The Harmonium Project

- Launch event of the 2015 Edinburgh International Festival (EIF)
- To celebrate the 50th anniversary of the Edinburgh Festival Chorus
- Opening performance of the Royal Scottish National Orchestra

Project links

- Edinburgh International Festival
  - http://www.eif.co.uk/harmonium
- Blog piece about the data collection
  - www.eif.co.uk/blog/2015/harmonious-data
- Facebook
  - https://www.facebook.com/events/160668436231504/
- 59 Productions
  - http://59productions.co.uk/project/the_harmonium_project
- Press
  - http://www.scotsman.com/lifestyle/culture/usher-hall-to-be-lit-up-for-festival-show-1-3851942
**Conception**

- New director of the EIF (Fergus Linehan)
- A free, public, open-air extravaganza to kick off the Festival
  - in the end 19,500 attended the live event
  - twice the expected crowd
- Project a modern visual accompaniment to the audio onto the outside of the Usher Hall (where the actual performance took place)

**Background**

![Background Image]

**Critical link**

The visualisations were to be inspired and based on data generated from members of the chorus.

Data that did not exist at the time...

**John Adams’s Harmonium**

- Modern (1981) choral symphony
- Technically challenging
- Based on three poems:
  1. "Negative Love" by John Donne
  2. "Because I could not stop for Death" by Emily Dickinson
  3. "Wild Nights" by Emily Dickinson
Project partners

- Edinburgh International Festival
- Edinburgh Festival Chorus
- Royal Scottish National Orchestra
- 59 Productions
- University of Edinburgh
- Centre for Design Informatics

Wild nights ➔ wild promises

- **Objective:** “exploring transformations that bring data to life, or capture lives in data”.

- **Question (April 2015):** “What data can you generate for this?”

- **My response:** foolish answer promising too much using too many untested combined techniques (but potentially cool academic challenge). Usual problem.

Research opportunity

- Reading and performing music with multiple harmonious parts.

- Synchronisation of performance by 130 chorus members (plus an orchestra).

- Synchronisation of different biophysical channels.

Beyond the individual

The whole is greater than the sum of its parts.

- Aristotle, *Metaphysics, Book 8 1045a* (modern paraphrase) [also links with Gestalt psychology]
**Case study**

- Traditional human interaction enhanced with advanced technology.
  - Choirs + orchestra singing/performing together – highly controlled group work.
  - Error control: one person’s mistake can create a tsunami effect.
- Art & science combined product.
- Example of data gathering and data visualisation.
- Biophysical, biometric and social data suitable for affective/emotional analysis.
- Performance data fed back into the performance.

**Harmonious data**

**Four stages**

1. **In the wild** (Hadi Mehrpouya and Larissa Pshcetz, Design Informatics)
   - Monitoring heart rate of chorus members during the rehearsal
   - Geo-tracking for a week after the rehearsal (co-mob iPhone app)

2. **In the lab (more later)**

3. **Computational analysis of the text** (Claire Llewellyn, Informatics)
   - Analysis based on each word of each poem.

4. **Harmonium Experience App** (Martin Parker, Sound Design at ECA)
   - Recording the audience perspective during the show.

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**Harmonious data (2)**

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**Co-mob location tracking**

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Lab work

Active (while singing from a score)
  • Head-free eye-tracking
  • Electroencephalography (EEG)
    • (simple one-channel MindWave)
  • Heart rate
  • Facial movements (Microsoft Kinect)
  • Ultrasound

Passive (listening to Harmonium)
  • BioSemi 64-channel EEG

Tried to avoid this

Instead
Heart rate

Mindwave EEG

Example eyetracking data
Bass part

Comparison: singing from the same page
Data dump

The “Go” button

Kinect mapping
The official experience

2016 Deep Time (trailer)