



Draft Programme - Subject to change

Friday 6th January, 2012 - Jacqueline du Pre Music Building, St. Hilda's College

1200 Registration and refreshments

1300 Welcome and introduction

1315	Keynote Presentation
	Professor Eric Clarke (University of Oxford)
	Distributed creativity in musical performance Professor Clarke is Heather Professor of Music at the University of Oxford and will begin SPEEC 2012 with a keynote address presenting some of the latest research from the Creative Practice in Contemporary Concert Music research group for which he is principal investigator.
1415	Research Paper
	Professor Liza Lim (University of Huddersfield)
	Tongue of the Invisible - Co-creative processes between composition, performance and improvisation A discussion of Liza Lim's <i>Tongue of the Invisible</i> , a work written for improvising jazz pianist, Uri Caine, baritone Omar Ebrahim and 16 musicians of musikFabrik (premiere Holland Festival, June 2011). The paper explores compositional relationships between constraint and freedom in a work employing improvisational strategies and various degrees of performer input in the formation of the work. Documentation of the work, from sketch to workshop stage to performance(s) including interviews and recordings, was carried out by Prof Eric Clarke and Dr Mark Doffmann as part of their AHRC-CMPCP project on 'Distributed Creativity'. This documentation forms the basis for a discussion of the ways in which the 'feedback' mechanisms that are negotiated in rehearsal between composer and performers have an impact on the final work and how performance-practice knowledge is co-created in highly interactive situations.

1445 Break

1500	Performer/composer dialogue
	Matthew Shlomowitz (composer) and Mark Knoop (piano)
	Ahead of their evening performances, Shlomowitz and Knoop will discuss and present in a joint presentation
1545	Research paper
	Ben Hebbert (University of Oxford)
	<p>An instrument maker's perspective on "building an instrument"</p> <p>In this paper I want to explore the tensions between instrument maker, musician and composer in the advance of experimental music, exploring the realities of why it has been difficult to push through the boundaries of our expected sound world, why we rarely see instruments of radical new design, and why they tend to be shortlived. At the same time I want to use historical pointers in order to understand the phenomenon of new acoustic instruments coming to market in any significant way. In particular I will be exploring recent challenges that I have faced as an instrument maker, in one instance following and being involved in design projects to create a '21st-century violin' and real experiences of presenting professional musicians with instruments that fall out of their comfort zone.</p> <p>Benjamin Hebbert is head of musical instrument making at West Dean College, where he is also a tutor for MA design, and a lecturer in material culture and history of decorative arts. He was formerly a fellow in art history at the Metropolitan Museum of Art, and European Specialist head of the musical instrument department at Christie's. He is completing a doctorate at the faculty of music at Oxford on musical instrument makers and the rise of commercialism in early modern London. He recently worked with Charles Hazlewood and the BBC Concert Orchestra making cellos and double basses from reclaimed materials for the BBC4 documentary, Scrapheap Orchestra.</p>

1615 Break

1630	Performer/composer dialogue
	Dr Sam Hayden (University of Durham) and Dr Mieko Kanno (University of Durham)
	<p>Towards musical interaction: Sam Hayden's compositions for e-violin and computer</p> <p>This paper discusses the evolution of the collaboration between violinist Mieko Kanno and composer Sam Hayden towards their goal of achieving (and defining, within a certain context) musical interactivity between electric violin and live computer processing. This process began in 2007 with the composition of Hayden's schismatics for electric violin (Violectra) and computer, involving a standard performance paradigm of a fixed notated part for the e-violin with sonically un-fixed live computer processing, using a Max/MSP patch. Hayden was unsatisfied with the early version of the piece: the use of attack detection on the live e-violin playing to trigger stochastic processes led to an essentially reactive behaviour in the computer, resulting in a somewhat predictable one-to-one sonic relationship between them. It demonstrated little internal relationship between the two beyond an initial e-violin 'action' causing a computer 'event'. The extensive revisions of schismatics in 2010, enabled by an AHRC Practice-Led research award, aimed to</p>

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	<p>achieve 1) a more interactive performance situation and 2) a more ‘musical’ relationship between live and processed sounds. This was realized through the introduction of sound analysis objects, in particular machine listening and learning techniques (ll~ object) developed by Dr Nick Collins (University of Sussex). One aspect of the programming was the mapping of analysis data to synthesis parameters, enabling the computer transformations of the e- violin to ‘respond’ more directly to the nuances of Kanno’s live performance. Whereas the use of the ll~ object was an extension of the existing Max/MSP programming for schismatics, this collaborative process is being further developed during the final phase of the AHRC award, with the composition of a new work which has the ll~ object at the centre of its design while also mapping sound analysis data to synthesis parameters. The idea of this new work is a modular, somewhat ‘open’ form, within which the computer is able to adapt musically to the changing order and nature of various sonic materials in real-time, hence achieving a further level of musical interactivity. A new piece, ‘Adaptations’ will also be discussed.</p>
1715	Keynote Presentation
	Trevor Wishart (composer)
	<p>Fresh from his residency in the Faculty of Music (supported by the Leverhulme Trust in 2011) Trevor Wishart is an award-winning composer and author, as well as a solo voice performer and improviser of extended vocal techniques.</p> <p>His presentation at SPEEC will include a discussion of new and upcoming ideas and a question/answer session with the audience.</p>

1815 End of day’s papers

1830 Conference dinner, St. Hilda’s College

'Building Instruments'
Symposium Concert - 20.00
Jacqueline du Pre Music Building

Mark Knoop (piano)

Shlomowitz - *Popular Contexts*
Ablinger - *Voices and Piano*

* *Interval* *

Mieko Kanno (e-violin), Sam Hayden (electronics)

Hayden - *Schismatics*
Hayden - *Adaptations*

Saturday 7th January, 2012 - Faculty of Music, St. Aldate's

Parallel Session 1a - Music as a dynamic relationship
 Denis Arnold Hall

0900	<p>Caroline Wilkins (Brunel University) and Oded Ben-Tal (Kingston University)</p> <p>Zaum: Beyond Mind is a sound theatre piece emerging from our collaboration as composer-performers, through which we will focus on the development process that facilitated a merging of our individual creativities. We shall demonstrate performance techniques that evolved as a result of live interaction with electronics, and our approach to integrating voice, bandoneon, and electronic sounds into a meta-instrument. Both the nature of performance practice within this genre and the aesthetic implications of our approach will be discussed.</p> <p>The work, comprising voice, bandoneon, piano and live/interactive electronics, film, choreography and lighting, explores concepts evolving from the notion of <i>instruments in space</i>. The electronics create, in effect, several other <i>extended</i> instruments. In combination with the performer, they facilitate a prosthetic extension of her instrument and voice, going beyond the physical, technical and acoustic limitations of live music. Original sound sources are modified, resulting in distant, unfamiliar, 'other' characters in this theatre of sound that exist only in the virtual world, such as the <i>electronic woman-instrument</i>. There is a close dialogue between the vocal/instrumental 'bodies' that breathe, the one physical (voice/bandoneon), the others virtual (their electronic counterparts). During performance the live vocalist/instrumentalist responds to her virtual partner(s) in a chain of overlapping sound stimuli, so that their borders cross, resulting in an indiscernible blend of multiple sonic layers.</p> <p>The flexible medium of interactive performance allows for a work to transform and grow organically over time. It further demands a re-examination of interdisciplinary documentation practices through the wider concept of Performance Composition that considers the score as a performance text. Our work addresses a fundamental shift away from traditional notions of authorship, involving a shared process made possible by the dynamic partnership of humans and machines.</p>
0930	<p>Tom Davis (University of Bournemouth)</p> <p><i>The Loop: A distributed instrument approach to networked performance</i></p> <p>This paper discusses issues around the design and construction of a multi-site collaborative instrument entitled 'the loop' that was performed with at NIME 2011 and the arts.on.wires festival in Oslo 2011. This instrument has been designed in reaction to a number of theoretical and practical issues surrounding the creation of interfaces/instruments for distributed improvisation that arose through the rehearsal process of the networked ensemble the JacksOn4 (Tom Davis, Jason Geistweidt, Alain Renaud and Jason Dixon.)</p> <p>This paper especially seeks to explore the notion of a distributed instrument and the way in which distributed instrumental design impacts on the behaviour of the participants (performer and audience); the mediation of musical expression; the bi-directional relationship between instrument design and the compositional/artistic goals of the group.</p>

	<p>Most commonly, distributed performance practice seeks to recreate traditional concert settings through the creation of a shared environment or telepresent performance facilitated through the transmission of high quality video and audio. In addition, strategies have been developed at coordinating such performances by imposing structure externally to the process, often in the form of real-time graphical scores or 'conducting' software such as Alain Renaud's <i>Frequencyliator</i>. In contrast to this approach, rather than impose top down structures onto existing instruments or attempt to recreate the sense of a traditional concert setting, this paper outlines a bottom up approach in which an instrument building practice is employed to create an instrument that works intrinsically over the network.</p> <p>The JacksOn4 have adopted a process of distributed instrument creation, such that there exists one networked multisite instrument that all the performers play. The constructed instrument entitled 'the loop' has acoustic nodes at each site that are connected by an audio feedback loop over a network, such that acoustic interactions at one site are fed into the next performers interface. Performers can then add sound to the loop or manipulate the other sounds through physical contact with their interface. This design process has been followed as a way of making the networked nature of the instrument explicit in its construction. In addition to this there is consideration of an enactive approach to instrument design that seeks to physicalise interaction as a way of communicating the effort of performance, as well as compositional and performance choices to the audience. As the performers are all performing with one instrument, which itself is intrinsically part of the network the instrument highlights the literal and social interactions that take place between the performers. The instrument itself thus mediates performance information between the players, negating the need for any score based information to provide additional visual or auditory cues. As it is intrinsically a distributed instrument, the instrument design itself conditions the interactions that are suitable for networked performance: a distributed instrument for a distributed performance.</p>
1000	Roger Thomas (Bishopsgate Institute, London)
	<p>The instrument as relationship: improvising with SARAH</p> <p><i>A description of a category of instrument which is 'built' purely as a relationship between components, existing in an unmodifiable state and only while that relationship prevails; the application of this description to SARAH, a fully realised electronic instrumental system which emulates human improvisation with a co-performer.</i></p> <p>The distinction between hardware and software instruments is undeniably convenient, but there is an argument for a third category of instrument which exists primarily as the relationship between elements in a system rather than as the system's totality; that is, as something other than an assemblage of physical parts and/or lines of code.</p> <p>One possible definition of such an instrument is that its associated components take on or revert to other identities/functions when the relationship is broken. Audio feedback is one example: if the performance system for Steve Reich's <i>Pendulum Music</i> is dismantled, the resulting collection of generic audio hardware suggests no procedure for re-creating the original instrument without recourse to the composer's instructions, since the sonic element is in fact the audio feedback brought into existence when this hardware is configured in a particular way. However, dismantling a cello used in the performance of a Bach prelude produces a pile of highly</p>

specific cello components which have no other designated function and which include, in the form of the instrument's strings, the actual source of its sound. Unlike Reich's audio hardware, the cello is literally the sum of its parts, just as a Max/MSP patch is the sum of its code.

SARAH (Semi-Autonomous Reactive Accompanist Hardware) is a transactive instrumental system developed by the author which works within an unusual (for a non-human musician) set of musical parameters in an attempt to model human participation in free improvisation. This process is a product of SARAH's existence as an instrument that has been 'built' only as a relationship between, in this instance, a set of hardware devices; furthermore, unlike other instruments, SARAH cannot be directly modified (the elements between which the relationship exists can be modified, but not the relationship itself). Each device in the system has a specific pre-existing purpose unrelated to SARAH. There is no hardware 'black box' or software program/patch called SARAH and, as with Reich's feedback, if the system is disassembled there is no residual evidence of SARAH's existence, yet the instrument functions and has very specific characteristics.

A performance will usually entail a single musician playing live with SARAH in real time. Unlike captured (live sampled/looped) or pre-recorded material, both of which are routinely used in improvisation, SARAH's response to a human performer is not repetitive, predetermined or chaotic. Capture and playback systems can be manipulated in live performance to an extent but they cannot be induced to improvise an idiosyncratic, real-time response to external musical input which is unpredictable yet also demonstrably 'intentional' and musically credible. SARAH, by contrast, does exactly this. SARAH is most easily provoked into action by complex material; favoured sources include processed digital percussion, live DJ mixes and Ross Bencina's AudioMulch software. (RT 11.09.11)

1030 Break

0900	Alexander Refsum Jensenius (University of Oslo)
	<p>Motion Capture in Musical Performance</p> <p>Motion capture is becoming increasingly popular in interactive music performance. By motion capture I here refer to all sorts of technological systems that can track the position/motion of a body/object in space over time. This can be anything from widely accessible commercial systems, e.g. Nintendo Wii and Microsoft Kinect game controllers, to large laboratory systems, e.g. from Vicon, Qualisys, Optitrack, Xsens. Even though such systems are based on different types of sensing technologies, many of the underlying challenges of using them in musical practice are similar:</p> <ul style="list-style-type: none"> • setting up and calibrating the system • doing the actual capture of position or motion • pre-processing the data through various types of filtering • representing the data in a (meaningful) format • communicating the data to a sound/music engine • creating interesting and/or meaningful relationships between motion features and intended sound/music features. <p>While there are numerous research and engineering challenges related to all of the above mentioned points, I will in this presentation focus mainly on the last of these: the creation of relationships between motion and sound, or what is often referred to as the challenge of mapping. The question of mapping is not only the practical challenge of “translating” motion to sound when creating interactive systems. In my opinion mapping touches upon fundamental aspects of our cognition of what I call action-sound and sound-action relationships. I will argue that our experience of such relationships is based on ecological knowledge, and that the development of “artificial” action-sound relationships in electronic systems should take this embodied experience into account.</p> <p>In the talk I will present an overview of a series of observation studies we have conducted to understand more about people’s spontaneous movement to musical sound. I will argue that such systematic studies are useful for creative practice, as a support for the typical trial-and-error approach which is commonly used when developing interactive systems today. This will be exemplified through the presentation of some different artistic projects I have been involved in where motion capture systems have been used to control the interaction: a) Laser-dance for 4 dancers, laser and one infrared sensor, b) Transformation for electric violin and video-controlled live electronics, c) Dance Jockey for full-body motion capture suit, d) Swarm for high-speed/resolution infrared marker-based motion capture.</p>
0930	Martin Blain (Manchester Metropolitan University)
	<p>Issues in instrumental design: the ontological problem (opportunity?) of ‘liveness’ for a laptop ensemble</p> <p>Through the recent work of MMUle (Manchester Metropolitan University laptop ensemble), an ensemble set up to explore composition, improvisation and performance practice within the context of interdisciplinary arts practice, this paper will explore issues in new instrumental design for live</p>

	<p>performance. For MMUle, the intimacy of the interaction between human and machine is exposed through live performance and this has resulted in the relationship between musician and machine being in a process of constant negotiation. Subsequently, the paper will consider some of the technical approaches and performance strategies MMUle has developed in an attempt to better interact with technology through the design of new instruments for musical performance. It will consider the relationship between the musician and the computer as musical instrument; it will consider the causal relationship between performative action and resulting sound, which has remained an issue for some spectators of music laptop performances and will explore this in light of MMUle's approach to expand the affordance of the laptop computer in relation to its musical and performative potential; and some consideration will be given to the use of interface devices such as the computer program MaxMSP, the games controllers x-box and Wii, and the human body as MMUle attempt to interact with machines.</p> <p>The paper will then discuss some of the implications and applications of developing new software instruments for performance. This will be explored through two pathways to 'liveness': performance as an experienced 'live' event and 'liveness' considered as a compositional strategy.</p> <p>In relation to 'live' performance, Peggy Phelan's (1993) suggestion that the 'real' 'becomes itself through disappearance', and Philip Auslander's (1999) proposition that there may be no 'clear-cut ontological distinction between live forms and mediatized ones' provide a useful point for departure. In addition, the paper will draw on positions of 'liveness' from Susan Broadhurst (2007), who suggests that new performance strategies have emerged that 'prioritize' the application of new technologies, and Freda Chapple and Chiel Kattenbelt (2006), who suggest that 'intermediality' is the dominant trend in arts practices. The paper will consider these approaches to 'liveness' and how they have impacted on MMUle's approach to the development of instrumental design and performance.</p> <p>In addition, the paper will consider how these approaches to the development of instrumental design have impacted on the compositional strategies at play in the work of MMUle. As Cascone (2000) suggests, 'Falling into neither the spectacularized presentation of pop music, nor the academic world of acousmatic music, laptop musicians inhabit a netherworld constructed from performance codes borrowed from both'. The paper will conclude by offering an alternative position for the laptop musician working with 'live' and 'mediatized' sounds through performance.</p>
1000	Brian Lock (Royal Holloway University)
	<p><i>Music for iPad, Flute, Birds and Memoryscapes</i></p> <p>I propose to present a paper based on the issues connected to my new composition; <i>Music for iPad, Flute, Birds and Memoryscapes</i>. The issues I would like to cover include those concerning the composition of this experimental piece, its performance and its context.</p> <p>I propose to deal with the original choice and idea of using the iPad and the aesthetic and technological challenges that brings. Issues include why I decided to use a piece of mass -market kit and not build an instrument of my own, and indeed, how I view it in contrast to the turntable for example. To do this I will set the piece in an artistic context, which is one of experimental 'fusion' of contemporary, electronica and commercial composition.</p>

The 'fusion' here is not just one of musical styles but also of trying to find anew and recast previous practice in musical performance, soundworlds and music's interaction with image and screen. These things manifest themselves in the 'fusion' between, for example, a classical instrument, the flute, with a contemporary technological one, in this case, an iPad. Similarly, as far as soundworlds are concerned, between the highly electronic genres and bird song (both electronic, recorded and mimicry from the flute) and, in terms of image, from the iPad itself displaying musical information combined with additional images of landscapes, birds and other items.

These 'fusions' and the 'problems' and issues they throw up in compositional, technological and aesthetic terms will form the bulk of the presentation. I intend to talk about these but I will illustrate them with examples from this piece and from previous pieces of mine which were also created on aspects of the research which have fed into this piece, such as the *Sonata for Cello and Mixing Desk*.

Whilst mainly dealing with the issues I have encountered compositionally I will also deal with the research context and stylistic background of the piece including my building creatively on ideas from zoomusicology; ideas from other composers who have added to recent developments in working with screen or screens such as Max de Wardener, others in combining live electronics with acoustic instruments like Supersilent and David Sylvian and those using non-classical technology such as turntables with otherwise standard western instrumental set-ups such as Gabriel Prokofiev in his *Concerto for Turntables*. I will also touch on some of the ideas concerning memory and landscape facilitated in this piece by the use of an iPad as instrument. Hopefully, through highlighting and discussing the many 'issues' in the piece I will be able to show overall how the piece is adding to the discourse in all these areas.

1030 Break

1130	Martin Vishnick
<p data-bbox="240 409 975 443">Exclusive usage of extended guitar techniques</p> <p data-bbox="240 477 1503 813">This presentation will center on the morphology of guitar sounds. The intention is to present guitar music that has been constructed exclusively through using only extended techniques. Ideas have been abstracted from my <i>Guitar Treatise</i>, a resource comprising both developments of existing techniques and techniques invented by myself. It comprises two Volumes. The main focus for Volume I is on providing a context for the existence and development of guitar morphologies, Volume 2 comprises studies. The underlying aim is to develop a contemporary sound language for the instrument and provide musicians with a sound repertory for compositions and improvisation.</p> <p data-bbox="240 853 1503 1021">After an explanation of the <i>Guitar Treatise</i> contents, which includes linking to significant research and key repertoire, archetypal and variant morphologies, the principles of structuring and integrating these sounds, instruction on the studies, and the notation system used, I will perform some appropriate music.</p> <p data-bbox="240 1059 1503 1328">The archetypal morphology of guitar sound - attack/resonance - forms the basis for classifying the techniques <i>natural</i> and <i>multiphonic harmonics</i>, <i>snap pizzicato (Long)</i>, <i>soundhole resonances</i>, <i>bi-tone tapping (Long)</i>, <i>mute tapping (Long)</i>, and <i>nut-side</i>. The techniques <i>bottleneck</i>, <i>snap pizzicato</i>, <i>cross stroke</i>, <i>'snare drum'</i>, <i>rapid mute</i>, <i>bi-tone tapping</i>, <i>mute tapping</i>, and <i>pinch mute</i> can be regarded as variants or extensions of the archetypal morphology. Diagrams will be used to illuminate guitar morphology. They have two functions:</p> <ol data-bbox="240 1366 1503 1503" style="list-style-type: none">1 Draw attention to the temporal evolution of spectra and pitch-to-noise content produced by playing particular techniques.2 Show how the combining of morphologies results in the integration of spectral components, creating more complex sound qualities. <p data-bbox="240 1541 1503 1809">Musical potential of the techniques are explored in the two sets of studies, both through the juxtaposing and the merging of morphologies. The player is encouraged to work towards an awareness of the subtle intrinsic nature of resonances, where the spectral content of several morphologies is frequently blended, to the extent that participating morphologies are sometimes not aurally separable. The first twenty-eight studies focus on individual techniques, while the remaining six studies are centred on combining techniques.</p> <p data-bbox="240 1848 1503 1944">For the performance section of the presentation, I will present all the techniques in a brief and musical fashion before playing one of the more advanced studies.</p>	

1200	Scott McLaughlin and Iain Harrison (University of Huddersfield)
	<p>Wind instrument multiphonics are becoming more prevalent in contemporary composition (almost to the point of cliché), and despite improvements in performance technique, fluency, and understanding, they still present considerable difficulties for the performer and composer. As a subset of these performance issues, there are competing schools of thought on the most basic question of notation in multiphonics, is it meaningful or practical to notate specific pitches or specific multiphonic fingerings? and to what extent is it even possible to generalise. In my own compositional research I have mostly concluded that it is not meaningful, but this is from the perspective of my particular compositional concerns and is not universally applicable.</p> <p>In this presentation I will examine several case studies from contemporary repertoire that demonstrate varying approaches to multiphonic notation, and in using multiphonics as compositional material [with the assistance of saxophonist/researcher Iain Harrison]. I will also present my own compositional research 'there are neither wholes nor parts', an open form piece for woodwind multiphonics that obviates the need for specific pitch/fingering indications. This piece and several others approaches multiphonics as a compositional material that is necessarily unpredictable. My research posits the instrument as a chaotic attractor with each multiphonic fingering acting as a force towards specific basins that can generate certain frequency/amplitude outputs with varying inputs (breath pressure, embouchure, oral cavity shape etc.), and with varying levels of stability.</p>
1230	Eleri Ann Evans (University of Huddersfield)
	<p>Can you still hear me? An exploration into the dynamic capabilities of the saxophone</p> <p>Contemporary composition has called upon the modern instrumentalist to resolve numerous performance issues arising from the ever expanding dynamic range demanded of the saxophone. This paper will cover the ultimate possibilities in both quiet and loud performance on this single reed wind instrument.</p> <p>Investigation into the area between the boundaries of silence and the beginning of sound will follow the corporal experience as a player, feeling vibrations from the instrument, and the other physical aspects of consummate breath and digit control.</p> <p>The physical limits of the performer and the instrument will be considered both in acoustic performance and also following amplification. The subsequent route, bringing music to the edge of noise through such amplification, will also be scrutinized.</p> <p>Technical difficulties can often overshadow the performance of such absolute dynamics and therefore must be addressed. Relevant technical and material aspects such as suitable amplification and adjustments to the instrumental build will be examined and evaluated.</p> <p>Recent examples of compositions featuring extreme dynamics will also be discussed.</p> <p>This research has instigated an exploration into the real limits of both performer and instrument, and emerging from that a new style and manner of saxophone playing has been developed uncovering the true potential of the instrument.</p>

1300 Lunch

11:00	James Saunders (Bath Spa University)
	<p>Specific objects? Distributed approaches to sourcing sonic materials in open form compositions</p> <p>Open instrumentation is a common feature of many indeterminate compositions, whether they use stave, graphic or verbal notation. This paper examines the strategies used in some of my recent work for obtaining and using materials and objects as instrumental resources, focusing on maximising variety within carefully prescribed boundaries. In <i>surfaces</i> (2010-11), the score provides instructions for specific actions, but leaves open the choice of materials to which they are applied, suggesting broad categories within which the sonic properties may be explored. The operations gradually transform and degrade the materials, emphasising their impact on the nature of the specific realisation. In <i>things whole and not whole</i> (2011), each orchestra member sources noise sounds using either a standard orchestral instrument or found materials. The resulting range of diverse-but clearly specified--sound types is a product of distributed choice. In <i>imperfections on the surface</i> are occasionally apparent (2009), the ten performers each use the same means of eliciting sounds from surfaces; each performer must source five surfaces that are different to those of the other ensemble members. These exemplars will be discussed, focusing on how carefully constrained individual decision-making when selecting sound resources by those realising a score might be considered as a possible mechanism for generating sonic variety.</p>
1130	Richard Hoadley (Anglia Ruskin University)
	<p>Notating Algorithms</p> <p>Notation is a central issue in modern western music. Composers have often sought ways of expanding and refining the functionality of notation and in doing so they have re-shaped the very music they were originally aiming to describe. Many other musical traditions have used notation very differently, or have used no notation at all and in the process have created highly differing musical experiences.</p> <p>The developing role of electronics and computers in music has both questioned and influenced the nature of notation and its function. More traditional 'live' notation of note/pitch-based music generated algorithmically has proved particularly problematic: musical notation is itself a very complex subject. Instead composers and technologists have used libraries of images, algorithms for the pre-generation of material or simplified notations that can be used as the basis of a more improvisatory performance.</p> <p>This paper, which will include practical demonstrations, presents work involving the live presentation via (computer) screen of 'traditionally precise' music notation created from algorithmically generated musical material. This notation can then be performed by a human musician alongside the same computer generated material (or indeed other 'real' musicians). Technologies used include the SuperCollider audio programming environment, OSC and the INScore notation project. As well as providing a fascinating and creative musical experience, the process highlights a number of issues concerning performance practice, instrumental technique, rehearsal, time and timing, as well as the nature of notation itself and its relationship to improvisation.</p>

1200	Ian Burleigh (University of Lethbridge, Canada)
	<p>Computer-assisted Tone Arrangement Using Calculated Consonance</p> <p>Music can be possibly defined as “the art of combining tones ... in succession (melody) and simultaneously (harmony)”. This paper discusses an experimental computational method for such tone combination, and presents a software application that puts the method to use.</p> <p>The method is based on Helmholtz’s observation that the perceived dissonance of simultaneously sounding complex tones is due to beats between their partials, that cause a rough sensory sensation. Dissonance among a group of tones, with one tone adjustable in pitch and the rest fixed, can be plotted as a dissonance curve with peaks of maximum dissonance and valleys of relative calmness – local consonance minima. The tone with adjustable pitch can be then fixed in one of the valleys and be harmoniously related to the rest.</p> <p>Consonance thus calculated is directly related to just intonation. Just intonation inevitably leads to more than twelve pitches in one octave. The demonstrable optimum (short of the pitch continuum) is the 53-tone equal division of the octave.³ Arranging tones and playing music in 53-division is beyond the ability of human composers and interpreters, but is a natural field for computer- assisted composition, and for playback by electronic or electronically-enhanced instruments and humans.⁴</p> <p>The method calculates how the dissonance evolves in time, and constructs a three-dimensional dissonance landscape (pitch × time × dissonance). The landscape is initially formed by arbitrarily selected tones (polyphonic voices, bass line + chords, and such) that define a harmonic plan, and further molded by the contribution of added tones.</p> <p>Next, melodic gestures (curves in the pitch × time continuum) are superimposed over the dissonance landscape. The gestures can come from an outside source (painted in a graphical user interface, or as data received from control devices), or be generated computationally, for example as a result of simulated physics. Tones that comprise a gesture (granulated on the 53- division pitch grid) are microtonally adjusted in such a way that their contribution to aggregate dissonance is locally minimized. In more restricted mode, the dissonance minima values are offered to the user of the system, who then uses them as material to form melodic motifs.</p> <p>The result is a musical texture that, while quite freely formed, strongly adheres to principles of harmony, as they are dictated by psychoacoustics. Enclosed are two test etudes, created with a use of the method. Both are based on a harmonic plan taken from a shortened version of J.S. Bach’s Prelude in C, BWV 846:</p> <ol style="list-style-type: none"> 1. Farmer’s Fuguetta: A 53-division polyphonic exercise in arranging folk-tune quotations, shaped and guided by the calculated dissonance landscape. 2. Genaues Glockenspiel: A simulated physical environment with several bodies that attempt to follow a suggested simple gestural curve, while affected by mutual attractive and repulsive forces, and by their own inertia. Their traces in the pitch × time space are forced to conform to the dissonance landscape.

1230	<p data-bbox="240 98 954 129">Robert Bentall (Queen's University, Belfast)</p> <p data-bbox="240 165 1445 197">Dislocated Gesture: Composing with Dynamic Shape in Acousmatic Composition</p> <p data-bbox="240 232 1503 882">This paper aims to explore the relationship between gesture and electroacoustic music, particularly the acousmatic genre. Gesture is a term associated with human action – with regard to instrumental performance, the human performer provides the agent for musical sound to occur. However, gesture is still a prominent feature of acousmatic composition; the work of David Berezan, Manuella Blackburn, myself and many other acousmatic composers demonstrates this dislocated gestural relationship, in which strong musical shaping occurs with no visible human action. In this paper and in my compositions, I refer to musical gesture in an extreme sense; that of very sharp dynamic shaping in acousmatic compositions. However, the first question that I must pose is that how gesture is construed within the context of various forms of contemporary music is flexible. In instrumental contemporary music, the visual/aural relationship may be of particular interest. In soundscape composition, small gestures of natural environmental sounds may become more prominent. In electroacoustic music with instruments, it may revolve around the relocation of live gestures to pre-recorded ones. In acousmatic music, gesture has an increased ‘shock factor’ due to the dislocation visual cues and aural cues; a listener does not have the performer available to detect dynamic shape as it occurs.</p> <p data-bbox="240 918 1503 1500">I will be contextualising the use of gesture within acousmatic music by discussing Berezan’s <i>Baoding</i> (2003), Blackburn’s <i>Casual Impacts</i> (2007) and my own works <i>Vanity Procedure</i> and <i>Cyan</i>. These works all make very explicit use of sharp dynamic change, thus creating a point of departure for other sonic materials. In <i>Cyan</i>, clear-cut gestures are used to structure the first half of the piece by using them as a point of departure, before the music is able to settle; the inherent relationship between tension and release in music is also highlighted by the use of gesture. In this piece, I also explored the dislocation of instrumental gesture with my source recordings of the Viola Da Gamba that were used in the piece. The use of gesture is strongly related space within the genre; recording techniques, spatial processing and multi-channel composition all map onto aspects of musical gesture. In <i>Vanity Procedure</i>, wide stereo recordings of tearing gestures were made in order to enhance the horizontality of the gestural shapes. I conclude that within acousmatic music, gesture is a very physical yet visually dislocated musical parameter, and a very interesting one to work with to structure music in the genre.</p>
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Lunch 1300

1400	<p>Samuel Wilson (Royal Holloway University)</p> <p>Building an Instrument, Building an Instrumentalist: Helmut Lachenmann’s <i>Serynade</i></p> <p>“Building an instrument” is no neutral thing – in the creation of the new is an inherent confrontation with tradition and the “natural” way of things. I explore this idea through examining performance techniques and musical meaning in Helmut Lachenmann’s <i>Serynade</i> for solo piano (1998, revised 2000). I argue that in this work Lachenmann uses the instrument not simply as “a piano” but as a pianistic resource from which to build a new instrument and new experiential relationships to it. A problematisation of pedagogy – of the established relationships between instrument and instrumentalist – is a recurring motif of Lachenmann’s music. This returns in <i>Serynade</i>, something allowing him not only to build an instrument, but an instrumentalist also, reconfiguring the handed-down embodied relationships that exist between player and instrument. Drawing on Maurice Merleau-Ponty’s phenomenology of embodiment, I show that implicit to building instruments are encounters with wider aesthetic and historical questions – particularly of the relationships between the body and technology as they mutually mediate one-another.</p>
1430	<p>Luk Vaes (Orpheus Institut, Gent)</p> <p>Revisiting the Luthéal and Prepared Piano to bring the original repertoire back to the stage</p> <p>To short-cut the way towards accessing new sounds, composers sometimes experiment with ways to build a new instrument out of an existing one. Both the Luthéal and the prepared piano are the results of such compromises: by muting the strings with objects, the characteristic monochrome piano sound could be left behind while still taking advantage of the piano’s widespread presence on the concert stage and the performer’s hard-won familiarity with the keyboard interface.</p> <p>As promising as this type of instrumental mutation may look, and as successfully as composers have written for these particular instruments, the relevant repertoire is severely lacking on the concert stage, today. Only very few people can enjoy Ravel’s <i>Tzigane</i> or Cage’s solo prepared piano pieces live and in their original version, compared to the countless that cherish these works.</p> <p>This presentation elaborates on an artistic research aimed at finding solutions to the performance practical problems that prevent today’s pianists from performing this repertoire properly on the concert stage. Combining both musicological and performance practical methods, ways and attempts are shown to emulate the Luthéal on a normal piano, and to reconstruct the lost information that is needed to secure the stage future of Cage’s prepared piano pieces. For composers, warning as well as encouragement are part of the insights that can sustain the proper type of faith in this type of instrumental innovation. In the mean time, some surprising insights with regards to the composition and chronology of these famous compositions are accumulated.</p>

1500	Sarah Nicolls (Brunel University)
	<p>In this presentation, Sarah Nicolls will discuss the issues surrounding the development of the piano and why she believes it shouldn't stop where it is. There are several key moments in the instrument's history which have enabled performance practice - or the broader development of musical language - to instruct how the piano should be re-invented. However, for well over a century now, the instrument has been basically the same, with only minor tweaks here and there (Nicolls will also give details on these, including less well-known features such as how the resonance in small grand pianos has been extended by one particularly innovative UK-based company).</p> <p>Ultimately Nicolls argues for a cohesion between twenty-first musical demands from composers with the 'performance environment' of the piano'. This entails consideration of access to the inside of the instrument, as well as a secondary (possibly less universally demanded but as important) aspect - the housing of technological additions, for use in amplified or interactive performance. The latter has been a main feature of Nicolls' work over the last five years.</p> <p>Nicolls will give examples from several different composers and pianists' work, as well as her own, and also show footage of her own self-designed and built 'Inside-out piano'. She will give her experienced performer's perspective on instrumental development and give the listeners present a tangible sense of why a major structural re-invention is she feels now entirely relevant.</p>

1530 Break

1545	<p data-bbox="240 241 794 275">Laura Zattra (University of Padua)</p> <p data-bbox="240 309 1430 376">Analytical and philological approaches to the study of <i>A Pierre</i> (1985) by Luigi Nono: A Collaborative Approach to Composition</p> <p data-bbox="240 416 1501 584">In this paper, we discuss the generative process of one of Luigi Nono's last works <i>A Pierre. Dell'azzurro e silenzio, inquietum</i> (1985), for contrabass flute, contrabass clarinet and live electronics. This composition is an excellent example of a collaborative project, bringing together musicians, sound engineers and technician under the guidance of the composer.</p> <p data-bbox="240 622 1501 1200">With electroacoustic compositions, both the creative process and the work are often difficult to analyse because the music cannot be set in conventional notation. With regard to Nono's late work involving live electronics, this problem is exacerbated because of his growing disinterest in fixing his works in a definitive written form [1]. During his last ten years, he preferred to leave an increasingly large, albeit carefully defined, space within which his musicians could play an active role in creating the work. The problems that arise for those wishing to study this music can be alleviated through source criticism. A philological approach requires the analyst to gather all known sources pertaining to the creative process: composer's working documents, letters, memos, program notes, audio-visual source material, interviews with collaborators and the final score [2] [3]. The study of this material allows the musicologist to better understand how performers, sound engineers, technicians and the composer collaborate to produce new music in this medium [4]. It also allows for an examination of the compositional strategies and the aesthetic characteristics of this new music in the context of what Rosalind Krauss has defined as the 'post medial era'[5].</p> <p data-bbox="240 1238 1501 1574">Our paper will report on the exhaustive study of source material pertaining to Nono's <i>A Pierre</i> that we have undertaken within the framework of two research projects: 'Plotting sound displacement and seeking virtual voices in Luigi Nono's late work' funded by the Social Sciences and Humanities Research Council of Canada and 'COEM: Cooperative Electroacoustic Music', funded by the University of Padova. In our paper we will focus on the innovative musical outcomes that Nono was able to achieve by working with musicians, engineers and technicians in a collaborative environment. We believe that our work will provide both insight and tools, which will contribute to a better, more thorough understanding of this music in the future.</p>
1615	<p data-bbox="240 1615 1023 1648">Isabel Stoppani de Berrie (University of Oxford)</p> <p data-bbox="240 1682 1086 1715">Acoustic Synthesis: The Ensemble as Super-Instrument</p> <p data-bbox="240 1753 1501 1989">Music which focuses on the extension of the sonic palette draws on the concept of the traditional instrument in diverse ways. In counterpoint with the development of virtual, computer-synthesised 'instruments' and the use of extended techniques, certain recent composers have exploited combinations of acoustic instruments to project extended and enhanced versions of the properties of single instruments, thus creating what might be metaphorically described as 'super-instruments'.</p> <p data-bbox="240 2027 1501 2087">In a striking example, composers have used multiplication to enable us to experience the qualities of acoustic instruments in a new way. Elliot</p>

	<p>Schwartz, for instance, has spoken about producing the effect of a ‘super-instrument’ by using several instruments of the same family. This includes pieces such as <i>Pentagonal Mobile</i> (five pianos), <i>Aerie</i> (six flutes), <i>Reflections</i> (five bassoons and contra-bassoon), <i>Alto Prisms</i> (eight violas), and <i>A Riot of Reeds</i> (clarinet choir). This technique allows the instrument to be heard in all its aspects at once as though traditional time has collapsed (as in the paintings of Picasso). Horatiu Radulescu has also employed combinations of the same/similar instruments in his <i>Credo</i> for nine celli as well as other multiplied such as <i>Byzantine Prayer</i> for forty flautists. Another composer frequently using multiples of the same instrument is Lois V. Vierk, as in <i>Cirrus</i> for six trumpets and <i>Simoon</i> for eight celli. Steve Reich’s <i>Counterpoint</i> series combines live performances with multiple layers pre-recorded by the same performer, thereby achieving an even closer sense of a single instrumental identity.</p> <p>Music for solo instrument and electroacoustic tape or live transformation can also be read in this way where the electronic sounds are derived solely from the instrument. This can be seen in the piano and tape music of Elliot Schwartz. As well as featuring a solo cello with cello ensemble in <i>Messagequiste</i>, Pierre Boulez has employed a solo MIDI flute with two ‘shadow’ flutes in <i>...explosante-fixe... I</i> will also discuss <i>Anthèmes 2</i> for violin and electronics, developed from Boulez’s previous piece <i>Anthèmes</i> for solo violin. Pieces for solo instrument and electronics by a wide range of other composers (including Kaija Saariaho and Gérard Pape) can also contribute to our reflections on this medium.</p> <p>In music by ‘spectral’ composers, more diverse ensembles also mirror the sound characteristics of specific instruments. In the celebrated opening of <i>Partiels</i>, Gérard Grisey’s technique of producing altered and magnified version of trombone sound characteristics with other instruments of the orchestra, arguably leads to the ensemble’s functioning as an ‘extended’ trombone (a point made by François Rose). Tristan Murail has cited piano and bell sounds as having the kind of spectra (that is, inharmonic) that Grisey found most interesting for such instrumental synthesis.</p> <p>Considering these tendencies as related strands, and as an evolving dialogue with corresponding techniques in computer music, I will examine how such compositions construct new ways of understanding and experiencing familiar acoustic instruments. I will also consider how acoustic synthesis might be perceived by listeners, and how both the global strategies for synthesis and the details of their working-out may highlight interesting distinctions between the musical approaches of the composers discussed.</p>
1645	John Dack (Middlesex University)
	<p>Instruments from an instrument: Schaefferian ‘instrumental analysis’ and Berio’s ‘Sequenza V’ for solo trombone</p> <p>In book I of his ‘<i>Traité des objets musicaux</i>’ (Treatise on Musical Objects) Pierre Schaeffer examined the ontological nature of the ‘instrument’. Two chapters were dedicated to analyzing the relationship between the physical source and the sound structures produced by playing the instrument. These speculative chapters are ‘<i>Le préalable instrumental</i>’ (The Instrumental Prerequisite) and ‘<i>Jouer d’un instrument</i>’ (Playing an Instrument). Schaeffer’s analyses demonstrate unequivocally the intention to generalize his research originating from studio-based experiences and apply its principles to all music, instrumental or electroacoustic. Schaefferian theory acknowledges that the studio environment and its practices challenge the</p>

instrument's status. However, the materiality of sound still encourages (and perhaps even demands) an elaboration and assimilation of instrumental thought rather than its outright rejection. According to Michel Chion, the instrumental fact is '(...) the first fact of all traditional music, its concrete basis, a precondition even to musical systems and languages' (Chion, 1983: 54). Perception inevitably seeks to abstract structures from sound's concrete characteristics. These abstract structures result from the physical constitution of the instrument and the manner of the player's interaction. New musical languages emerge from such developments. The abstract/concrete dualism, which was of fundamental importance to the evolution of musique concrète, can be applied with equal success to 'virtual' or (to use Schaeffer's terminology) 'pseudo-instruments' which exist solely as perceptual constructs. Thus, the three elements of Schaefferian 'instrumental analysis': 'timbre', 'registers' and 'playing' can transcend physical source and action. They are, furthermore, particularly suited to an analysis of contemporary instrumental techniques.

My paper will use Schaefferian 'instrumental analysis' to investigate the multi-instrumental potential of a solo instrument: the trombone. The work I have chosen as an exemplary case study is Luciano Berio's 'Sequenza V'. Berio claimed: '(...) I have never tried to alter the nature of the instrument, nor to use it 'against' own its nature' (Dalmonte & Varga, 1981: 92). Although it is undeniable that Berio's composition requires virtuosity, this is always grounded in recognisably traditional techniques. I shall apply the Schaefferian concept of the 'genre' to analyse the variety of sound families that Berio elicits from the trombone. The 'genre' for Schaeffer clarified the tension between the general 'timbre' displayed by an instrument and the particular 'timbre' of each individual sound. The 'genre' groups sounds together on the basis of common perceived characteristics. Thus, an instrumental 'timbre' can comprise many distinct 'genres' each with its own registers. Moreover, 'genres' will overlap and fragment. Berio's 'Sequenza V' is a masterpiece of the control and exploitation of such 'genres'. My analysis of Berio's language will be based on the score and, most importantly, the perceived sonorous qualities of the sounds themselves.

1545	James Mooney (Leeds University)
<p>The Instrument is the Score: Contemporary and Historical Perspectives on the Relationships between Instrument, Score and Performer</p> <p>In an interview broadcast in 1973 the members of the English experimental music group Gentle Fire discuss the 'gHong', a multi-player electro-acoustic instrument comprising a metal frame fitted with springs, contact microphones, and other electronic apparatus. Richard Bernas, one of the members of Gentle Fire, says: 'The instrument is the score of what we are playing.'</p> <p>The idea that 'the instrument is the score' challenges the conventional ontological distinction between those two things. The statement can be quite easily understood, however, if one considers the instrument and the score simply to be two kinds of tool that are used to shape music in some way. In this simplified respect the instrument and the score are indeed 'the same thing'. In a recent publication¹ I defined a 'framework' as 'any entity, construct, system or paradigm that contributes in some way to the composition or performance of music'. Thus, instruments and scores are both musical frameworks.</p> <p>An instrument shapes musical output because its acoustic properties define a sound-world and its physical design defines the range of possible interactions with it. A score shapes musical output by presenting a stimulus (graphic, verbal, aural, etc.) which, through its formal and conceptual design, offers itself open to interpretation as a set of instructions, as it were. From this standpoint, any object that can generate sound qualifies as a musical instrument; any stimulus that is apt to be interpreted (whether strictly or loosely) as a set of instructions qualifies as a musical score. To put it more simply: anything can be an instrument, and anything can be a score.</p> <p>The essentially arbitrary nature of instruments and scores is embodied in the notions of the 'found instrument' and 'found score'. A found instrument is simply an every-day object, found, and repurposed as a musical instrument. A found score is an every-day object repurposed as a musical score. Both techniques were explored by the late Hugh Davies, also a member of Gentle Fire.</p> <p>Instruments and scores are differentiated by the particular affordances and constraints that they present to the performer: in plain English, the things they allow (affordances) and do not allow (constraints) to happen.² That affordances and constraints are the very essence of all musical frameworks, and that this can in turn raise ontological questions in the domain of music-making, is the underlying theme of my presentation. I will illustrate this with reference to both historical and contemporary examples, the intention being to provide a theoretical and ontological background against which the idea of 'building an instrument' can be considered.</p>	

1615	Lauren Hayes (University of Edinburgh)
	<p>Haptic Augmentation of the Hybrid Piano</p> <p>One of the most vital feedback systems that has been embedded in musicians for centuries is that of physical response. In the same way that auditory feedback is ubiquitous, and moreover <i>necessary</i> throughout performance, a performer will reassess their playing continuously by making use of the <i>tangible</i> feedback that is relayed to them through the body of their instrument. Over the last three years I have been developing a hybrid instrument: a digitally augmented piano that can sit just as well within an improvisational setting as it does as my instrument of choice for performance of compositions involving live electronics. However, throughout my research it has become apparent that the <i>feel</i> and the palpable sense of the <i>physicality</i> of the sound of this hybrid instrument is just as important as the interaction design and the translation of physical gesture into corresponding changes within the software. Thus, when I perform, the physical feedback that I receive from the instrument should convey information about the <i>whole</i> sonic output, and not just the acoustic sound. In the case of a hybrid piano, its acoustic resonance is naturally felt through the hands and body, along with the pressure that must be used to play each key. There is no similar method of tangible perception of the digital sound.</p> <p>This paper discusses the development of a vibrotactile feedback system that I have designed to further extend the already augmented piano. Tiny vibration motors are placed on the hands of the performer to allow them to perceive various types of information throughout play. Unlike Marshall and Wanderley's approach, where vibrotactile feedback is embedded in the digital musical instrument itself, to make it feel more like an acoustic one, I am suggesting that the artificial feedback may be used to convey more than just a physical representation of the audio: there may be other dimensions within the <i>black box</i> that we wish to embody. Two musical works will be presented which use this approach: the first explores the use of haptic feedback as a signaling system for the performance of a composition involving a timeline, or score, the second example uses this private and intimate information channel to transmit cues between improvising musicians. The latter method was developed in Edinburgh with Christos Michalakos. Finally, I will propose that, rather than just an important performance tool, this information feedback system allows the performer, instrument and environment to be more closely coupled, and indeed significantly influences the musical outcomes.</p> <p>Keywords: haptics, vibrotactile feedback, improvisation, performance, augmented instruments.</p>
1645	Simon Waters (University of East Anglia)
	<p>The VPFI (Virtual/Physical Feedback Instrument) Flute: A Performance Ecosystem</p> <p>The project is the latest of a long-running series of investigations into different technological interventions into instrumental composition, begun with AfterImage (1993) for baroque flute & tape, continued by Trace (2000) for clarinet, piano and concealed CD player, and Melt (2006) for marimba & live electronics, and the installation Proxemics: The world is a deaf machine (2006) for loudspeakers, I-Pods and audience. The project represents one of the first instances of public use of Michael Casey's Soundspotter technology (using real-time MPEG7 analysis to allow 'instant' matched responses to performed input) in public performance.</p>

17.15	Keynote Presentation
	Professor Leigh Landy (De Montfort University)
	<p>music Technology, Music technology or Music Technology?</p> <p>This presentation will focus on the challenge posed by the expansion of what can be said to be 'musical material' due to developments in working in the electroacoustic domain. While the concept of 'musical material' primarily raises aesthetic questions, it is the expansion of this concept which has brought about developments of a more practical kind. For example, new methodologies for understanding musical structure have developed, to some extent in combination with the evolving forms of electroacoustic performance. This is demonstrated in the rapid development and diversity of performance situations including spatialisation, virtual networks, newly devised controllers and interfaces, before touching on the question of sampling and related legal issues. My main focus in this paper is to comment on aesthetic issues in my own artistic practice and research. My goal is to offer food for thought regarding the current state of contemporary electroacoustic music practice, and by extension give an insight into the motivation behind my own work.</p>

1845 End of symposium