The Digital Performance Laboratory was set-up in 2009 with support of the Anglia Ruskin University Department of Music and Performing Arts and the research institutes *Cultures of the Digital Economy* (CoDE) and the *Anglia Research Centre into Digital Culture* (ArcDigital). The aim of the laboratory is to explore both practically and theoretically, the nature of performance using digital information and methods. This can include HCI, as in the following projects, as well as algorithmic techniques and those of representation and mapping.

Gaggle

The *Gaggle* prototype on show has been imagined and developed in order to experiment personally with such interfaces, and primarily with the link between sensor (in this case 'pings'), arduino board and SuperCollider audio language.

The Open House Festival, amongst other activities, provides an opportunity to investigate performance using Gaggle, including questions such as:

- Does the number of sensors affect the nature of the interface? Does increasing the number of actuators to a point where they are difficult to control consciously affect performativity?

- Does the relative position of the sensors affect the result. In particular these ultrasound sensors can interfere with each other, especially when designing for movement such as that created by dancers.

- How does the *type* of movement to be used with the interface affect the use and design of the interface? *For instance, in this case, how is the direction of the sensors affected and what difference does this make?*

- Interplay between physical implementation and software algorithms: *for instance, does the physical nature of the interface need to be reflected in its performance results.* Of course all the usual issues concerning algorithmic composition and structuring arise at this point.
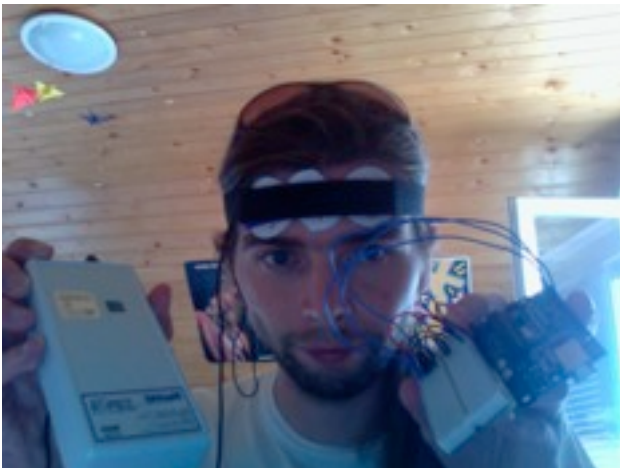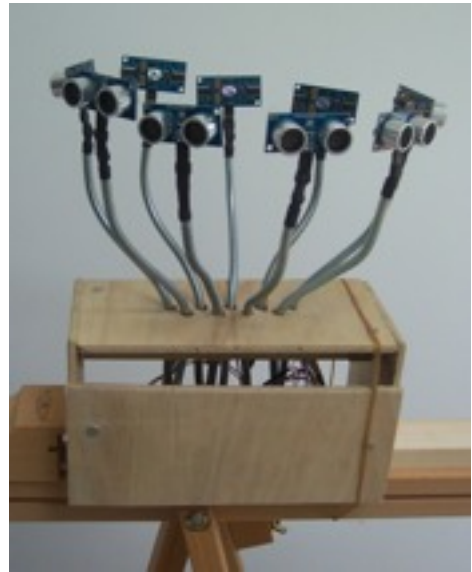
Brain Computer Interface

Measuring EEG (brain data) is complex and using this data to have control over some objects is difficult. In the demonstration today we are using the concept of neurofeedback training to alter "sound environments" and 3D objects (servos). High frequencies (beta waves) of the brain can be decreased through relaxation of the mind. If the desired state of mind is generated for a certain amount of time (use of thresholds), the system rewards the monitored person with additional sounds (or alternatively fades from complex rhythm to silence).

Manta

The Snyderphonics *Manta* is a touch-sensitive controller surface with programmable LED feedback first released in 2009. Designed for use with video and audio, the device displays a hexagonal key layout often associated with non-standard musical scale mappings. The Digital Performance Lab is using the Manta in interaction with purpose-written open-source SuperCollider software for a number of projects. For HCI2009, demonstrations and performance include mapping the physical location of the keys on the interface with the position of musical sound sources in a multi-channel audio environment, as well as utilising the touch sensitive nature of the Manta's keys to map to the volume of individual elements of sounding audio (velocity -> amplitude). These means enable, for instance, the tracking of the position and expressive aspects of the performance of dancers to sounding events triggered via the controller device.

Biographies

Richard Hoadley is a composer with performances, recordings and broadcasts by the BBC Symphony Orchestra and, the BBC Singers amongst many others. In recent years he has focussed on the investigation of the use of technology and the effect of the 'interface' - whether notated 'score', computer programme, keyboard, console, image, set of sensors etc. - on the creative process itself. Compositions and software include *The Copenhagen Interpretation*, (pSY custom programme), *Hello* (MaxMSP) and *One Hundred and Twenty-seven Haiku* (SuperCollider).
rhoadley.org

Tom Hall is active as a composer and performer of electro-acoustic music, with an interest in generative, collaborative and improvisatory processes. He is a developer of the music software SuperCollider, and has published articles on the music of Morton Feldman and Graham Hair. A member of the ensembles [rout] and butterflyCut, Tom's music has been performed throughout Europe and Australia. Tom holds a DPhil in composition from the University of Sussex, and is currently a Senior Lecturer in Creative Music Technology at Anglia Ruskin University.
ludions.com

Krisztián Hofstädter is Hungarian born, moved to England in 2005. He has just completed his studies in Creative Music Technology (BA Hons) at the Anglia Ruskin University, Cambridge and is starting his MA in September. The latest developments in his work include Brain Computer Interfaces, which use the IBVA EEG device, Max/MSP and the Arduino.
tedor.info

Links

Anglia Ruskin University - *anglia.ac.uk*
Anglia Ruskin University Department of Music and Performing Arts - *anglia.ac.uk/mpa*
CoDE - Cultures of the Digital Economy
ArcDigital - *anglia.ac.uk/ruskin/en/home/microsites/arc.html*

Gaggle: Richard Hoadley, *rhoadley.org/gaggle*
Brain Computer Interface: Krisztian Hofstadter, *tedor.info*
Manta Software: Tom Hall, *ludions.com/code*
Manta: *snyderphonics.com*