



# The Development of Music Interfaces Through Improvised Dance Movement

---

**Richard Hoadley**

Digital Performance Laboratory  
Anglia Ruskin University  
Cambridge UK

**[rheadley.org/gaggle](http://rheadley.org/gaggle)**

**[richard.hoadley@anglia.ac.uk](mailto:richard.hoadley@anglia.ac.uk)**



# The Development of Music Interfaces Through Improvised Dance Movement

---

- Prototype automatic composer and HCI - hardware and software
- A series of developments in collaboration with performers, dancers and artists (sculptors)

# Collaboration, HCI and other people

---

- Is all HCI collaborative?
- Non-experts can express themselves (be careful)
- Expression through gestures, objects, mapping
- Different types of physics
- Impress other people (who think hardware is difficult)

<http://rhoadley.org/gaggle>





<http://rhoadley.org/gaggle>

# Examples of Musical HCI

---

- **Bodyscapes** Gerhard Eckel (2009)



Bodyscapes

17 seconds

# Examples of Musical HCI

---

- **Beatbugs** MIT Toy Symphony



<http://rhoadley.org/gaggle>



Beatbugs

20 seconds



<http://rhoadley.org/gaggle>

# Examples of Musical HCI

---

- **Tooka** Fels and Vogt (New Interfaces for Musical Expression 2002)

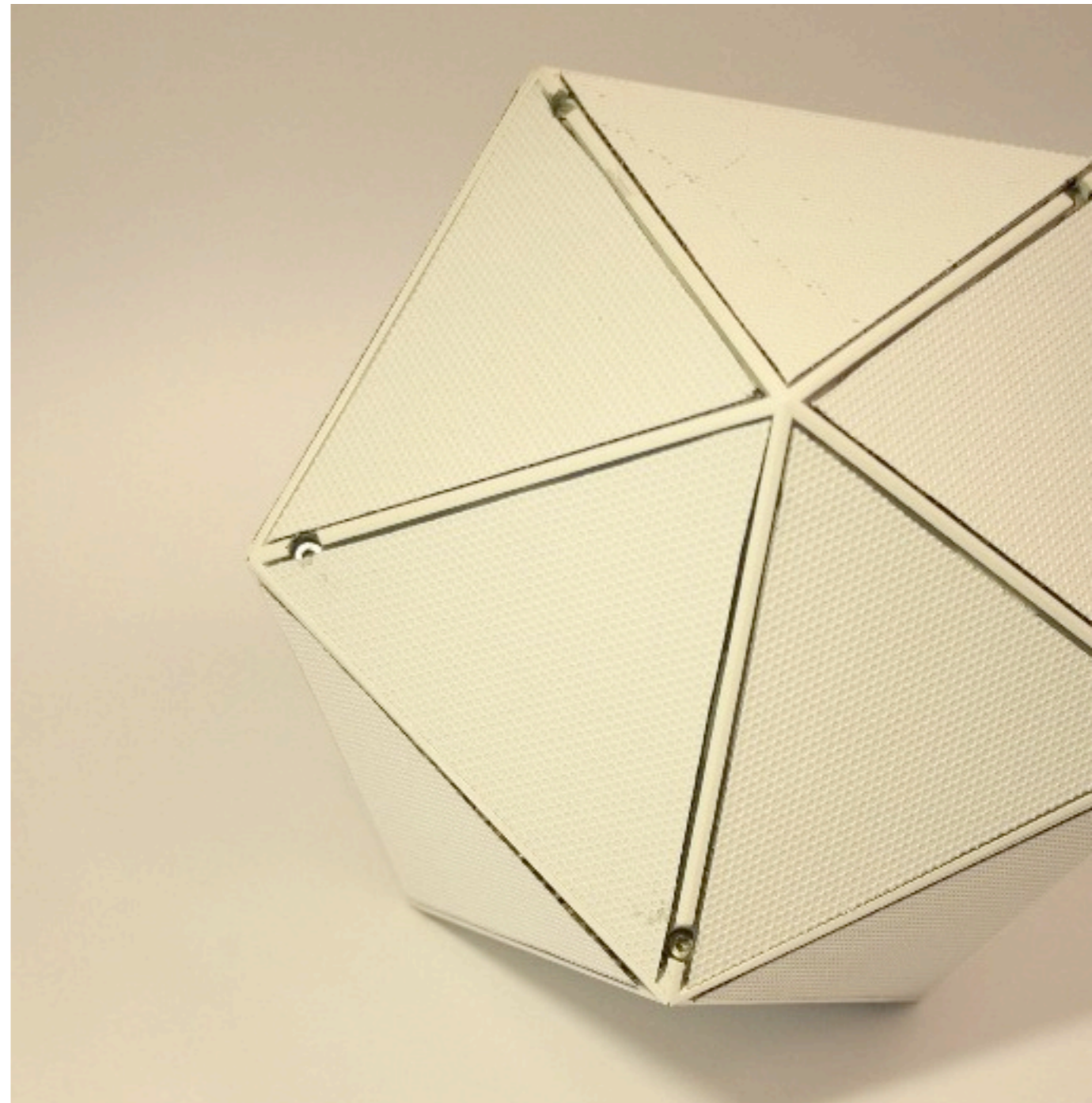


# Examples of Musical HCI

---

- **A20** Olivier Bau, Atau Tanaka, Wendy Mackay, (New Interfaces for Musical Expression 2008)

<http://insitu.lri.fr/~bau/a20.html>

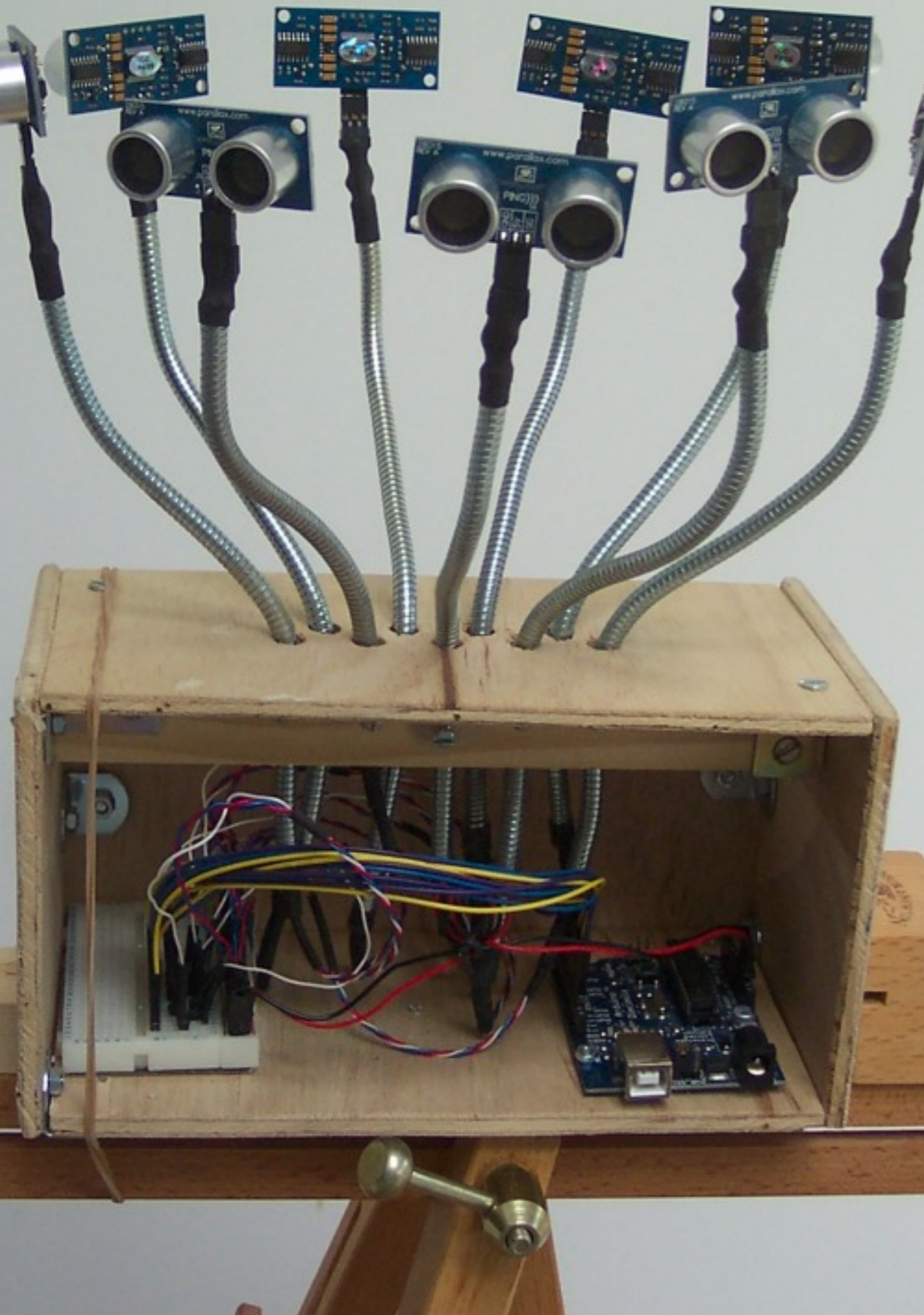




# Collaboration with people

---

- Collaboration with **Jane Turner's** dance troupe
- On the day we generated a plan during which amongst other activities the dancers would '**investigate**' Gaggle



# Gaggle

---

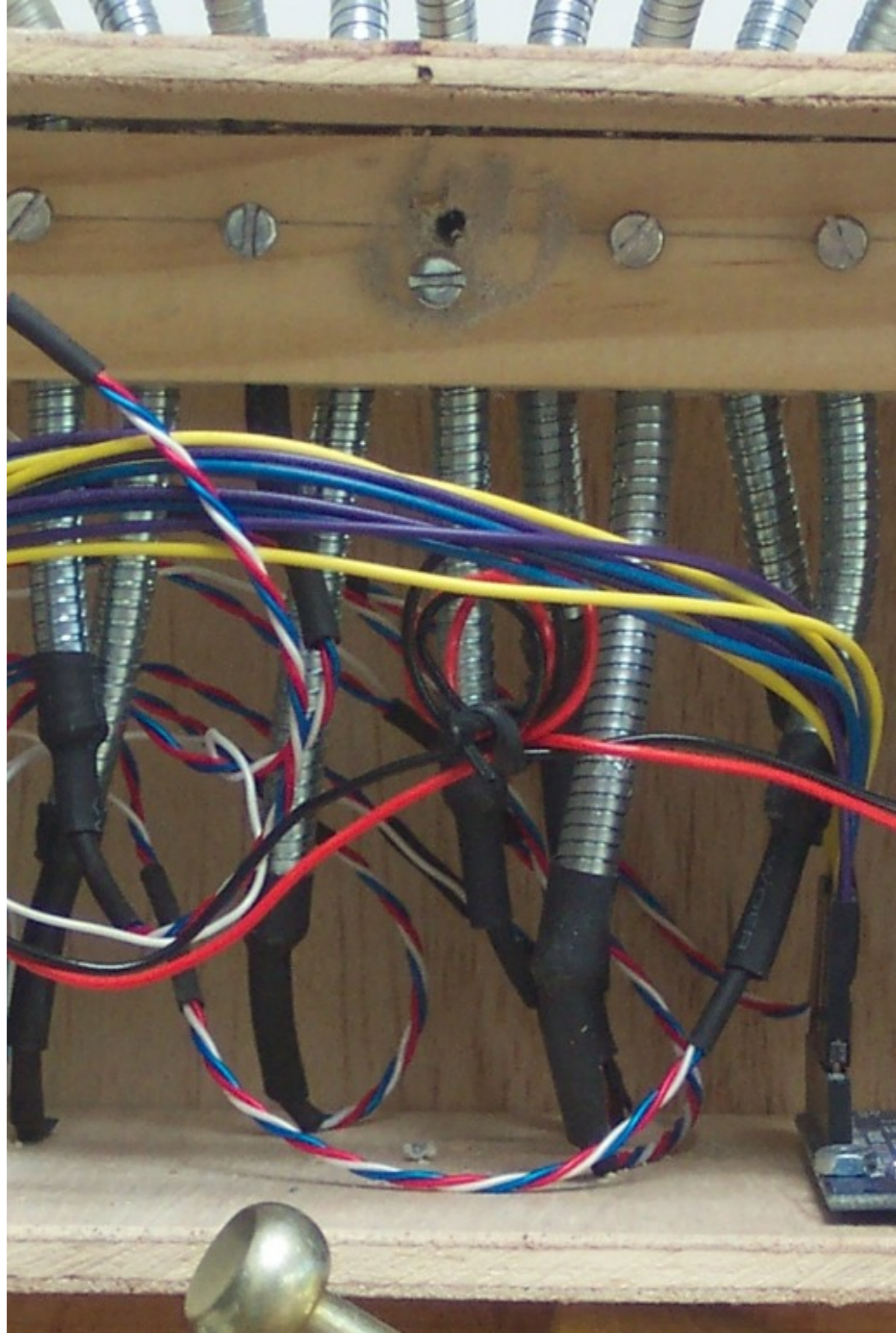
- Super-theremin?
- Interface with many (nine) ultrasound sensors making conscious operation difficult

# Gaggle

---

- **Ultrasound** -->
- --> **Arduino** (could be e.g. wiring, teabox, etc.) -->
- --> **Supercollider** (audio)

<http://rhoadley.org/gaggle>



# Rehearsal, performance and emergent behaviour

---

- **Emergent** behaviour
- No overall **narrative**
- Ideas emerge in **rehearsal** - one movement inspiring another
- Linked to the **object** itself
- Movements **formalised** for **performance**





Emergent behaviour:  
circling and weaving

25s



Clapping

7s



Staring and investigating

13s





Withdrawing

29s



## Flocking, herding

1m 15s



Pulsing, pushing

1m

# Summary of gestures

---

- Circling and weaving
- Clapping
- Staring and Investigating





# Summary of gestures

---

- Withdrawal
- Flocking and herding
- Pulsing



# Performance

3m 25s

# Future Developments

---

- The use of collaboration to develop performance, and then performance interfaces
- More units, different interactions
- Custom designs, clusters of sensors
- Expression, entertainment, therapy
- Interrelated dynamic systems

<http://rhoadley.org/gaggle>





## An example: approachables

---

- Proximity, touch, pressure;



# An example: mobile

---

- This example by Alexander Calder
- Kinetic, touch, proximity...
- Challenge: where do the wires go?



# Dangers and problems

- There's a **delight** and **spontaneity** about these interactions that may disappear with **too much labour**
- There are many, many examples
- Compromise
- Costs

```
File Edit Lang UI Format Window Help
GaggleDisplay_v0.014.rtf

// ~doingHaiku.postln;
if ( (a < ~myThreshold) && (~doingHaiku == false), { ~doHaiku.value; }
}

ping5: trigger a Finickey
msg[0] == 6 } {
  a = (~pings[4].mean/~gaggleCalibration);
  // a.postln;
  // ~doingHaiku.postln;
  if ( (a < ~myThreshold) && (~doingFinickey == false), { ~ssf.reset.play
}

ping6: trigger a Lag
msg[0] == 7 } {
  a = (~pings[5].mean/~gaggleCalibration);
  // a.postln;
  // ~doingLag.postln;
  // arg numDo=10, length=20.0, lengthRand=false, myWait=4.0, freqModfreq
  if ( (a < ~myThreshold) && (~doingLag == false), { ~myTextureLag.value
2.0.rand }, { 1.0 })); } );
}

ping7: Harp!
msg[0] == 8 } {
  a = (~pings[6].mean/~gaggleCalibration);
  b = ( ( ( a * 120 ) -120 ) * -1 );
  if ( (a < 0.5), { ~gagglePluck.value(b); } );
}

ping8: Lag index modulation
msg[0] == 9 } {
  a = (((~pings[7].mean/~gaggleCalibration)*11)-11)* -1.0);

  if ( ~doingLag == true, {
    ~ptl01.set(\indexVal, a);
    ~ptl02.set(\indexVal, a);
    ~ptl03.set(\indexVal, a);
    ~ptl04.set(\indexVal, a);
  }
}

server
- default prepare rec bot K inactive -> default prepare rec
Peak CPU : 21.3 % Avg CPU : % Peak CPU : %
Synths : 27 UGens : Synths :
SynthDets : 388 Groups : SynthDets :
ne : M 0

Gaggle
Gaggle 1 0
Gaggle 2 0
Gaggle 3 0
Gaggle 4 0
Gaggle 5 0
Gaggle 6 0
Gaggle 7 0
Gaggle 8 0
Gaggle 9 0
```

<http://rheadley.org/gaggle>



# Prospects

---

- **Desire** for **interaction**
- **Visual, visceral** and **haptic** aspects (sculpture)
- **Dynamic** levels of **expectation** and **surprise** for performers
- Real instruments and sounds



# Any questions...

---

- The Development of Music Interfaces Through Improvised Dance Movement



# The Development of Music Interfaces Through Improvised Dance Movement

---

**Richard Hoadley**

Digital Performance Laboratory  
Anglia Ruskin University  
Cambridge UK

[rheadley.org/gaggle](http://rheadley.org/gaggle)

[richard.hoadley@anglia.ac.uk](mailto:richard.hoadley@anglia.ac.uk)

Richard Hoadley 2009 v004



<http://rheadley.org/gaggle>