voice* (Eindhoven: Editions 75, 1989).
- Monson, Ingrid, *Saying Something: Jazz Improvisation and Interaction* (Chicago: The University of Chicago Press, 1996).
- Monk, Meredith, ed. Deborah Jowitt, *Meredith Monk* (London: The John Hopkins University Press, 1997).

- Östersjö, Stefan: *Shut up 'n' play!: Negotiating The Musical Work* (PhD thesis_Lund University: Malmö, 2008).
- Sachs, Curt, *Rhythm and Tempo: A Study in Music History* (New York: Norton, c1953).
- Samuel, Claude: *Conversations with Olivier Messiaen* (London: Stainer & Bell, c1976).
- Saunders, James, *The Ashgate Research Companion to Experimental Music* (Farnham; Burlington: Ashgate, 2009).
- Small, Christopher, *Musicking, The Meanings of Performing and Listening* (Hanover: University Press of New England, 1998).
- Stravinsky, Igor, *Poetics of Music: in the form of six lessons* (Cambridge: Harvard University Press, 1970).
- Tilbury, John, *Cornelius Cardew (1936-1981): A Life Unfinished* (Essex: Copula, 2008).
- Wishart, Trevor, *On Sonic Art* (York: Imagineering Press, 1985).

Articles

- Bernard, Jonathan W., 'The Evolution of Elliott Carter's Rhythmic Practice', *Perspectives of New Music*, 26/ 2 (1988), 164-203.
- Drott, Eric, 'Conlon Nancarrow and the Technological Sublime', *American Music*, 22/4 (2004), 533-563.
- Ferneyhough, Brian, in Bunch, James, *A Brief Comparison of Independent Elements of the music of Brian Ferneyhough and Christian Wolff* (Paper_University of Illinois, 2006-2010), 1.
- Frith, Simon, 'Rhythm: Race, Sex, and the Body', *Performing Rites: Evaluating Popular Music* (Oxford and New York: 1996), 123-144.
- Frith, Simon, 'Rhythm: Time, Sex, and the Mind', *Performing Rites: Evaluating Popular Music* (Oxford; New York: 1996), 145-158.
- Hayden Sam, Windsor, Luke, 'Collaboration and the Composer: Case Studies from the end of the 20th Century', *Tempo*, Issue 240, (2007), 28-39.
- Kuivila, Ron , 'Open Sources: Worlds, Circuits and the Notation-Realization Relation in the Music of David Tudor', *Leonardo Music Journal*, Vol. 14 (2004), 17-23.
- Marsh, Roger, 'Heroic Motives: Roger Marsh considers the Relation between Sign and Sound in 'Complex' Music', *The Music Times*, 135/1812 (1994), 83-86.
- Nelson, Peter, 'Some Aspects of Rhythm' [unpublished draft article],
http://www.academia.edu/288249/Some_Aspects_of_Rhythm, [accessed 31/01/2011]

- Nelson, Peter, ‘Cohabiting In Time: Towards an ecology of rhythm’, *Organised Sound*, 16/2 (2011), 109-114.
- Roeder, John, ‘Beat-Class Modulation in Steve Reich’s Music’, *Music Theory Spectrum*, 25/2 (2003), 275-304.
- Volans, Kevin, ‘Dancing in the Dark: Craft and Composition’, *The Craft Issue*, no.47 (1989), 18-20.

Internet Sources

- Fitkin, Graham, *Graham Fitkin- Composer*, <http://www.fitkin.com/future/band> (accessed 19/12/2012).
- Kingston University London, *Interview between Mike Searby and Steve Martland (composer) in 5 parts: part 1* <http://eprints.kingston.ac.uk/18032/> (accessed 08/03/2013).
- Notos Quartet*, http://www.notosquartett.de/Notos_Quartett_-_news_2.html (accessed 01/06/2012).
- ‘Otherminds: Conlon Nancarrow’, <http://www.otherminds.org/shtml/Nancarrow.shtml> (accessed 01/10/2012).
- Thomas, Philip, *Philip Thomas*, <http://www.philip-thomas.co.uk/biog.html> (accessed 02/03/2013).
- PRSFMusic, *Joe Cutler and Coull String Quartet*, http://www.youtube.com/watch?v=RFD_upGNamg (accessed 01/08/2012).
- Robair, Gino, *I, Norton: Gino Robair*, www.ginorobair.com/inorton/inorton.html (accessed 15/12/2011).
- Marikoperception, *kagel: match (1 of 2)* <http://www.youtube.com/watch?v=zNmjFvMERD4> (accessed 10/02/2013).
- Marikoperception, *kagel: match (2 of 2)* <http://www.youtube.com/watch?v=LPUG5wRsAUo> (accessed 10/02/2013).
- The Busch Ensemble*, <http://www.margaretmurphy.com/busch/busch.htm> (accessed 11/01/2013).
- Toovey, Andrew, *Joe Cutler Ping! Performed by the Coull String Quartet and marvelous Table Tennis Players*, <http://www.youtube.com/watch?v=mAllX89g05I> (accessed 01/08/2012).
- Untitledparkinson, *Christian Wolff- Duet I*, <http://www.youtube.com/watch?v=b0T-VU5j0MY> (accessed 22/10/2012).

Uniwarwick, *Ping! Music vs Table Tennis*,
<http://www.youtube.com/watch?v=NV830JlSyXQ> (accessed 01/08/2012).
Vicfirthdrumsticks, *Yale Percussion Group Performs Kagel's Dressur*
<http://www.youtube.com/watch?v=GYo5QlkK-Eg> (accessed 07/01/2013).

Scores

- Andriessen, Louis, *De Staat* (London: Boosey and Hawkes, 1992).
- Barry, Gerald, *Piano Quartet No.1* (Oxford: Oxford University Press, 1997).
- Cage, John, *Music of Changes* (New York: Henmar Press, 1961).
- Cardew, Cornelius, *The great learning: the first chapter of the Confucian classic* (London: Cornelius Cardew Committee, 1984).
- Cardew, Cornelius, *Treatise* (London: Edition Peters, 1970).
- Crumb, George, *Black Angels: Thirteen Images from the Dark Land* (London: Edition Peters, 1970).
- Fernández, Agustín, *A-Z: Nine etudes for flute and charango* (Newcastle: self-published by Agustín Fernández, 2006).
- Fernández, Agustín, *Wounded Angel* (Newcastle: self-published by Agustín Fernández, 1989).
- Ferneyhough, Brian, *Lemma- Icon- Epigram: solo piano* (London: Peters, 1982).
- Ferneyhough, Brian, *Second String Quartet* (London: Edition Peters, 1981).
- Ferneyhough, Brian, *Sonatas for String Quartet* (London: Edition Peters, 1968).
- Kagel, Mauricio, *Match: für drei spieler* (London: Universal Edition, 1967).
- Lang, David, *Are you Experienced?: for narrator, electric tuba and 13 players* (London: Novello, 1990).
- Martland, Steve, *Horses of Instruction* (London: Schott, 1999).
- Romitelli Fausto, *Anamorphosis* (US: Tzadik, TZ8087, 2012).
- Romitelli, Fausto, *Professor Bad Trip*, performed by Ictus (Belgium: Cyprès, CYP5620, 2009).
- Stravinsky, *Les Noces: scènes chorégraphiques Russes avec chant et musique* (London: J & W Chester, 1922).
- Volans, Kevin, *Piano Trio* (London: Chester Music, 2007).
- Wolff, Christian, *Toss* (London: Oxford University Press, 1970).
- Wolff, Christian, *Duo for Pianists II* (London; New York: Edition Peters, 1962).

Recordings

- Andriessen, Louis, *Gigantic Dancing Human Machine: Bang on a Can plays Louis Andriessen*, performed by Bang on A Can All-Stars (London; New York: Cantaloupe Music, 2002).
- Andriessen, Louis, *De Staat*, performed by Schönberg Ensemble, conducted by Reinbert de Leeuw (Germany: Elektra Nonesuch, 7559-79251-2, 1991).
- Andriessen Louis, *De Stijl/M is for Man, Music, Mozart*, performed by Schönberg Ensemble and Orkest de Volharding, conducted by Reinbert de Leeuw and Jurjen Hempel (Utrecht: Elektra Nonesuch, 979342-2, 1994).
- Andriessen, Louis, *De Tijd*, performed by Schönberg Ensemble with Percussion Group The Hague and Netherlands Chamber Choir (Utrecht: 79291-2, Elektra Nonesuch, 1993).
- Anthony Braxton Quartet, *The Coventry Concert*, performed by Anthony Braxton, Marilyn Crispell, Mark Dresser, Gerry Hemingway (West Wind, 2006).
- Barry, Gerald, *Gerald Barry*, performed by Nua Nós, Noriko Kawai, conducted by Dáirine Ní Nheadhra (Banff: NMC D022, NMC, 1994).
- Barry, Gerald, *Orchestral Works*, performed by National Symphony Orchestra of Irelands, Robert Houlihan (Ireland: 8.225006, Marco Polo, 1997).
- Bennett, Ed, *My Broken Machines*, performed by Decibel, Fidelo Trio, ConTempo Quartet, Garth Knox, Paul Roe (Bangor, Birmingham; London; New York: NMC, D169, 2011).
- Braxton, Anthony and Mitchell, Roscoe, *Duets* (Toronto: Sackville, 1978).
- Cage, John, *Music of Changes*, performed by David Tudor (Köln: hat[now]ART, ART 133, 2001).
- Cardew, *Memorial Concert*, performed by numerous (Queen Elizabeth Hall, London: Impetus Records, 1985).
- Cutler, Joe, *Ping!*, performed by Coull String Quartet (London: NMC, 2012).
- Davies, Tansy, *Troubairitz*, performed by Anna Snow, Damien Harron, Azalea Ensemble, conducted by Christopher Austin (London: Nonclassical, 2011).
- Fernández, Agustín, *Wounded Angel* (NMC, 1996).
- Ferneyhough, Brian, ‘Lemma-Icon-Epigram’, *Perspectives of New Music*, performed by James Avery, (Boston: Perspectives of New Music, PNM 28, 1990).
- Fitkin, Graham, *Hook, Mesh, Stub, Cud, Log, Line Loud Hard Fairy*, performed by PianoCircus (London: Decca, 473- 434-2, 2002).

- Fitkin, Graham, Wall, Ruth, *Still Warm* (England: FitkinWall, GFCD 060706, 2007).
- Icebreaker: Terminal Velocity*, executive producers Michael Gordon, David, Lang, Kenny Savelson, Julia Wolfe (New York: Cantaloupe Music, CA21031, 2002).
- Gosfield, Annie, *Burnt Ivory and Loose Wires* (USA: Tzadik, 1998).
- Gosfield, Annie, *Lost Signals and Drifting Satellites*, (USA: Tzadik, 2004).
- Martland, Steve, *Horses of Instruction*, performed by The Steve Martland Band (England: Black Box Recordings, BBM1033, 2001).
- Martland, Steve, *Patrol*, performed by The Steve Martland Band and The Smith Quartet (Pencaitland: D105803, Catalyst, 1994).
- Monk, Meredith, *Volcano Songs*, performed by Meredith Monk, Katie Geissinger, Nurit Tilles, Alison Easter, Dina Emerson (New York: ECM Records, ECM 1589, 1997).
- Morgan, Darragh, Dullea, Mary, *Opera: New Works for Violin and Piano* (Kingston: NMC, LC-03128, 2006).
- Nancarrow, Conlon, *Studies for Player Piano*, CD Box Set (Germany: Wergo, WER 6907-2, 1999).
- Palestine, Charlemagne, *Godbear* (New York: Barooni, BAR 019, 1998).
- Stockhausen, Karlheinz, ‘Klavierstück I’, *Klavierstücke*, performed by David Tudor, (Therwil, Switzerland: Hat Hut Records, ART CD 6142 1994).
- Trio VD, *Fill it up with Ghosts*, (Babel, BDV2985, 2009).
- Wolff, Christian, *Early Piano Music 1951-1961*, performed by John Tilbury, Christian Wolff, Eddie Prévost (Gateway Studios, Kingston: Matchless Recordings, 2001/2).