Workshop 1
18th May, 2016

DATA-X
Pioneering Research Data Exhibition

INFORMATION SERVICES
THE UNIVERSITY OF EDINBURGH
Introduction to Data-X: Pioneering Research Data Exhibition

Stuart Macdonald
EDINA & Data Library
Background

- EDINA and Data Library (EDL) are a division within Information Services (IS) of the University of Edinburgh.

- EDINA is a Jisc centre for digital expertise providing national online resources for education and research.

- Data Library & Consultancy assists Edinburgh University users in the discovery, access, use and management of research datasets. The Data Library is part of the new Research Data Service.

Data Library Services:  [http://www.ed.ac.uk/is/data-library](http://www.ed.ac.uk/is/data-library)
EDINA:  [http://edina.ac.uk](http://edina.ac.uk)
Original Idea!

From ‘Where Data, Arts, and Humanities Meet’ paper presented at the International Association for Social Science Information Service and Technology (IASSIST), Univ. Minnesota, June 2015

Practitioners (digital humanities librarian, visualisation librarian, exhibitions curator) talked about their experiences reaching across disciplinary practices to access and connect with data.

See: http://iassist2015.pop.umn.edu/program/block3#a2
Evolving technologies and data-rich, researcher-driven environments provide new opportunities to share, publish and communicate research results.

Broadening of access to and availability of research data can be used to engender new research ideas and open up avenues for collaboration, further leveraging the value of a research investment.

Data-X aims to:

- Showcase collaborative research data 'installations' pioneered by research students with disciplinary expertise from across the three UoE Colleges.
- Upskill research students in cross-disciplinary data handling / manipulation / visualisation.
- Serve to demonstrate a discrete set of cross-disciplinary research outcomes.
Opportunity

- New ways of looking at data
- New ways of using data
- New ways of using skills and expertise
- New ways of assembling (and disassembling data)
- New practices and perspectives (techniques, technologies, tools, software)

We are all creative
No preconceptions
Project Team

Stuart Macdonald  (Project Manager)
Dr Rocio von Jungenfeld  (Exhibition Coordinator)
Scully Beaver Lynch  (PhD candidate in Architecture by Design)
Cindy Nelson-Viljoen  (PhD candidate in Archaeology)
Adela Rabell Montiel  (PhD candidate in Cardiovascular Sciences)
Siraj Sabihuddin  (PhD candidate in Electrical & Computer Engineering)
Micro-funding

c. £1500 in total for 3 workshops

Materials:
Groups receive £40 towards installation - workshop 1 & 2
Groups receive £60 towards installation - workshop 3

Awards*:
Workshops 1 & 2: 1st - £75; runner-up - £50
Workshop 3: 1st - £100; runner-up - £50

Sponsorship (in-kind / monetary) to contribute to best installation as voted at Exhibition

* Award will vary dependent upon number of installations
10:30 – 10:45 _ Introduction to project & micro-funds
10:45 – 11:15 _ Activity: minute of madness
11:15 – 11:45 _ Activity: Collective research mapping
11:45 – 12:00 _ Talk: What is data? Benefits of collaboration?

12:00 – 12:45 _ Lunch & networking

12:45 – 13:00 _ Talk: What can you make with data?
13:00 – 13:30 _ Activity: What data do you produce?
13:30 – 14:00 _ Activity: Spaghetti data structures
14:00 – 14:15 _ Vote for data structures & group formations

14:15 – 14:30 _ Wrap up & what’s next
Minute madness

Cindy Nelson-Viljoen
School of Archaeology
Research interests (1)

Goal - know who we are / what we do

3 post-its per person
→ 1 research interest / topic per post-it

Stick the post-its onto the wall

30 seconds to introduce:
→ yourself, your research field, your research interests
Collective research mapping

Rocio von Jungenfeld
EDINA & Data Library / ECA
Research interests (2)

Goal - identify collective research interests

3-9 tags per person
→ 1 research interest / topic per post-it

Use sticks to arrange tags

Bring sticks together (rubber bands)

Identify commonalities (link tags - wool)
Mapping framework developed by Dr Priscilla Chueng-Nainby, for more details see http://imageryweave.tumblr.com/workshops
What are data?
What are the benefits of collaboration?

Stuart Macdonald
EDINA & Data Library
Research data defined:

- Research data are collected, observed or created, for the purposes of analysis to produce and **validate** original research results.

- Data can be regarded as **situational** in that it can be created by researchers for one purpose and used by another set of researchers at a later date for a completely different research agenda.

- Data can be both analogue and digital.

- Digital data can be:
  - created in a digital form ('born digital') or
  - converted to a digital form (digitised)
Types of research data

- Instrument measurements
- Experimental observations
- Still images, video and audio
- Text documents, spreadsheets, databases
- Quantitative data (e.g. household survey data)
- Survey results & interview transcripts
- Simulation data, models & software
- Slides, artefacts, specimens, samples
- Sketches, diaries, lab notebooks ...

- **scientific experiments**, which may in principle be reproduced, although it may in practice prove difficult, or not cost-effective, to do so

- **models or simulations**, where it may be more important to preserve the model and associated metadata than the computational data arising from the model

- **observations** – from the astronomical to the zoological – of specific phenomena at a specific time or location, where the data will usually constitute a unique and irreplaceable record;

- **derived data**, resulting from processing or combining “raw” or other data (where care may be required to respect the rights of the owners of the raw data);

- **canonical or reference data relating**, for example, to gene sequences, chemical structures, or literary texts
Definitions*:

- **Cross-disciplinary**: viewing one discipline from the perspective of another.

- **Multidisciplinary**: people from different disciplines working together, each drawing on their disciplinary knowledge.

- **Interdisciplinary**: integrating knowledge and methods from different disciplines, using a real synthesis of approaches.

- **Transdisciplinary**: creating a unity of intellectual frameworks beyond the disciplinary perspectives.

Multidisciplinary collaboration

Multi-disciplinary research collaborations are becoming an increasingly important part of academic endeavour

They are seen as key to achieving insight beyond ‘conventional’ borders to generate new solutions to pressing, global-scale societal challenges, including:

green technologies and climate change
sustainable food production
urban development
population management
water-availability,
transport and energy systems,
drug development
Regulators and policy-makers have realized the power of such collaborations:


“As part of new funding announced in 2012, the NSF will issue a $2 million award for undergraduate training in complex data, whilst also encouraging research universities to develop interdisciplinary graduate programs in Big Data” - [https://royalsociety.org/~/media/Royal_Society_Content/policy/projects/sape/2012-06-20-SAOE.pdf](https://royalsociety.org/~/media/Royal_Society_Content/policy/projects/sape/2012-06-20-SAOE.pdf)
OECD Principles and Guidelines for Access to Research Data from Public Funding (2007)

“...improved access [to research data] was generally seen as benefitting the advancement of research, boosting its quality and facilitate cross-disciplinary research co-operation.” - https://www.oecd.org/sti/sci-tech/38500813.pdf

Science as an Open Enterprise (Royal Society, 2012)

“Science is increasingly interdisciplinary: the boundaries between previously distinct fields are blurring as ideas and tools are exported from one discipline to another ... effective access to data resources are important in this transition, but more proactive data sharing is necessary if new opportunities are to be seized.” - https://royalsociety.org/~/media/Royal_Society_Content/policy/projects/sape/2012-06-20-SAOE.pdf

“For higher education institutions to foster a more collaborative approach to the development of cross-disciplinary research skills and data analysis.” - http://www.esrc.ac.uk/files/research/uk-strategy-for-data-resources-for-social-and-economic-research/

RCUK Concordat on Open Data (Aug. 2015)

“Access to data across many fields is also stimulating new types of thinking as researchers develop new understandings by bringing together data from a variety of sources. This is enabling new perspectives on multi-disciplinary problems across a wide variety of fields from the life sciences, engineering and physical sciences to the arts, humanities and social sciences” - http://www.rcuk.ac.uk/research/opendata/
Why interdisciplinary research matters (Nature, Sept. 2015)

“To solve the grand challenges facing society — energy, water, climate, food, health — scientists and social scientists must work together” - http://www.nature.com/news/why-interdisciplinary-research-matters-1.18370

Further Reading:


Cross-disciplinary collaborations can be challenging but highly rewarding, some benefits include:

Learning about ‘new ways of thinking and doing’ cutting-edge research from researchers from other disciplines

Exposure to, learning from (and sharing of) different terminologies, classification schemes, methods, workflows, standard operating procedures, protocols, technologies, definitions (e.g. data)

Understand different work practices across disciplines such as reward models (publication speeds, impact factors, author ordering) and research pace (experiments, computational power)

Opportunity to develop, nurture and maintain working relations with peers from other disciplines (for future (funded) endeavours)
A Data Future:

New skills:

- (Big Data) Data analysts (R, Python, SPSS, SAS, PHP)
- Data carpentry (software skills & tools for effectively working with data)
- Data journalists (journalism specialty reflecting the role of numerical data in the production and distribution of information in the digital era)
- Data wranglers (munging, mining, handling, manipulating)
- Data technicians, Data scientists
“The ability to take data - to be able to understand it, to process it, to extract value from it, to visualise it, to communicate it – that’s going to be a hugely important skill in the next decades.”

*Hal Varian, Google’s chief economist.*

“Data is the New Gold”

*Neelie Kroes (Vice-President of the European Commission)*, announcing the EU’s Open Data Strategy

“The coolest thing to do with your data will be thought of by someone else”

*Rufus Pollock, Founder and President of Open Knowledge Foundation*
Lunch & network
What is an installation?
What can you make with data?

Rocio von Jungenfeld
EDINA & Data Library / ECA
Installation! What do we mean?

An installation can be made of many different things

There is no recipe!

It’s something you install for others to engage with

Different ideas require different materials / approaches

Spatially arranged to enable public to access it
What can you make with your research data?

Affording different ways of making

Convert data into some sort of physical / tangible form:

- prints (2D / 3D - analogue / digital)
- performances
- moving images / stills
- bio-displays
- projections
- kinetic structures
- sonified environments
- sensing systems
- interactive objects
- laser cut objects
- applications (mobile / tablet)
- sculptures (wide range of options)
Nathalie Miebach
Harold Fisk (1944) - Mississippi
Asphyxia by Maria Takeuchi and Frederico Phillips

Shiho Tanaka
Lisa Park
Examples of what you can do with data

Links to some works

Nathalie Miebach - https://youtu.be/1ES4Ds7ApQw


Asphyxia - http://www.asphyxia-project.com/

Lisa Park - http://www.thelisapark.com/
Any other data visualisations, installations, sonifications, prints, etc which you want to add to the mix?

If time allows, can we find them online?
What data do you produce?

Adela Rabell Montiel
Queen's Medical Research Institute
Your data (1) - identify your data (a)

Group _ avoid same school / field

Write words related to the data you work with:
→ single phrases / concepts in each post-it
→ be explicit, you may be surprised!

- FILM STILLS
- BUILDING OVERLAPPING
- CaCO3
- SEASHELLS
- HIGH FREQUENCY ULTRASOUND
- MAGNETIC FIELD
Your data (1) - continuation

Cluster / group post-its (relations)

Choose one cluster (focus theme)

Contextualise the post-its:
→ Describe your research your group
→ One person has to summarise (ensure ideas sink in)

Ask questions to each other!
Spaghetti data structures

Siraj Sabihuddin
School of Engineering
Your data (2) - building your data

Groups _ create a data structure

Select a theme and make a label with your team name

Use theme and sketch an idea for a structure

Implement your idea (spaghetti and styrofoam blocks)

Build on top of coloured paper (size restricted to paper)
Your data (2) - example
Vote & micro-funds allocation

Scully Beaver Lynch
School of Architecture and Landscape Architecture
Wrap-up

Stuart Macdonald
EDINA & Data Library
Topics gathered for collective research mapping

Getting very big datasets across
Projections
Physics
Big Data
German History
Walking
Modernist literature and technology
Oxygen isotopes
Architectural drawing convention
- transition into design
1944-45
Alternative mappings of spaces
Hysteresis
Poetry and art
Adaptive learning & context awareness
Radicalisation of behaviour
Mapping space
Architecture
3D printing
Combining visuals & music algorithmically

Relative space
Quality image
Electronic mediation
Rhythmic cycles
Ultrasound imaging
Museums
Topology / topography
Cyberpunk / cyborg subjectivity
Musical structure
Emotional impact of Astronomy
Military architecture
Tuning systems
Magnetism
Domestic space
Radicalisation of behaviour
Man-machine interface
Human subsistence
Shell chemistry
Spatial cognition
Topics arranged by UoE College

**Arts and Humanities**
- Architectural drawing convention
- German History
- Modernist literature and technology
- Poetry and art
- Radicalisation of behaviour
- Architecture
- Combining visuals & music algorithmically
- Relative space
- Rhythmic cycles
- Cyberpunk / cyborg subjectivity
- Musical structure
- Emotional impact of Astronomy
- Military architecture
- Tuning systems
- Domestic space
- Radicalisation of behaviour
- Human subsistence

**Science & Engineering**
- Physics
- Oxygen isotopes
- Projections
- Hysteresis
- Mapping Space
- Shell chemistry
- Spatial cognition
- Topology / topography
- Magnetism
- Man machine interface

**Medicine & Veterinary Medicine**
- Ultrasound imaging

**Discipline agnostic**
- Getting very big datasets across
- Big Data
- Projections
- Walking
- 1944-45
- Alternative mappings of spaces
- 3D Printing
- Adaptive learning & context awareness
- Quality image
- Electronic mediation
- Museums
Enthusiasm / desire to deliver

Networking / informal

Creating linkages / building research relationships

- Go beyond this workshop

Pace of discussion and domain methods

Flexibility - workshop format

Meetings encouraged moving forward (informal / formal)

PhD Interns points of contact within respective Colleges
Your projects - development timeline

Timeframe: May - November 2016

Repeat workshop 1 → June

Workshop 2: refine ideas, get more funds for your project → June

Project development / collaboration / sponsorship → Jun - Nov

Project presented in “Data-X Exhibition” → Nov - Dec

Present your project at “Data-X Symposium” → Nov - Dec

Publish collaboration in “Data-X Catalogue” → January 2017
Feedback

Questions?

http://data-x.blogs.edina.ac.uk/

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