Innovation In Music 2013

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Contents

Welcome to Innovation In Music 2013

About Innovation In Music 2013
4-6 December 2013
hosted by the University of York and York St John University.

Innovation in Music (InMusic'13) is a new European music industry conference bringing together researchers and professionals alike interested in the future of the music industry from the artist through to the consumer.

InMusic'13 we hope will be an outstanding opportunity for all those interested in the fast-moving changes taking place in the music industry to mix with experts in the field, exchange experiences and learn about the latest trends and innovative developments.

As you know participants can also achieve a publication in the gold-standard online proceedings, plus we hope the forthcoming journal.

Conference Organisation

General Conference Chairs
Dr. Jez Wells, *University of York, UK*
Ben Burrows, *York St John University, UK*

KES Executive Chair
Professor Robert J. Howlett, *Bournemouth University & KES International*

Co-Chairs and Innovation In Music Steering Committee
Justin Paterson, *London College of Music, University of West London, UK*
Dr. Rob Toulson, *Anglia Ruskin University, UK*
Dr. Jay Hodgson, *University of Western Ontario, Canada*
Ben Burrows, *York St John University, UK*
Russ Hepworth-Sawyer, *MOTTOsound & York St John University, UK*

International Programme Committee
The International Programme Committee (IPC) members can be see at the website www.innovationinmusic.com. Should you wish to become an IPC member, please let one of the above Steering Committee members know today.

Conference Timetable

Innovation In Music 2013

Wednesday 4th December 2013

Time	Event	Location
18:30	18:30 Registration & Drinks Reception and 19:30 Opening Concert — "IMPRINTS" - Opening Concert in quadraphonic.	York St John University, Temple Hall, Lord Mayor's Walk, York, YO31 7EX

Thursday 5th December 2013

Location: Music Research Centre, Department of Music, University of York, YO10 5DD

Time	Session	Details
08:30	Registration & Networking	
09:00	Conference Opening and Welcome	Welcome talks from hosts, KES International and Conference Chairs
09:05	Keynote Talk	Crispin Murray (Guilde Productions) - "Restoring Audio Quality"
09:50	Special Session	'Tweeting Machines' with Jerry Fleming
10:20	Coffee & Networking	
10:45	Parallel Paper Session 1	
12:00	Lunch	
12:45	Keynote Talk	Thomas Lund (TC Electronic) - "Give Peaks A Chance"
13:30	Industry Special Session	Phil Dudderidge (Focusrite) - "Planned collaborations – when two minds meet and actually agree!"
13:50	Industry Special Session	Dave Hodder (Novation) - "Unplanned collaborations – creating the foundations for unexpected and diverse innovation"
14:20	Special Session	'Theremin Bollards' with David Young
14:45	Coffee & Networking	
15:00	Special Session	Paul Ferguson - "LOLA Rehearsal"
15:30	Special Session	J.A.M.E.S. - Panel on "Music Technology and Knowledge Transfer", chaired by Dr. Rob Toulson
16:10	Parallel Paper Session 2	
17:15	Conference day finishes	
19:30	Conference Dinner	Conference Banquet and Networking — Royal York Hotel (next to York Railway Station)

Parallel Paper Session 1 (10:45)

Paper Session 1A - Technology & Artistic Innovation 1
(chaired by Jez Wells)
• William Campbell - "A Quantitative Evaluation of Signal Masking in Summed and Compressed Audio"
• Dr. Rob Toulson - "Evaluating harmonic and intermodulation distortion of mixed signals processed with dynamic range compression"
• Benjamin Eyes - "Real Time Drum Augmentation with Physical Modelling"
• Dr.Chris Barlow - "Potential for reduction in noise exposure using closed back headphone monitoring for rehearsal - a pilot study"

Paper Session 1B - Composition & Innovation
(chaired by Ben Burrows)
• Darrell Mann - "Automated? Wow? Generation In Musical Composition"
• Dr. Rob Smith - "Interdependable: Case studies on improvised music, composition and contemporary dance"
• Dr Mark Marrington - "Contemporary music technology and creative autonomy: auteurship and the DAW"
• Bruce Darlington - 'Music On The Screen'

Parallel Paper Session 2 (16:10)

Paper Session 2A - Musical Innovation
(chaired by David Young)
• Prof. David Howard - "First applications of the Vocal Tract Organ"
• Thomas Webster - "OWL Stage Effects Pedal"
• Oliver Larkin - "pMix-Touch"

Paper Session 2B - Past, Future & Present
(chaired by Jez Wells)
• Marcus O'Dair - "The Slow Burn"
• Dr. Ainslie Harris - "Monetizing consumer behaviour in a multi-sided music business environment"
• Andra Ivanescu - "The Music of Tomorrow, Yesterday! (Music, Time and Technology in Bioshock Infinite)"

* The conference dinner is for full paying delegates. Should students or accompanying persons wish to attend, an additional fee must be charged.

Innovation In Music 2013

Friday 6th December 2013

KES International		
10:00	Registration & Networking	Music Research Centre, Department of Music, University of York, YO10 5DD
10:15	Special Session	**Jeff Levison**, (IOSONO China) - "Practical Applications Using Wave Field Synthesis In live Performance"
10:45	Special Session	**"TouchKeys"** multi-touch keyboard with Andrew McPherson
11:15	Special Session	**CollabHub** - Fostering enterprise in music technology
12:00	Lunch	
12:45	**Keynote Talk**	Keynote Interview - **Jake Gosling** (Producer), interviewed by Dr. Rob Toulson
	Parallel Paper Session 3	
13:45		**Paper Session 3A - Software & Uses 1** *(chaired by Jez Wells)* •Justin Paterson - "Wavefondler" •Dr. Sander Huiberts - "The Game Pulse - Timing Game Events and Music Events" •Dr. Rob Toulson - "Embedding ISRC Identifiers in Broadcast Wave Audio Files"	**Paper Session 3B - Technology & Artistic Innovation 2** *(chaired by Ben Burrows)* •Dr. Ryan Stables - "Assisted Parameter Modulation in Music Production using Large-Scale Producer-Defined Semantics" •Matt Shelvock - "The Progressive Heavy Metal Guitarist's Signal Chain: Contemporary Digital and Analog Strategies"
14:45	Coffee & Networking	
15:00	**Parallel Paper Session 4**	
		Paper Session 4A - Software & Uses 2 *(chaired by Ben Burrows)* •Dr Kenneth McAlpine - "Sampling the past: A tactile approach to interactive musical instrument exhibits in the heritage sector" •Hali Santamas - "Audio-Photographic Art: An introduction to music and photography as a single art object"	**Paper Session 4B - Technology & Artistic Innovation 3** *(chaired by Jez Wells)* •Mack Enns - "Tearing Apart the Soundscape: Fez and the Conceptualization of Space in Recorded Music" •Tychonas Michailidis - "The Art of Illusion: the magic in performing electronic music"
15:40	Conference Plenary Session	**"INNOVATE"** - cross-disciplinary panel-lead group discussion to which all delegates are invited to contribute... *(Chaired by Justin Paterson)*
16:20	Conference Close	

Keynote and Invited Speakers

Crispin Murray
Guilde Productions

Restoring Audio Quality

Crispin Murray, former Technical Manager at Metropolis Studios and now Director of Guilde Productions will deliver a keynote address knitting together his story on where the industry is going with a focus on the idea that music needs to remain intelligible, pleasant, and high-quality. 'It seems slightly absurd that we have so much more advanced technology now and yet we still struggle to provide the mass market with high-quality audio'.

Thomas Lund
TC Electronic

Give Peaks A Chance

Music production, distribution and consumption has been caught in a vicious spiral rendering two decades of our music heritage damaged. Because of irreversible dynamics processing and data reduction from production onwards, new tracks and remastered ones typically sound worse than what could even be expected from compact cassette.

However, with Apple, WiMP and Spotify now engaged in a competition on quality, and iTunes Radio adopting loudness normalization, limbo-practice is finally losing its grip on distribution.

The presentation uses terms "Integrated Loudness", "Short-term Loudness", "Momentary Loudness", "True-peak Level" and "Peak to Loudness Ratio" to analyze recorded music fidelity over the past 50 years from physiological and engineering angles. In the new realm, it's futile to master music louder than -16 LKFS.

Biography: Thomas Lund started his professional life a musician and recording engineer. After studying medicine and perception at University of Aarhus, Denmark, he joined TC Electronic in 1997. Thomas was among the first to document the sonic consequences of the 'loudness wars' in music production, and has helped international audio standards evolve away from proprietary technology towards the transparent and facts-based solutions of today. He has published 35 technical papers for AES, SMPTE and NAB; and contributed to standardization in Scandinavia, within AES, ITU, EBU and ATSC.

At TC Electronic, he has been responsible for developments on spatialization, localization, format conversion, true-peak detection, NIHL and loudness. He holds a position as CTO Broadcast & Production.

Jake Gosling
Record Producer

Keynote Interview with Dr. Rob Toulson

Jake Gosling is a multi-platinum selling music producer, songwriter, remixer, manager and publisher best known for his work with artists such as Ed Sheeran, Paloma Faith, One Direction and Wiley. Jake was named Music Week's number 1 'Top Producer of 2012' after work on the albums '+', 'Fall to Grace' and One Direction's 'Up All Night'. Gosling has also produced official remixes for Keane, Lady Gaga, Timbaland, Keri Hilson and Far East Movement amongst others under the pseudonym Sketch Iz Dead.

Gosling worked extensively on Sheeran's debut album '+', which debuted at the top of the album charts with first week sales of 102,000 and spawning high charting singles 'The A Team', 'You Need Me, I Don't Need You', 'Lego House' and 'Drunk'. The latter, being adapted by Sheeran and Chris Moyles and produced by Gosling for Moyles' parody album 'The Difficult Second Album'.

By September 2012 '+' had been certified 5x platinum indicating sales of over 1,500,000 records sold in the UK. '+' has also achieved international successes with over 29 gold and platinum awards outside of the UK.

Jake has previously produced tracks on both of One Direction's albums; 'Up All Night' and 'Take Me Home'. This includes the single 'Little Things', which went straight in at number one in the UK charts, giving One Direction both a Number one single and Album simultaneously in the UK.

Phil Dudderidge
Focusrite

Focusrite®

Planned collaborations – when two minds meet and actually agree!

Phil Dudderidge, the CEO of Focusrite will present a talk on collaboration and innovation being key to the focus and success of Focusrite.

Phil is one of most significant figures in the UK audio industry having formed Soundcraft in 1973 and later acquiring Focusrite in 1989 - a company which goes from strength to strength in both reputation and innovation.

Dave Hodder
Research & Development - Novation

novation®

**Unplanned collaborations –
creating the foundations for unexpected and diverse innovation**

Dave Hodder, Research & Development Manager of Novaton will discuss the beauty of unplanned collaborations and how these produce both unexpected product and also unexpected results from using those products.

Special Sessions

"IMPRINTS"

Opening Concert on Wednesday 4th December

Imprints started as an experimental studio project, focusing on live sound manipulation and mass sonic textures within a custom-built surround sound environment. These sessions culminated in an album, Inside Every Second, a 32-channel live recording, capturing a single 50-minute take without any overdubs.

Imprints has since evolved into a fully-fledged band, incorporating an ever-expanding range of influences and musicians, all seeking to explore and expand upon the boundaries of noise, electronic and ambient sound. You can expect to hear sounds that blur the lines between the acoustic and the electronic, with one eye on the past and the other on the future.

Grainy, tape-saturated atmospheres merge with pedal-steel-guitar, circuit-bent machines and synthesisers. Double bass and live acoustic drums underpin the controlled chaos. The band also present live visuals that change and evolve according to the performance, providing an all encompassing aural and visual experience. The new album from IMPRINTS is forthcoming on Serein in 2014

David Young
York St John University

"Theremin Bollards"

Theremin Bollards are a fun interactive sound sculpture that anyone can play.Accessible and innovative experience for music creation - Designed for multiple creative uses, these amazingly inspiring instruments produce a rich tapestry of expressive sounds and will blow your mind...

Designed to be a creative music-making device activated by gestures, Theremin Bollards can be used for performance art, music composition, education, music therapy; commercial advertising and practically any event you want to add something different - such as Innovation in Music!

Jeff Levison
Executive VP, IOSONO China, Shanghai

Practical Applications Using Wave Field Synthesis In live Performance

In October 2013 two live concert events were staged in Shanghai. Modern Kunqu opera performer Zhang Jun performed in the round to an intimate audience as part of the annual Shanghai International Arts Festival and the Shanghai Symphony Orchestra held an outdoor concert of popular classics on the waterfront. Though seemingly unrelated due to their genres, these two events had audio technology in common as they both used Wave Field Synthesis (WFS) to drive the PA and modify their sense of acoustic space elecrtroacoustically. Both used an WFS rendering system feeding a set of conventional speakers.

Zhang Jun performed for an audience of 95 within a 103.4 sound system that included a WFS ring at ear height, a triangulated ceiling array and mid height ring rendering in VBAP. Zhang's voice was strong enough for the small space at the Shanghai Conservatory Of Music and his wireless microphone was used for adding reverberation using a multi-tap convolution engine. Other live soloists joined him in performing within the prerecorded WFS accompaniment.

Two days later, an eighty member Shanghai Symphony Orchestra performed European and Chinese compositions with the Shanghai skyline as its backdrop for an audience of 700 people. By careful microphone placement and a multi-layer approach to building a WFS ring plus speakers suspended over the audience, the power of the orchestra - usually only realized indoors – was recreated in this unconventional venue nested between new highrise buildings.

The acoustic performance of both systems was unique in its ability to overcome imaging difficulties frequently encountered at similar presentations. Jeff Levison will discuss the design goals, system installation details, problems encountered, and the audience reaction.

Jerry Fleming
Sound Artist

"Tweeting Machines"

'Tweeting Machines' is an interactive, robotic rhythm generator. Driven by an easy-to-use syntax, it utilises the flexibility of the Twitter platform to trigger custom designed mechanical percussion. As much an experiment into code-driven music as rhythmical interactivity, 'Tweeting Machines' is a sandpit for exploring the work of mechanical rhythm generation.

Its operating modes will allow for:
- Work for solo Tweet
- Duet for Tweets
- Trio for Tweets and Markov Chain
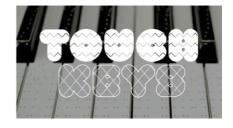
InMusic'13 attendees are invited to view and control 'Tweeting Machines' by sending Twitter messages from their phones, creating an interactive human-computer performance.

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Andrew McPherson
Queen Mary, University of London

TouchKeys Multi-touch Keyboard

The TouchKeys are an augmentation of the piano-style keyboard which add multi-touch sensing to the surface of every key. On traditional keyboards, once a note is played, the performer has limited opportunities to shape its sound before it is released. The pitch and modulation wheels found on many keyboards require an entire hand to play, and aftertouch (key pressure) presents ergonomic challenges. By contrast, the TouchKeys measure the position of the fingers on the key surfaces, allowing the performer to add vibrato, pitch bends and timbre changes to each note independently just by moving the fingers on the keys during performance.

The mappings between touch data and sound have been designed to avoid interference with traditional keyboard technique, so the TouchKeys can build on the expertise of trained pianists with minimal relearning. Additionally, the TouchKeys are designed to work with existing keyboards. Thin sensor overlays attach to each key to measure the finger position while maintaining the familiar action of the keyboard.

In Music is pleased to present a hands-on demonstration in which attendees can play the instrument. The talk will also discuss a recent successful crowd-funding campaign on Kickstarter which raised support for producing and distributing TouchKeys instruments. .

Paul Ferguson
Edinburgh Napier University

LOLA Rehearsal

An open rehearsal will be staged featuring live musicians in York and others in Edinburgh, demonstrating the possibilities of interacting both verbally and crucially, musically whilst physically separated by large distances, yet connected over the internet. Currently, other internet communication systems impose too much delay (latency) for musicians to interact in real time. LOLA technology is groundbreaking by providing lower latency than any other audio-video system developed for this application so far. With bidirectional high-quality audio and video feeds, LOLA is able to reduce the latency down to under 10 milliseconds. Musically, this translates to the delay incurred by the propagation of sound over a distance of about 35 feet, which is equivalent to musicians playing together on either side of a stage.

InMusic '13 attendees will be able to join the York event as observers in order to see how musicians interact, perform and react in this progressive paradigm.

LOLA likely represents a future working method that will be widely embraced, reducing the need for physical rehearsals, revolutionising studio recording and opening up new modes of recital.

The session will be introduced by Dr. Paul Ferguson of Edinburgh Napier University, a leading expert in LOLA who has previously presented on this topic to the Audio Engineering Society (AES) in Rome.

An opportunity for questions and discussion will also be provided.

Liz Dobson
University of Huddersfield

CollabHub - Fostering Enterprise In Music Technology

At the University of Huddersfield Liz Dobson has been exploring extra-curricular approaches to learning in music and music technology, by developing an interdisciplinary collaboration hub. This special session outlines some questions raised through her PhD research on longer-term undergraduate and interdisciplinary collaboration, and the theoretical principles that led to developing this approach. The majority of the session will focus on student perceptions of what this extra-curricular forum offers. Some students were interviewed by their peers and some by Liz, however, there will also be a number of students present to talk about their experiences and answer questions about this approach to fostering enterprise and innovation in music technology. The session will end by identifying salient issues that require closer scrutiny, opening possibilities for further investigations that might help to quantify how extra-curricular activities can begin to foster innovation amongst undergraduates, in and around music technology.

J.A.M.E.S.
(featuring Phil Harding & Melvyn Toms)

Panel on Music Technology and Knowledge Transfer

Dr Rob Toulson will chair a panel including JAMES Chairman and Producer, Phil Harding, Melvyn Toms and some academic partners to discuss the position our universities can plan in aiding innovation in the industry.

Paper Session Titles and Summaries

Paper Session 1A - Technology & Artistic Innovation 1

William Campbell
Anglia Ruskin University

A Quantitative Evaluation of Signal Masking in Summed and Compressed Audio

In music production, it is common practice to apply dynamic-range compression to summed audio signals. Traditionally, the operators attention is drawn to the reduction in dynamic range and the sonic signature imposed by the envelope (settings) of the device, and the resulting distortions are familiar to studio practitioners. However, the non-linear characteristics of compression combined with the interaction of these summed signals are likely to produce less familiar side effects such as intermodulation distortion, manifesting itself as signal masking and other related artefacts. Comparative quantitative analysis of compressed simple and compound signal structures shows the products of this distortion to be realignment of harmonic structure, reduction of spatial and temporal clarity, and rearrangement of dynamic variances related to the rhythmic structure of musical signals. Although the rearrangement of the dynamic variances is expected in that the variances are reduced, what is less expected is the extent to which amplitudes of certain individual components of summed signals are attenuated, effectively precipitating signal masking. This research shows that decreasing the number of signals interacting with each other whilst applying an equivalent amount of compression can reduce the intermodulation distortion and therefore improve the overall signal quality of commercial music.

Dr. Rob Toulson
Anglia Ruskin University

Evaluating harmonic and intermodulation distortion of mixed signals processed with dynamic range compression

Dynamic range compression of simple signals results in harmonic nonlinear distortion. However, for summed signals, predominantly inharmonic intermodulation distortion (IMD) is generated. This research compares the methods of compressing signals prior to and after summation in order to identify approaches to reduce the level of IMD. Results show that lower IMD values are achieved by applying compression prior to summation.

Dr. Chris Barlow
Southampton Solent University

Potential for reduction in noise exposure using closed back headphone monitoring for rehearsal? A pilot study.

Musicians ins popular genres - in particular students musicians tend to rehearse for long periods of time in small, often reverberant rehearsal spaces (Barlow, 2011, Danse et al, 2012), resulting in noise levels which bring significant risk of long term hearing loss, unless appropriate protection is used (Patel, 2008). This study assesses the potential for reduction in noise exposure by monitoring using closed back headphones with a high level of insertion loss. Results indicated no significant decrease in overall exposure levels, with some musicians actually being exposed to significantly higher sound pressure levels, potentially indicating increased risk for live musicians who use in ear monitoring rather than loudspeaker monitoring.

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Ben Eyes
University of York

Real Time Drum Augmentation with Physical Modelling

Research into how drums and percussion instruments can be augmented using physical modelling techniques. Working with percussionist Martin Scheuregger we have created a piece of music that looks at some of the techniques that can be used to extend the sound of a percussion kit using string models.

Paper Session 1B - Composition & Innovation

Darrell Mann
Systematic Innovation Limited

Automated 'Wow' Generation In Musical Composition

The paper reports research to identify and then reverse engineer what evokes a 'wow' emotional response in listeners of musical compositions. The results of this analysis have then been compared to a systematic innovation methodology built on the analysis of close to three million innovations observed from a wide spectrum of human endeavour in order to identify similarities and differences. The result of this analysis is the fact that all of the examined musical 'wows' could be seen to fit precisely into a very small number of established patterns of inventive thinking. A final section of the paper discusses the possibility that these inventive patterns can be built into software-based composition tools in such a way that new 'wow' moments can be generated in an at least partially automated fashion.

Dr. Rob Smith
University of South Wales

Interdependable: Case studies on improvised music, composition and contemporary dance.

Reflections on compositional practice are presented through case studies into two recent contemporary dance performances. The musical scores were created using improvised material created whilst working in situ with the choreographer and dancers, enabling a creative feedback loop to occur whereby the evolution of dance and music become mutually interdependable. This paper is a report on this process, the strengths and weaknesses we have discovered in it, and an attempt to convey where we think the work might lead us.

Dr. Mark Marrington
University of Leeds

Contemporary music technology and creative autonomy: auteurship and the DAW

Auteurship in musical creativity has always been bound up with the employment of one technological medium or another. In much of twentieth century popular music, for example, the prime vehicle for the singer-songwriter was the guitar, by turns the Fascist-killing 'machine' of Woody Guthrie and the sonic paintbrush of Jimi Hendrix. Likewise the increasingly affordable samplers, synthesizers and drum machines of the 1980s facilitated the most ground-breaking artistic statements of that era (imagine Hip Hop without the MPC or the Roland beatbox). Elsewhere it has been the studio itself that has provided the vehicle for 'uniqueness' (think Wilson or Eno), although the unfettered use of this medium was for a long time hindered by inaccessibility

and a lack of specialist knowledge. Today, with the ability to digitally simulate all the above 'in the box', it is the laptop that is truly empowering the musician. My proposed contribution explores from various perspectives the impact of the Digital Audio Workstation (DAW) upon individual musical creativity. In particular I consider the role such technologies have had in enabling a wide range of musical 'literacies' to flourish, some of which are unique to the DAW environment itself (i.e. they are new). The subject matter will be partly informed by the recent research I have undertaken as an academic teaching DAW-based music creation and production in HE institutions. While it is apparent that the DAW has initiated a revolution in terms of accessibility to tools, my concern is also to highlight the fact that the medium constructs the user as much as it facilitates his/her creativity. Thus a key question I wish to pose concerns the user's ability to discern, in the interests of the autonomous creative vision, the often imperceptible working of the medium on his/her thought process.

Æs International

Paper Session 2A - Musical Innovation

Professor David Howard
University of York

First applications of the Vocal Tract Organ

This paper describes an innovative musical instrument that has arisen out of research into the acoustics of singing to fulfil a performance need. It offers the potential for a novel approach to both performance and composition as it brings together the pipe organ and human voice production as a Vocal Tract Organ.

Thomas Webster
OWL

The OWL Stage Effects Pedal

Paper presenting the OWL stage effects pedal - an open source, programmable dedicated audio device that can be programmed in C++ and used on stage without a computer.

Oliver Larkin
University of York

pMix-touch

pMix-touch is an extension of the author's pMix software[1], which is a composition, sound design and performance tool based on multi-layered preset interpolation, that was originally created as a MaxMSP library (int.lib) and presented in[2]. pMix facilitates the control of VST plug-in parameters from a rich 2D graphical interface that has been designed to provide intuitive feedback and to allow the control of multiple parts of a signal processing graph from one abstract 'interpolation' space (hence multi-layered preset interpolation). The software comes with a collection of sound generation and processing plug-ins that have been specially developed with parameter interpolation in mind. The plug-ins cover a range of experimental DSP techniques used in computer music (noise generators, resonators, FM synthesis, formant filtering, frequency shifting). While the main pMix application runs on a computer, pMix-touch uses an embedded web server to expose this interface to a wide variety of client devices including tablets, smart phones or other computers. The interface is rendered using client side JavaScript and the HTML5 canvas[4], which makes it highly portable and allows it to benefit from speed increases that come as result of the 'browser wars'. Touch events provide new ways to interact with the preset interpolator by designing, navigating and controlling interpolation spaces using multi-touch gestures. The presentation will introduce pMix-touch and discuss the design decisions, potential benefits and practical issues of browser-based interfaces for remote-controlling audio software.

Bruce Darlington
University of Chester

Music On The Screen

This paper engages in a reconsideration of music engagement through a technological discourse centered around the screen. It employs various theoretical positions adopted from contemporary academic authors' writing around music and technology and shifts focus to allow a new understanding of music engagement to privilege the body as the central site of epistemological creation.

Paper Session 2B - Past, Future & Present

Marcus O'Dair
Middlesex University

The Slow Burn

This paper celebrates the slow burn as opposed to the overnight success, drawing on writers including Chris Anderson, Malcolm Gladwell, Seth Godin and Eric Ries as well as the author's experiences in the acts Passenger and Grasscut.

Dr. Ainslie Harris

Monetizing consumer behaviour in a multi-sided music business environment

The business end of today's music industry is no longer dictated by a linear supply chain or a value chain, but a complex, multi-sided network environment, with stakeholders that include artists, consumers, channel marketers, advertisers, and rights holders, among others. Music is no longer a separate product in itself. Songs and albums have become commoditized, and music is now simply a means to an end. Today, it can be legitimately argued that it is consumer behaviour, delivery channels, and the experience of music rather than the tracks themselves that are monetized; this has led to the introduction of new business models, such as ad-supported music streaming and download services, in order to take advantage of the changing nature of music consumption. In this multi-sided business network, no single stakeholder has control over the monetization of music, though some stakeholders exert more influence than others. The stakeholder network is inter-dependent; though consumers hold ultimate power and freedom in the network, they alone cannot singlehandedly influence its success or failure. Thus, as power shifts from the product supplier to the consumer, the nature of the procurement/consumption experience (e.g. quality, utility, ease of engagement) plays an increasingly important role. At present, there is scant representation of these concepts in the literature. As such, this paper presents the results of a recent study [1] that investigated the characteristics that consumers evaluate in their choice to use ad-supported music services, the factors that influence consumer attitudes towards such services, and the influence consumers and other stakeholders exert in a multi-sided network environment. 1. *Harris, A. J., (2013). A model of key characteristics affecting consumer attitudes toward the usage of free legitimate ad-supported music download services. DBA Thesis. Robert Gordon University: UK*

Andra Ivanescu
Anglia Ruskin University

The Music of Tomorrow, Yesterday! (Music, Time and Technology in Bioshock Infinite)

Together with other games like Journey, Grand Theft Auto and Fallout, the Bioshock series and Bioshock Infinite in particular pave the way for the video game music of tomorrow.

Paper Session 3A - Software & Uses 1

Justin Paterson
London College of Music, University of West London

Wavefondler

It has long been a dream of those involved in audio manipulation to interact directly with a visualization of the target audio. In recent times, the mouse has been giving way to multi-touch interfaces, allowing a more tactile, immediate and intuitive interaction with the audio, and importantly offering more than one point of parametric contact. New modes of manipulation and performance are increasingly possible through a number of systems.

This paper will document the trajectory of recent developments in such multi-touch applications, and investigate workflow and its implications via a number of case studies.

Further, using a hybrid of emergent software platforms, it will demonstrate a custom interface design that allows the operator to access a visualization of an audio waveform on one or more iPads, and using multi-touch gestural control applied to the waveform, manipulate the sound via processing on a host computer.

Dr. Sander Huiberts
HKU University of the Arts Utrecht

The Game Pulse - Timing Game Events and Music Events

The aim of this paper is to examine how to design nonlinear music systems that allow for music events to coincide and correspond with dynamically changing game events. We address the challenges of connecting nonlinear music systems to gameplay and distinguish three approaches to time music events and game events: Trail, Sync and Lead. We explore these three approaches in a design case study Gluddle, a game created by the authors. Our preliminary findings illustrate the benefits of combining Trail, Sync and Lead, positively influencing game experience, but also the need for extra attention to gameplay balance and technical implementation.

Dr. Rob Toulson
Anglia Ruskin University

Embedding ISRC Identifiers in Broadcast Wave Audio Files

A recent initiative by the UK Music Producers Guild and the European Broadcasting Union is to utilize the Broadcast Wave (BWF) file format for commercial music releases, allowing the International Standard Recording Code (ISRC) to be embedded within the file. At present, unlike with compact disc releases, it is not possible to embed the ISRC in a standard Wave or data compressed file. This paper gives a discussion of the opportunities brought by embedding the ISRC in digital audio files. Examples of BWF metadata are shown along with a discussion of the correct use of ISRCs in music production and audio mastering, as well as a look at relevant requirements of emerging music sales and delivery formats.

Paper Session 3B - Technology & Artistic Innovation 2

Dr. Ryan Stables
Anglia Ruskin University

Assisted Parameter Modulation in Music Production using Large-Scale Producer-Defined Semantics

In music production, audio effects and synthesis parameters often address technical low-level processes, which can be difficult to interpret and use without experience and extensive training. In order to make the process more accessible, we therefore investigate methods of creating high-level parameters, thus bridging the gap between musicians and technology. In this study we develop semantic parameters for audio effects by gathering large amounts of musical semantics data from music-producers at the point of content creation. By extracting the parameter state of an audio plug-in and a series of audio features, we can then use the data to non-linearly modulate parameters within the same interface.

Matthew Shelvock
University of Western Ontario

The Progressive Heavy Metal Guitarist's Signal Chain: Contemporary Digital and Analog Strategies

This paper seeks to elucidate signal processing as musical communication. To do this, I start by establishing an analytically meaningful aesthetic distinction between the musical products of signal processing techniques employed by Djent/Progressive Heavy Metal guitarists and techniques employed by guitarists working in other heavy metal sub-genres. I focus, in particular, on crucial differences in the mid-range of guitar tones characteristic of certain metal sub-genres, common practice gain staging procedures, noise management techniques, and approaches to compression. I explain how these technical procedures are, in fact, musically meaningful. In so doing, I further an emerging research paradigm which sees recording practice as musical practice per se, rather than simply a "technical support" for the "true arts" of composition and performance (see Hodgson 2010).

Paper Session 4A - Software & Uses 2

Dr Kenneth McAlpine
University of Abertay Dundee

Sampling the past: A tactile approach to interactive musical instrument exhibits in the heritage sector

In the last few decades, the heritage sector has undergone a periodic shift in its approach to visitor engagement, moving from very detailed, didactic displays of collections to a more experiential, even interactive, mode of engagement, with some museums embracing wholeheartedly the concept, and using immersive spaces and actors to provide visitors with an 'authentic' sense of culture, environment and period. Collections of musical instruments have been slower to adopt these ideas, and for good reason. Curators and conservators must balance access to fragile historic instruments with their duty of care to ensure their preservation for future generations: let a few cohorts of eager schoolchildren loose on a working 16th Century Spinet, and the collection may not have a working 16th Century Spinet for very long. Nevertheless, there is a clear and identifiable desire to engage with music collections in this way, and a sound museological rationale for providing such access. After all, if we present a musical instrument behind a red velvet cord, or inside a class case, we strip it of its function, its very reason for being. It ceases any more to be a musical instrument and becomes a beautifully ornate, but ultimately impractical piece of furniture. Of course, guided listening tours and special concerts do give the public the opportunity to hear the instruments being played, but this still falls short of actually playing a keyboard, and directly experiencing the link between the form and the function of the instrument. But music technology can provide a solution to this 'red velvet cord' problem. Since the key curatorial concern is focused on preserving the fragile mechanics of the instruments, and since the primary interest by the visiting public is in the sound, any technology which effectively separates and recreates the sound of the instrument from its mechanics would enable the original instruments to be accurately modelled and rehoused in cheap, robust digital electronics, making it a realistic possibility for anyone who wishes to play the originals to do so, albeit in a digital form. This paper, then, charts the development of one such collaborative project with the National Trust. Based at Fenton House in Hampstead, and running since 2008, the project seeks to model all of the keyboard instruments in the Benton Fletcher Collection and provide a dedicated interactive exhibit, which allows visitors to the collection to view all of the instruments in situ, and then play them through a custom-built two-manual MIDI controller with touch-screen interface. We discuss the approach to modelling, which uses high-definition multilayered sampling, and highlight some of the particular challenges presented by the project. We continue by assessing the strengths and weaknesses of the exhibit as it currently stands, and in particular focus on its key shortcoming: at present, there is no way to effectively model the key feel of a historic keyboard instrument. This issue is of profound importance, since the feel of any instrument is fundamental to its character, and shapes the way performers relate to it. The issue is further compounded if we are to consider a single dedicated keyboard as being the primary mode of interface for several instrument models of different classes, each with its own characteristic feel. We conclude by proposing an outline solution to this problem, detailing early work on a real-time adaptive haptic keyboard interface that changes its action in response to sampled resistance curves, measured on a key-by-key basis from the original instruments.

Hali Santamas
University of Huddersfield

Audio-Photographic Art: An introduction to music and photography as a single art object

As a sound artist my work is concerned with the emotive interaction between photography and sound. In contemporary society we are conditioned to read music and image in a particular way, be it through album sleeves, promotional materials or multimedia art. I believe that the

photography and images accompanying certain music releases is inseparable from the music itself: that one medium triggers an internal rendering of the other. These renderings result not just in surface associations, but a deeper connection based on memory and emotion. In my creative work I take advantage of this by presenting music and photography together with equal emphasis on both parts. Its innovation lies in progressing from music with photography to what I'll refer to as audio-photographic art: music and photography as a single art object. Drawing on the writing of Barthes, Deleuze and Ricoeur and using examples from my own work, this paper will demonstrate how my audio-photographic art developed from an interest in the photography based musical improvisations of Nine Inch Nails on Ghosts I-IV (2007) into a new immersive interdisciplinary art form with its own phenomenology and aesthetics.

Paper Session 4B - Technology & Artistic Innovation 3

Mack Enns
University of Western Ontario

Tearing Apart the Soundscape: Fez and the Conceptualization of Space in Recorded Music

This paper proposes and examines the issues involved with the concept of space in the production of recorded music. The soundtrack to the 2012 video game Fez is analyzed through the lenses of Hodgson's ontology of recorded musical communications, as well as Harvey's theories on space in postmodernism. This analysis will reveal the problematic nature of how we conceptualize space, and particularly dimensionality in recorded music, as Fez takes up the dichotomy of 2- and 3-dimensional space as one of its themes.

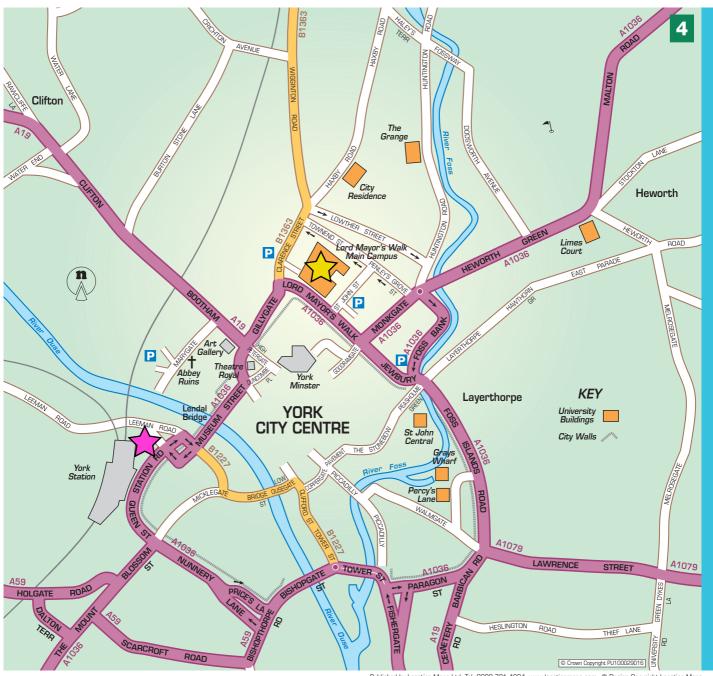## Tychonas Michailidis
University of Huddersfield

The Art of Illusion: the magic in performing electronic music

Performing electronic music is like putting up a magic show. Being a performer it is necessary to have a combination of skills and knowledge that range from programming, acoustics, sound engineering and above all the ability to perform. However, for the general audience the only skill that matters when on stage is how such performances come across. Audiences have no interest in how complicated the system is or how complex the patch is. The audience is looking to experience some sort of sound magic in performing electronic music. In this paper-presentation, I am going to examine different performing approaches of electronic music in an attempt to elaborate on how an illusive approach takes place. Through my composition Live Mechanics, I will argue the need to reconsider the way in which electronic music come across and utilised in front of the audience. Performers, are an integral part of the creative process and they should be carefully examined in regards to their ability to deliver the composition. It is no longer the case of unfamiliar sounds that audiences must be educated but rather the performers' ability to retain the magic in performing with technology

Getting to the Opening Drinks Reception at York St John University

York St John University is a ten minute walk from the train station and going various routes will permit you the opportunity to see York city centre's charm and history. A City Centre map showing the railway station to the bottom left and York St John University in the centre shown below.

York St John University, Lord Mayor's Walk, York YO31 7EX T: 01904 624624
www.yorksj.ac.uk

Getting to the Main Conference

KES International can arrange transport from the IBIS hotel near the railway station to the University of York's Heslington campus upon request (please email laurajones@knowalliance.org).

The Address for the venue for Thursday and Friday is:
The Music Research Centre
Department of Music
University of York
YO10 5DD

By Bus
For those wishing to make their own way to Heslington Campus. A number of companies operate buses to the University of York with the Unibus number 44 or First York number 4 service connecting the University of York with the City Centre, the Railway Station. The scheduled journey time from the railway station to Heslington is less than 20 minutes. Other services are the 27, 28 and 29. The main bus station is at Rougier Street. Both services cost around £2.00 return. There is also a frequent free bus shuttle service on the campus between Heslington West and Heslington East.

Buses run very frequently from York Train Station (adjacent to the Royal York Hotel) to University of York. The website - http://www.york.ac.uk/about/maps/ -has a number of maps are available to help you find your way: a map showing how to get from the city of York to the University of York's Heslington campus. Place in your hotel postcode to the From field and the to field needs to be YO10 5DD - a map of the conference venue can be seen on Google Maps.
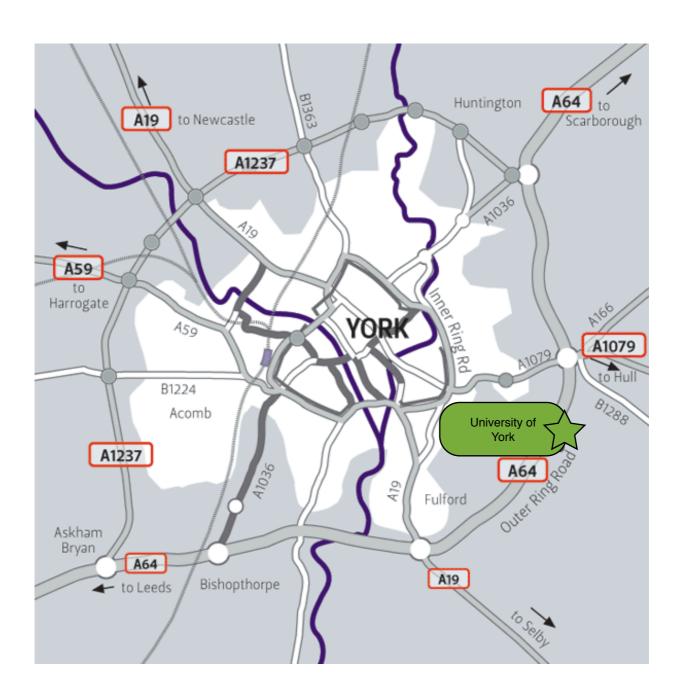
Getting a Taxi
A journey by taxi from York Railway Station to the University takes from 15 to 20 minutes with a cost of around £7.00-8.00.

By Car
The easiest route to the University is to take the outer ring road (A64 on the south and east sides of the city, A1237 round the north and west) to the junction with the Hull/Bridlington roads (A1079/A166). From this junction the route to the University is signposted.

If you are using a satellite navigation system the University postcode is YO10 5DD.

Parking on campus is at a premium and visitor parking is on a pay and display basis (£1.00 per hour, Monday-Friday 8.00am-6.00pm). Please be sure to use designated visitor parking as the regulations are strictly enforced. There are some bays for disabled parking in all University car parks, which can be used by visitors displaying valid disabled parking permits. Please see the university pay and display webpages for more information. For more details please consult the University website.

Getting to the Conference Dinner

The KES Conference Dinner is for Full Paying Delegates only or those who have paid the additional fee to do so if not a full paying delegate. This will be hosted at the Royal York Hotel in the centre of the city and right adjacent to York Railway Station. The address is

The Royal York Hotel,
Station Rd,
York,
YO24 1AA

About KES International.

KES International provides opportunities for researchers, managers and students in high-tech subject areas to connect with others and communicate the results of their research to a wide audience. KES encompasses a five-thousand strong community that participates in its activities.

For over a decade KES has provided a leading annual conference on intelligent systems. It now includes in its portfolio events on sustainable technology, innovation

and knowledge transfer, digital media,

as well as a multiconference on 'Smart Digital Futures'. Conferences take place throughout the world and are attended by an international audience.

KES also publishes several journals and book series in association with leading international publishing houses, and may occasionally run other events and activities of interest to members. Additionally, we are developing innovative methods of web-based presentation and publication to give research outcomes optimum visibility and impact.

KES is an independent association, operated on a non-profit-orientated basis, from a base in the UK. A number of universities around the world contribute to the organisation, operation and academic activities of the association.

As well as organising its own activities, KES can help you to run conferences or administer your membership organisation. Do come and speak with one of us at the conference to find out what KES can do for you.

Involving a membership drawn from a range of universities and companies world-wide, KES is in an excellent position to facilitate international research co-operation and knowledge exchange.

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