Advantages and Challenges of Computational Thinking in the Humanities

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The Computational Revolution

- The Computational Revolution has impacted and is now affecting all parts of life
- Computational is still becoming increasingly prevalent in the economy, society and research

Named entity recognition

Search engines

Sentiment Analysis

Question answering

Text-2-Speech / Speech-2-Text

Topic Modelling

Machine translation

Part-of-Speech tagging

Spelling correction

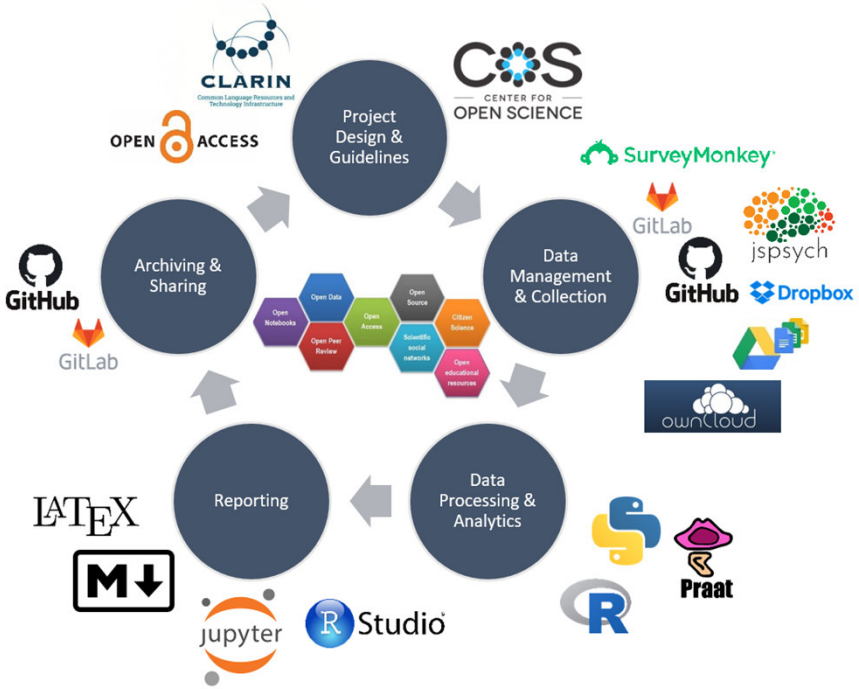
Speech recognition

Syntactic / Dependency parsing

Humanities and Computing

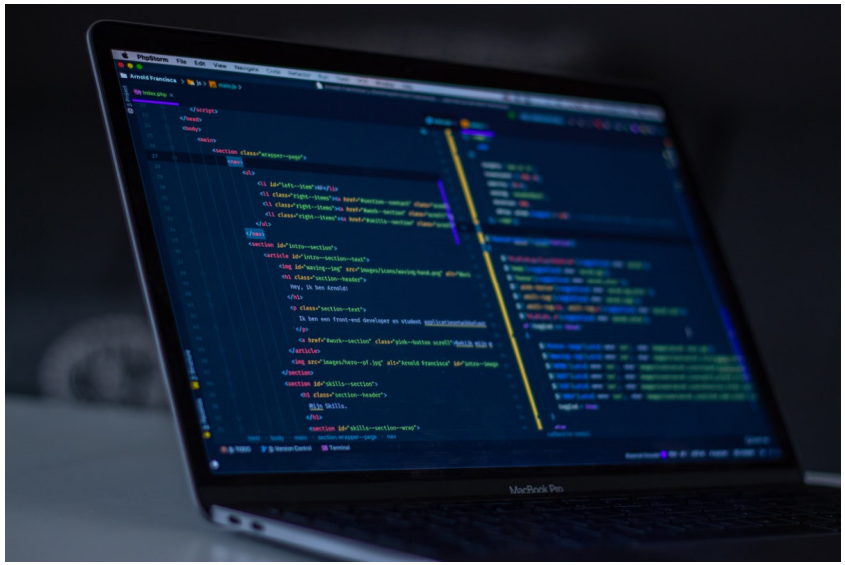
Vast potential for the humanities by extending computational methods to humanties research

- Adopting “computation” is essential for research in the humanities
  - to tap into **new opportunities** (new avenues for research)
  - to **keep pace** with other fields
  - to remain **internationally competitive**
  - to transform findings into **tangible applications** (e.g., language learning apps)
- **Research Quality**
  - Reproducibility, Transparency, and Efficiency
  - Open Science and Public Engagement



State of the Art: Computation in the Humanities

- Partial awareness of the issue
  - some journals require or support pre-registration and sharing of data or code
  - (Sub-)fields are emerging
    - literary stylistics
    - digital humanities
    - corpus linguistics
    - computational linguistics)
- Increasing demand for training and education in computational methods
- Training in such skills is also increasingly demanded by students of the humanities (employability)



Challenges, Issues, and Problems

- General attitude of unaffectedness and irrelevance of transparency and reproducibility
- Unwillingness to change accustomed practices
- Different tradition to natural sciences
  - Adopting best practices
  - Transparency in research: access to / sharing of data
- (Over-)reliance on existing (commercial) tools
- Vastly different needs across disciplines: differences in experience, research practices, and expectations
- **Lack of training, programs, resources and infrastructure** (materials and training for both for general and specialized audiences)

Implications

We need a range of experts for and skills in computation to grow in the humanities

- Computational linguists
- Data scientists and analysts

Important: must have HASS backgrounds

Humanities scholars who have data science skills play a key role in training other researchers but Australia currently has a significant shortage of people with the right combination of skills in humanities research and computing

→ New programs and systematic collaboration is needed between research units in universities, university libraries, and IT departments to address this skills shortage

Language Technology and Data Analysis Laboratory (LADAL)

eResearch support infrastructure for computational humanities

Basics of empirical research and **data management**

- Computational skills and **(basic) programming**
- Data extraction / transformation / processing
- Data **visualization**
- Data Analysis (**Statistics** and Machine Learning)
- **NLP** applications (text analysis)

→ Enhance existing research programs

→ Offer pathways into new research possibilities

Thank you

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