Asking the right questions about eResearch

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THE UNIVERSITY OF MELBOURNE

RDSI Research Data Storage Infrastructure

nectar

NCRIS National Research Infrastructure for Australia
An Australian Government Initiative

VicNode

ands AUSTRALIAN NATIONAL DATA SERVICE

University of Melbourne background

- Set within the Parkville and wider City of Melbourne Knowledge precinct.
- A comprehensive and research-centric University – the no. 1 University in Australia – across a broad range of fields
- $1B/year expenditure in Research with ~ 5K RHD and ~3K academics
- Made up of 10 diverse discipline based faculties
- The university also sits within a strong social sciences precinct, including • Melbourne School of Government, Melbourne Institute of Applied Economic and Social Research, the Melbourne Social Equity Institute and the Centre of Advancing Journalism, Oxfam, The Conversation, and so on..

How to talk about eResearch? (vision)

The vision & questions a university aims for and asks are important, as we often focus on infrastructure and services, and not research practice and collaboration which is what we are trying to support and *change*.

- A key need/skill for an increasingly data-rich world: access to the fundamental structure, principles, and ramifications of data-analytic thinking are really important for research
- This new way of thinking will need to recognise that real-world problem domains generate new challenges that are often best **recognised by researchers who are steeped in a domain** (novel research outcomes will be possible through the exploitation of computational and data methods in a domain specific way)
- The University will need to embrace this new way of thinking to meet its teaching and research aspirations.
- Methods, expertise, software use/reuse/development, data holdings of precinct/national/international relevance and the building & maintaining of communities around these ‘new types of infrastructure’ will be key.

How to talk about eResearch? (questions)

5. How can we build or consume a set of underpinning platforms which overall strike a balance between general and special needs, as well as collaborative and private research, and small to large scale research needs? And how can we best assist the community in using those platforms?

9. How do we design and operate physical working spaces that host and promote collaboration between disciplines, technologists and other expertise, supporting data-centric research?

10. How can we proactively establish research partnerships between software developers, computational scientists and researchers, exploiting computational and data methods in a domain specific way, resulting in fundamentally new research outputs?

15. How can we build, support and maintain communities of practice, groups that grow around infrastructure, digital tools, methods, areas of expertise and data holdings.

Alistair Walsh

PhD Candidate; Cognitive Neuroscience
@MelbUni

My research: **Neurofeedback and Brain Computer Interfaces**

I study voluntary cortical self modulation and it's use in therapy and novel interfaces. I'm a strange fish that is equal parts hardware engineer, software developer and psychologist because the field is new it is still 'some assembly required'.

My digital toolbox

OS: **OS X 10.9.5/ Linux Mint**

Data analysis: **Anaconda Python**

Text editing: **Text Wrangler /Sublime Text**

Document editing: **LaTeX/RStudio**

Presentation: **iPython/Sage math cloud**

Code repository: **Github**

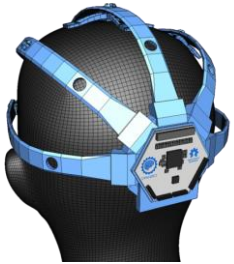
My favourite tool: **iPython**

iPython has made documenting and sharing scientific computing straight forward. I use it as a logbook, to do analysis, as a teaching aid and to talk to hardware devices.

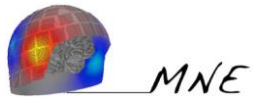
I've got my eyes on: **Julia/ Web Browser**

I have a soft spot for R and Julia promises to combine all the best parts of scripting languages with the speed of a compiled language.

It's dawning on me how important it is to understand HTML, CSS and javascript. The web browser is a universally understood interface and it's on every device.



Anaconda



Already know how to code data.

Actively learning how to code data.

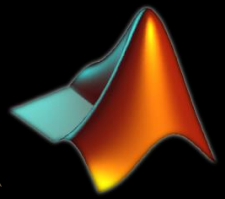
Very interested in what coding data has to offer.

Asking data-coding Q's.

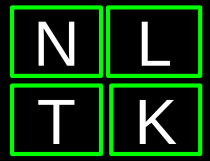
Physicists | Biologists | Zoologist | Sociologists | Philosophers

Mathematicians | Chemists | Geologists | Engineers | Humanist | Arts

"...next gen digi res skills..."





-fortran - matlab - ipython - rstudio - galaxy - autodesk - inventor - tinkercad - 3d slicer - natural language processing toolkit - tilemill - cartodb - authorea - spreadsheets - gapminder - document authoring - latex - figshare - openstack - etc - etc -

Code & data will be the lingua franca of the future university.
What are the range of skills required in this future University?
(What will research departments have to balance strategically?)