Sculpture as music interface

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"If the OHMI challenge is to be met, entrants will have to find ways to input the mystifyingly exquisite variation that can match the instruments on which music has been made for centuries."

The One-Handed Musical Instrument Trust
http://www.ohmi.org.uk/

http://www.ohmi.org.uk/the-rules.html

This paper is based on work with dancers and interfaces, linking embodiment through physical computing with the flexibility and power of the SuperCollider audio environment to create algorithmic control of lower (sound), intermediate (phrase), and higher (global) level musical structures in order to reflect the roles of composer and performer.

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The key thing about 'sculpture' as interface is that it's not just the interface, but the potential for **shared**, multiple use that matters. How can these resources then be utilised to create music that is multi-facetted, interesting and flexible.

Two short examples featuring the Gaggle (noting in particular gestural movements)...

HCI 2009

MIST 2010

These interfaces use a variety of forms of common sensors: capacitative touch, ultrasound, force sensing resistance, etc.

They are implemented using off-the-shelf and custom technologies including conductive paints and capacitative triggers.

Custom controllers allow for more flexibility (but no number and variety of sensors can make up for dull algorithms)

The physical form and construction of the interface is crucial as...

...an indication of how interactions might occur (both metaphorical and magical behaviours)

...a separate, independent aesthetic experience

...a prompt for artists, sculptors and musicians to explore their relationships with the devices

...a way of encouraging and enabling activity with complex musics (musicians and non-musicians)

I've explored this most explicitly with a new device called the Metapiano (thanks to Paul Kellett and Dan Stowell).
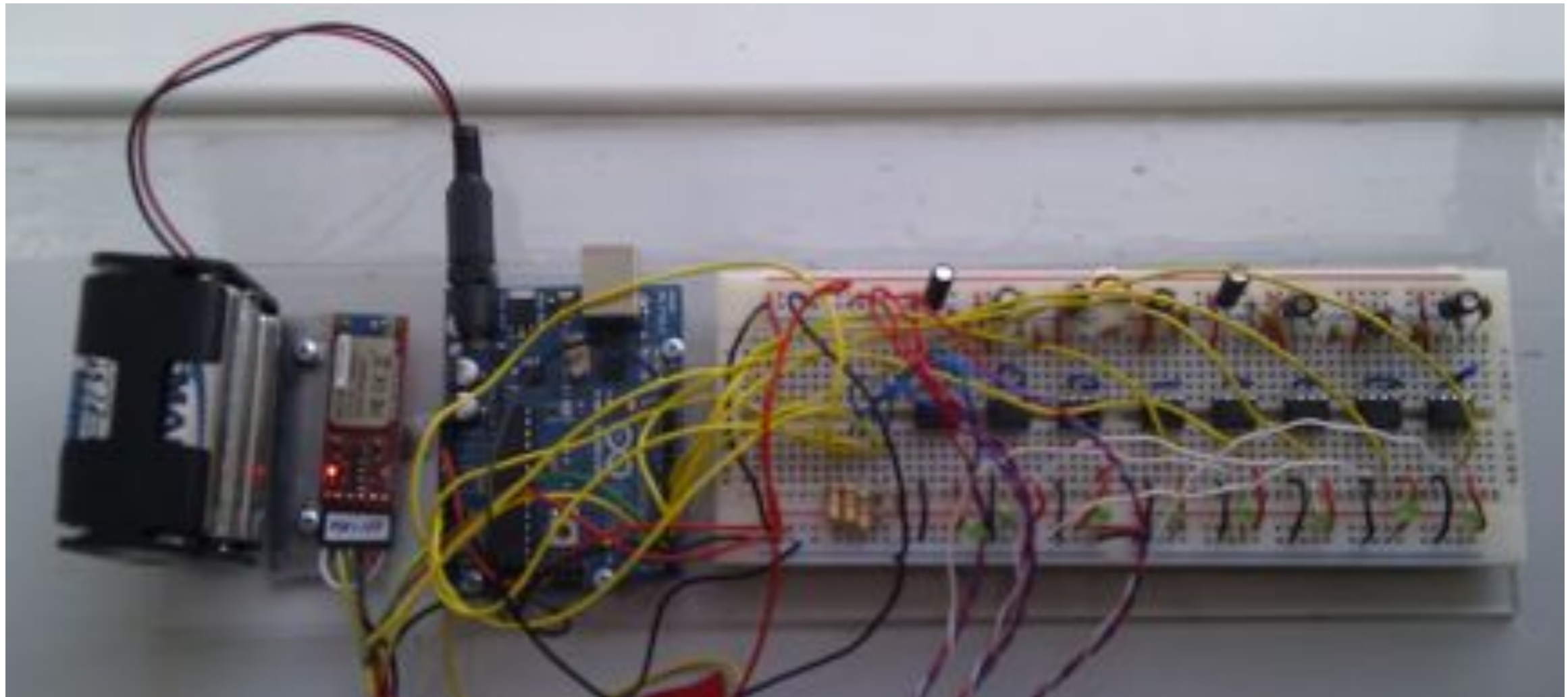
A version of this was used in a recent performance of 'Triggered' in June 2011 at Kings Place in London:

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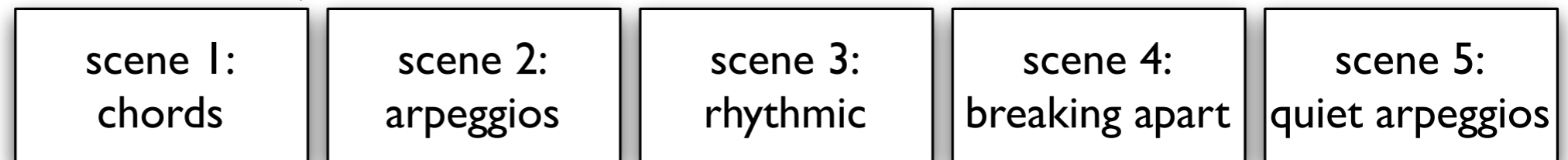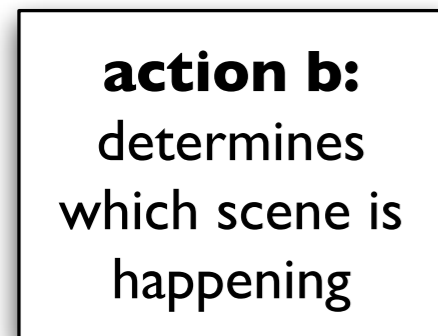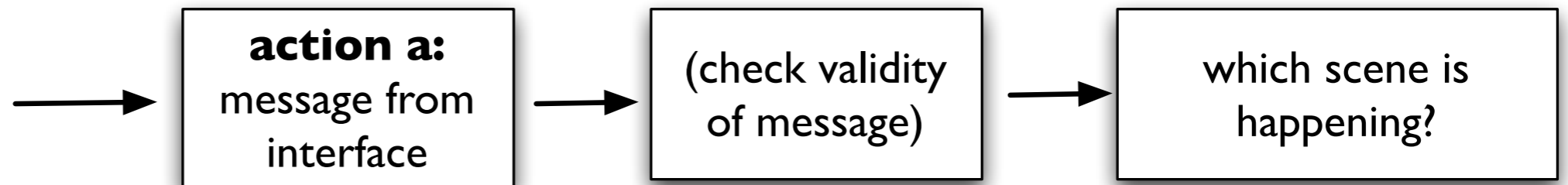richard.hoadley@anglia.ac.uk • http://rhoadley.net/presentations

Demo

- voltage signal to microprocessor.

- converted and sent to SC

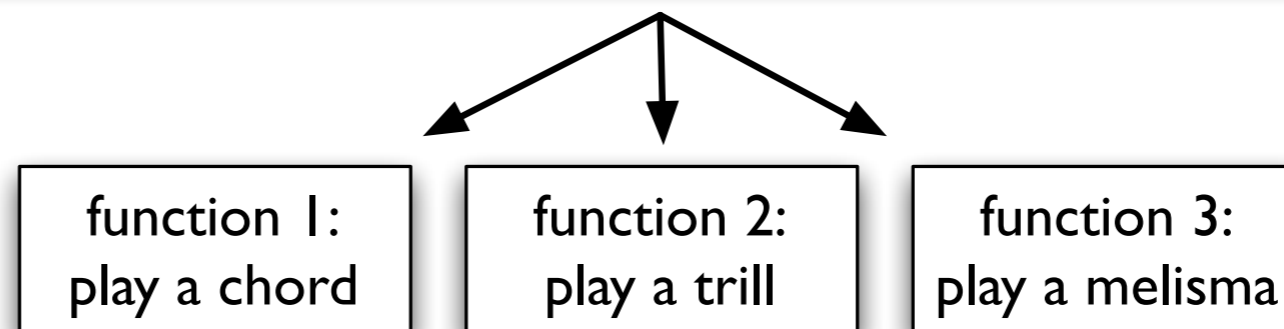- depending on circumstances (see below), trigger and/or modify an algorithm

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A specific example: **a** does what to **b** and when and what happens to **c** as a result?

Top Level

action a:
message from interface → (check validity of message) → which scene is happening?

action b:
determines which scene is happening

| scene 1: chords | scene 2: arpeggios | scene 3: rhythmic | scene 4: breaking apart | scene 5: quiet arpeggios |

Middle Level

which function should be used according to the current circumstances?

| function 1: play a chord | function 2: play a trill | function 3: play a melisma |

Low Level

generate musical events in accordance with information received from above
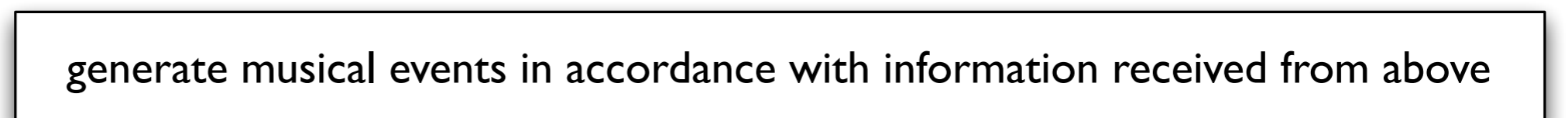
Issues, questions and further work

1. Collaboration, trust, structure and shared agency

- I had initially intended that the dancers could 'improvise' using the sculpture, but this would have involved a lot of 'letting go' on my part. Where can a balance be drawn between strongly narrated, dialectical forms (common in western art music) and 'improvisation'?

- I need to develop **trust** for performers and **confidence** in the technology to fight the temptation to **cheat**.

- Is it possible make an extended (non-ambient) composition easily accessible without many controls (and/or expertise)?

- Designs probably *should* be a collaborative process between sculptors, designers, dancers and choreographers (and clients and therapists): what should we make, what should we touch, what should happen when we touch/stroke/move/squeeze **x** in situation **y**.

NB this involves more than one dimension of interaction, quite possibly shared: how does person **e** doing **this** effect person **f** doing **that**?

- This sort of collaboration can be difficult to achieve and goes against the traditional role of the western art composer: singular, unique and omnipotent.

- This has resulted in a half-improvised, half-generative work. Is it **cheating**? How does it compare to 'standard' music performance?

2. Materials and practicalities

- The intimate investigation of **materials** and their **properties** can be both frustrating and rewarding, for instance, (conductive) paint and invisible heatshrink. This also applies to the practical challenges (how do you hang a unit from a lighting rig?).

- There needs to be more **integration** of **physical units** with **sensors**. In the case of the metapiano, isolating sources of conduction and in doing so alleviating the need for extra wires. Also integrating **force sensing** with metallic sculpture discretely

- **Precision** study of how **detailed interactions** happen seems to be a good analogue for the understanding gained through the **practice** of 'traditional' **instruments**.

- At least for dancers, there's not enough **freedom of movement** here. Using the Gaggle, movement can be free, easy and vigorous. The metapiano is fiddly and looks (and is) delicate. A second unit in preparation is designed to be used primarily by the feet which would have allowed for more vigorous movement, but as it is the metapiano allows for only rather delicate, introspective gestures (too much, or not enough, like some traditional instruments?)

3. Therapeutic applications

- **Touching Sound**: the use of these technologies in music therapy, most especially the use of mediated, shared responses which is a crucial factor in the client/therapist relations

Triggered 2011

Thank you

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