

Andrew McPherson

Electronically Augmented Instruments for Creative Expression

Date >

26.04.2017 – 28.04.2017

Location >

MUTProbe1, MUT207,
MUT215

Hochschule für Musik
Am Schloss Gottesau 7
76131 Karlsruhe

Andrew McPherson is Associate Professor in the [Centre for Digital Music](#) at Queen Mary University of London. With a background in electrical engineering and music, his research focuses on augmented acoustic instruments, new performance interfaces, and study of performer-instrument interaction. He did his undergraduate and masters work at MIT, completing his M.Eng. in Barry Vercoe's group at the MIT Media Lab. He completed his PhD in music composition in 2009 at the University of Pennsylvania and spent two years as a post-doctoral researcher in the Music Entertainment Technology Laboratory at Drexel University.

At QMUL, he leads the Augmented Instruments Lab, a research team within the Centre for Digital Music. He is the creator of the magnetic resonator piano, which has been used in pieces by over a dozen composers, including a collaboration with the London Chamber Orchestra. His **TouchKeys** multi-touch keyboard and **Bela**, an open-source embedded platform for ultra-low-latency audio and sensor processing were featured in successful Kickstarter campaigns. <http://www.eecs.qmul.ac.uk/~andrewm>

Distinguished Talk – MUTProbe 1: 26.04.2017, 15:30-16:30

Augmenting Musical Instruments: A Player-Centred Approach

Computing has transformed the production, distribution and consumption of music, and many excellent digital musical instruments have been created. At the same time, traditional acoustic instruments remain ubiquitous in many styles of music.

This talk will discuss augmented instruments, which are traditional instruments whose capabilities have been extended with technology. The talk explores instrument augmentation not just as a technical challenge, but as an approach to extending the virtuosity of trained performers.

I will present two examples of augmented keyboard instruments: the [Magnetic Resonator Piano](#), which uses electromagnets inside an acoustic grand piano to induce vibrations in the strings, allowing the player to continuously shape each note; and [TouchKeys](#), a keyboard integrating multi-touch sensing onto the surface of each key, enabling the player to add vibrato, pitch bends, timbre changes and other techniques by moving the fingers on the key surfaces. The talk will conclude with a set of design suggestions for augmentation techniques which extend and repurpose the experience of trained performers. The talk will be followed by an interactive demo.

Interactive Demo / Improvisation – MUT 207, 16:30-17:00

Workshop I – MUT215: 27.04.2017, 10:30-12.00 + 13:30-16:00

BELA: An Open-Source Ultra-low-latency Embedded Platform

This workshop will introduce Bela, an open-source embedded platform for audio and sensor processing. Bela features include ultra-low (< 1ms) latency from action to sound, analog and digital I/O sampled automatically at audio rates, a convenient browser-based IDE including an in-browser oscilloscope, and support for programming in C/C++, Pd and SuperCollider. The workshop will focus on developing Bela projects in Pd, featuring a number of examples and time for free exploration at the end. <https://shop.bela.io>

Workshop II – MUT207: 28.04.2017, 14:00-16.00

TOUCHKEYS: Multitouch Sensing for Augmented Keyboard Instruments

This workshop will focus on performance and improvisation using [TouchKeys](#), a multi-touch sensor kit which installs on the surface of the piano keyboard to measure the location of the player's fingers. TouchKeys can be used to intuitive add vibrato, pitch bends, timbre changes and other techniques just by moving the fingers on the key surfaces. The workshop will explore TouchKeys on a Disklavier acoustic grand piano featuring the [Magnetic Resonator Piano](#), a set of electromagnetic actuators which induce vibrations in the strings independently of the hammers. <http://www.eecs.qmul.ac.uk/~andrewm/mrp.html>, <http://touchkeys.co.uk>

NB: Talks and Workshops will be held in English.

[Workshop participation is limited. Email registration required:](#)

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