The Turing Way: A handbook for reproducible data science

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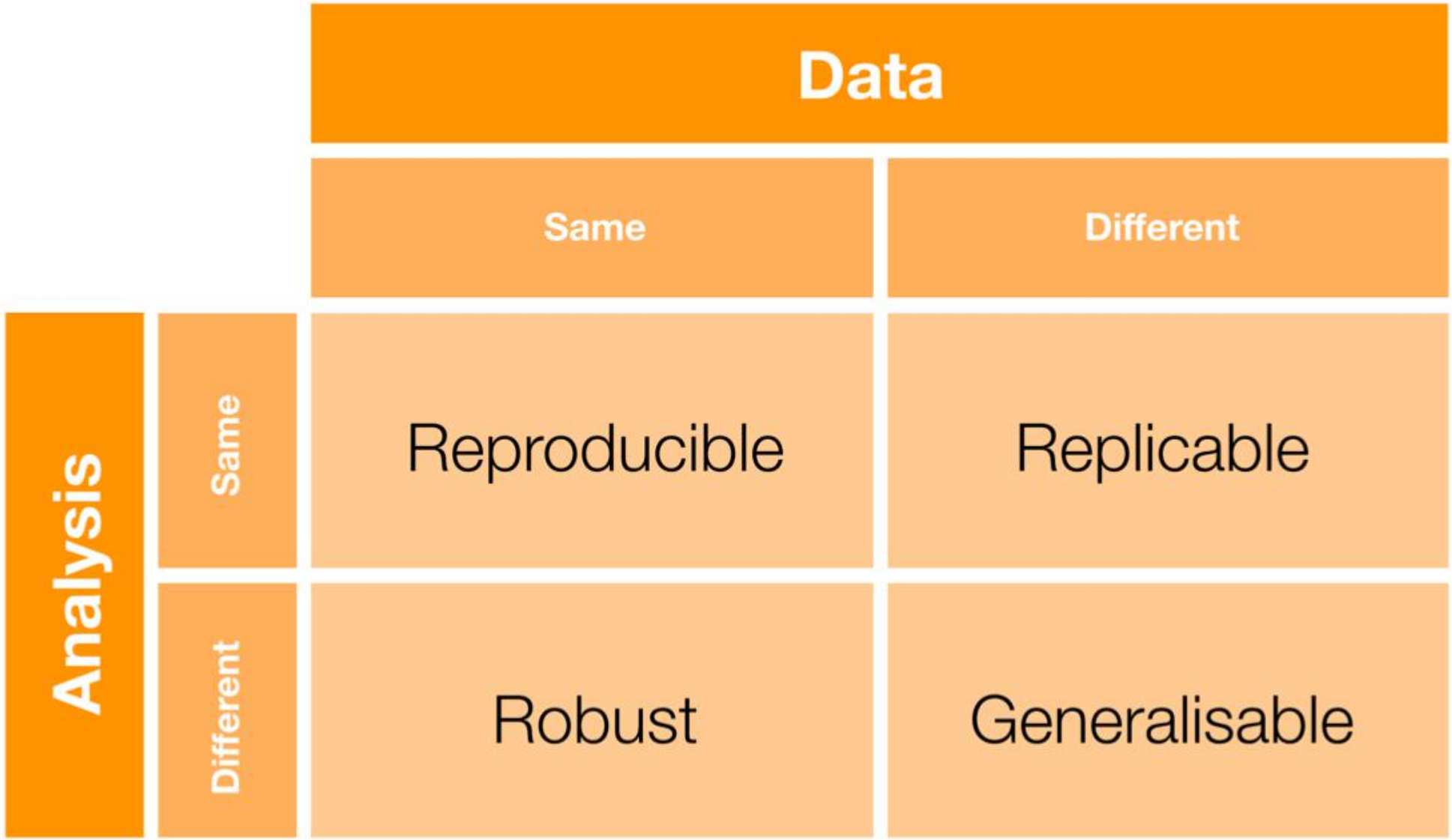
Software Sustainability Institute, University of Manchester

Open Science Fair 2019 Demo
Link to slides: https://doi.org/10.5281/zenodo.3403161

About Me

- Community Manager for the Software Sustainability Institute (SSI)
- Previously an Astrophysical Researcher at:
  - Jodrell Bank Centre for Astrophysics
  - Dublin Institute for Advanced Studies
  - Trinity College Dublin
  - NASA Jet Propulsion Laboratory
  - University of Tennessee
- Open Science Advocate
  - Mozilla Open Leader (Rounds 4, 5, 6)
  - FOSTER Open Science Trainer
  - Turing Way team member
  - Open Science MOOC contributor
  - TEDx speaker
- Women in data meetup group HER+Data MCR Organiser



Whitaker (2018) https://doi.org/10.6084/m9.figshare.7140050.v2

Barriers to reproducible research

Is not considered for promotion

Held to higher standards than others

Publication bias towards novel findings

Requires additional skills

Plead the 5th

Support additional users

Takes time

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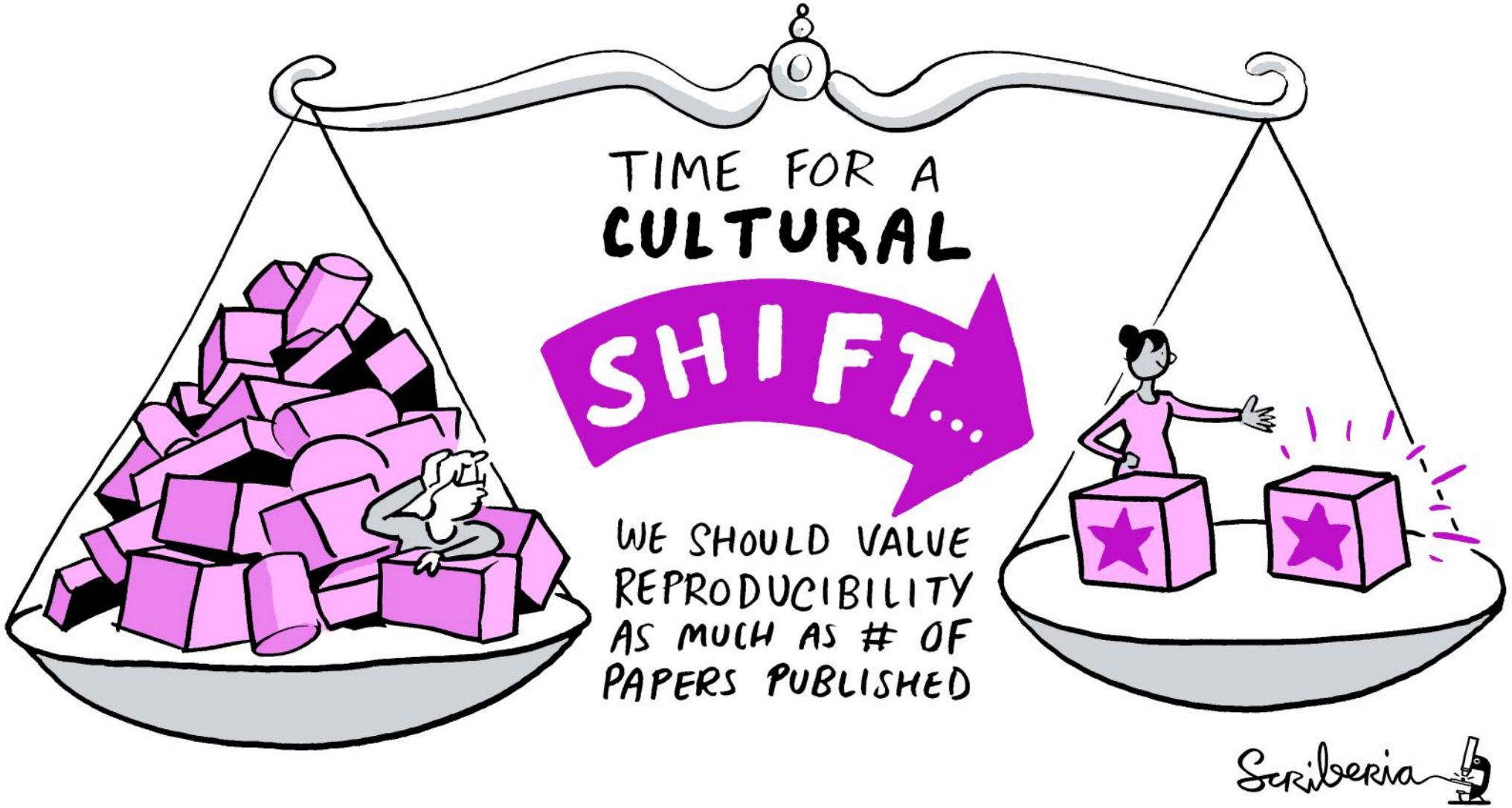
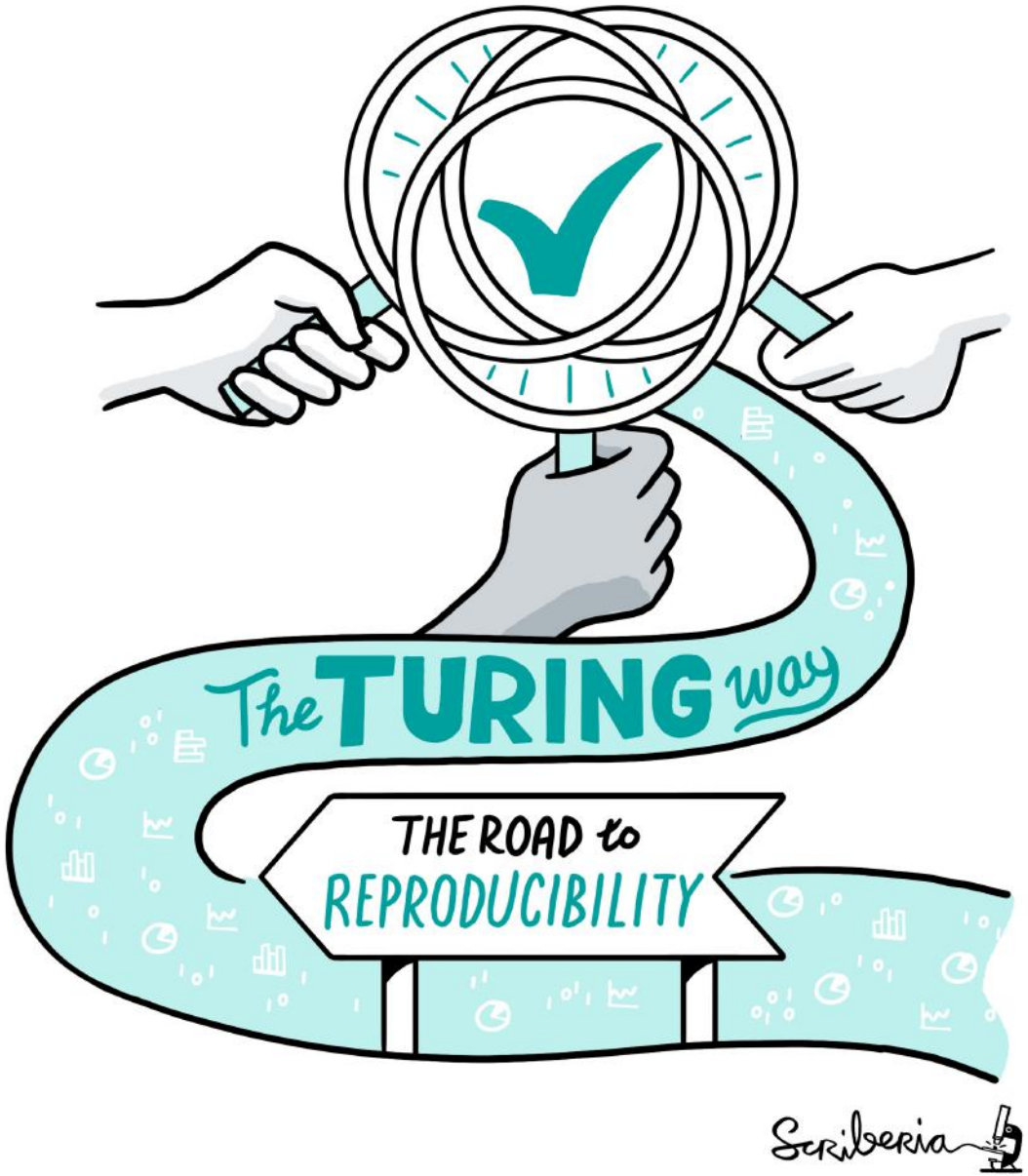


The Turing Way Community & Scriberia, http://doi.org/10.5281/zenodo.3332808

The Turing Way

- Project to make reproducible research “too easy not to do”
- Collaboration of researchers, research software engineers and librarians
- Initially a 7 months project from November 2018 to May 2019
- Has been awarded another round of funding from the Tools, Practices and Systems branch of the AI for Science and Government programme at the Alan Turing Institute – next 18 months
- In short: The Turing Way encompasses a book, community, collaboration, workshops & training

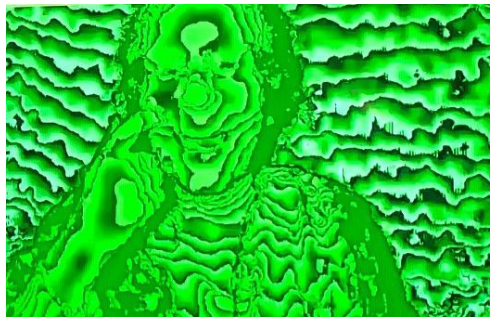


The Alan Turing Institute

- The UK's national institute for data science and artificial intelligence, with headquarters at the British Library
- University network
- Industry partners and collaborators

The Turing Way team

Rachael Ainsworth



Becky Arnold

Louise Bowler

Sarah Gibson

Patricia Herterich

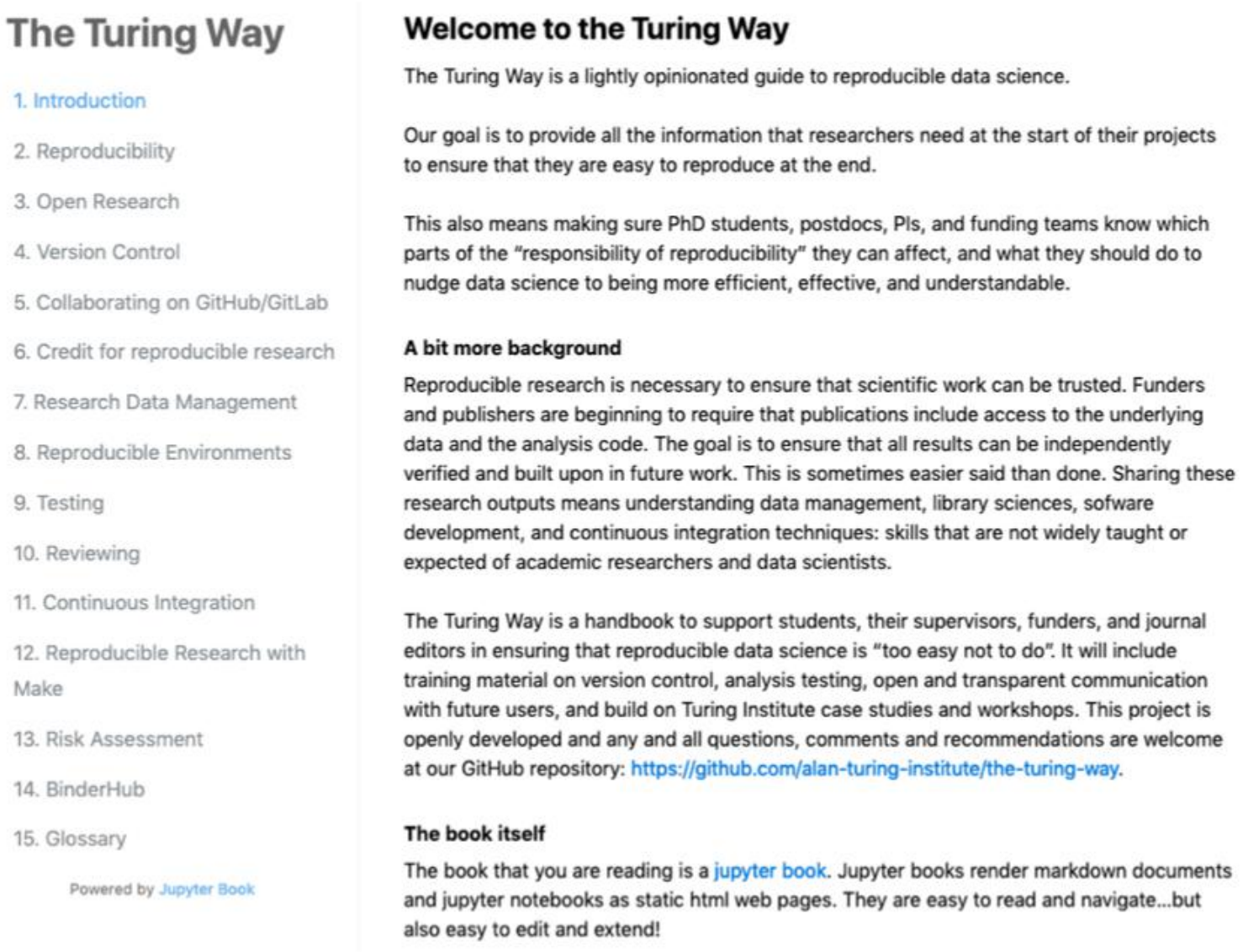
James Hetherington

Rosie Higman

Anna Krystalli

Catherine Lawrence

Kirstie Whitaker



The Turing Way

1. Introduction
2. Reproducibility
3. Open Research
4. Version Control
5. Collaborating on GitHub/GitLab
6. Credit for reproducible research
7. Research Data Management
8. Reproducible Environments
9. Testing
10. Reviewing
11. Continuous Integration
12. Reproducible Research with Make
13. Risk Assessment
14. BinderHub
15. Glossary

Powered by Jupyter Book

Welcome to the Turing Way

The Turing Way is a lightly opinionated guide to reproducible data science.

Our goal is to provide all the information that researchers need at the start of their projects to ensure that they are easy to reproduce at the end.

This also means making sure PhD students, postdocs, PIs, and funding teams know which parts of the "responsibility of reproducibility" they can affect, and what they should do to nudge data science to being more efficient, effective, and understandable.

A bit more background

Reproducible research is necessary to ensure that scientific work can be trusted. Funders and publishers are beginning to require that publications include access to the underlying data and the analysis code. The goal is to ensure that all results can be independently verified and built upon in future work. This is sometimes easier said than done. Sharing these research outputs means understanding data management, library sciences, sofware development, and continuous integration techniques: skills that are not widely taught or expected of academic researchers and data scientists.

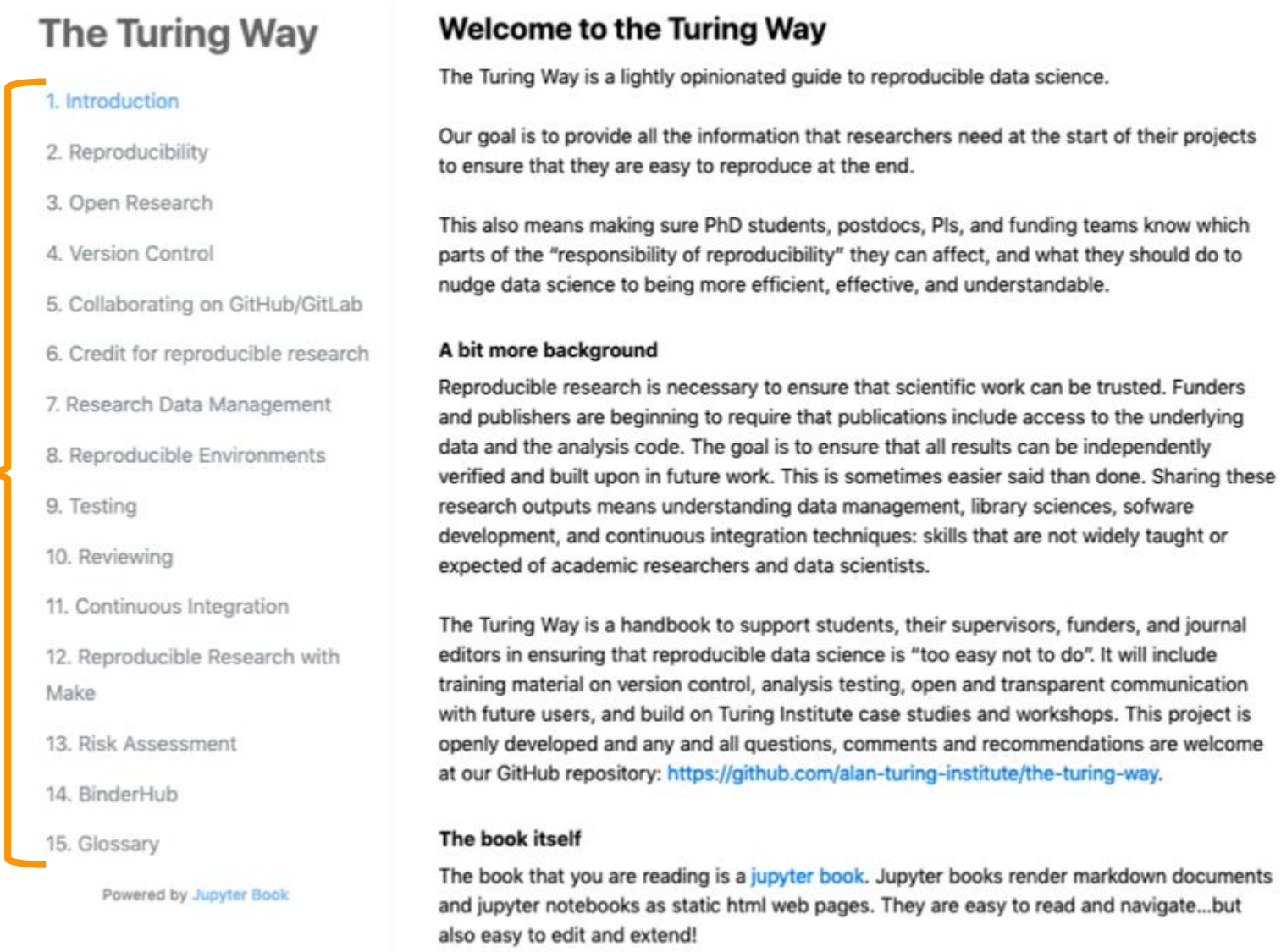
The Turing Way is a handbook to support students, their supervisors, funders, and journal editors in ensuring that reproducible data science is "too easy not to do". It will include training material on version control, analysis testing, open and transparent communication with future users, and build on Turing Institute case studies and workshops. This project is openly developed and any and all questions, comments and recommendations are welcome at our GitHub repository: https://github.com/alan-turing-institute/the-turing-way.

The book itself

The book that you are reading is a jupyter book. Jupyter books render markdown documents and jupyter notebooks as static html web pages. They are easy to read and navigate...but also easy to edit and extend!

https://the-turing-way.netlify.com

Chapters on



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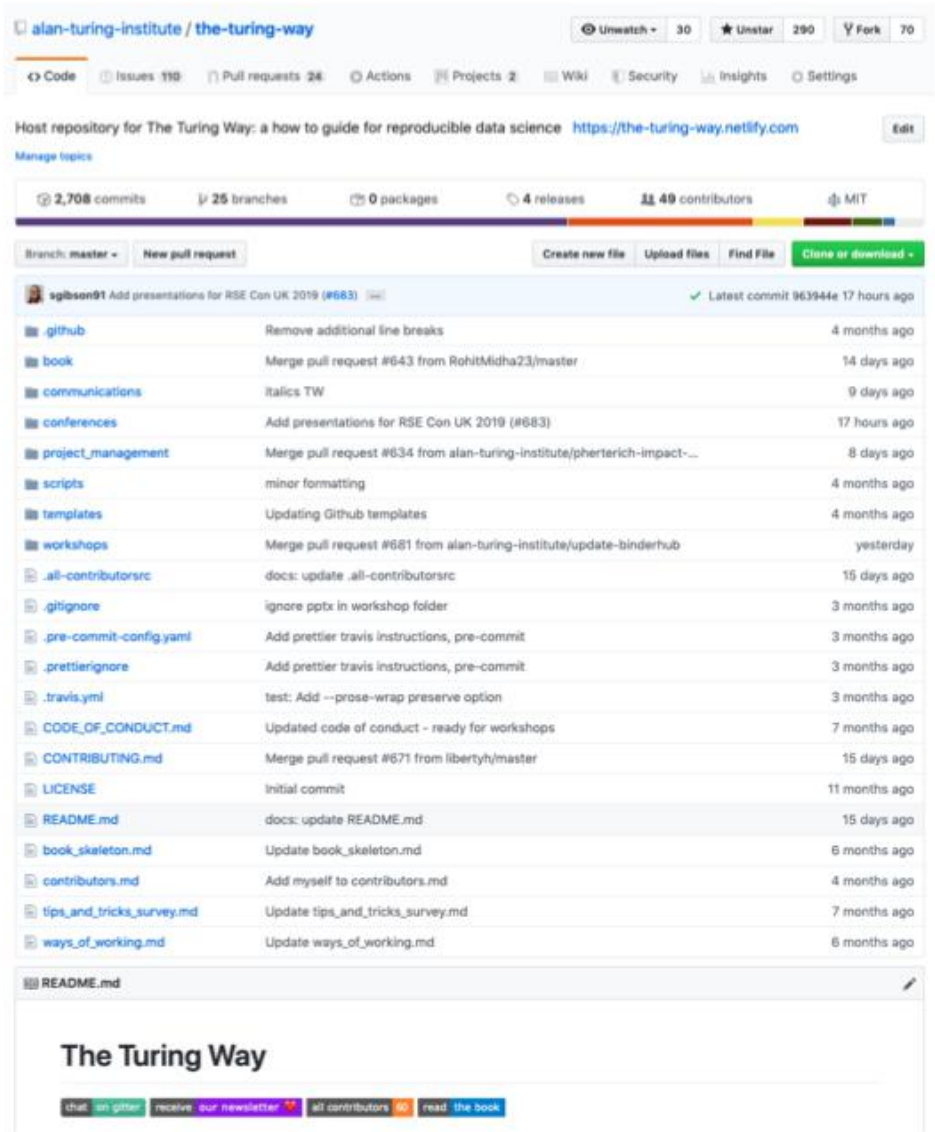
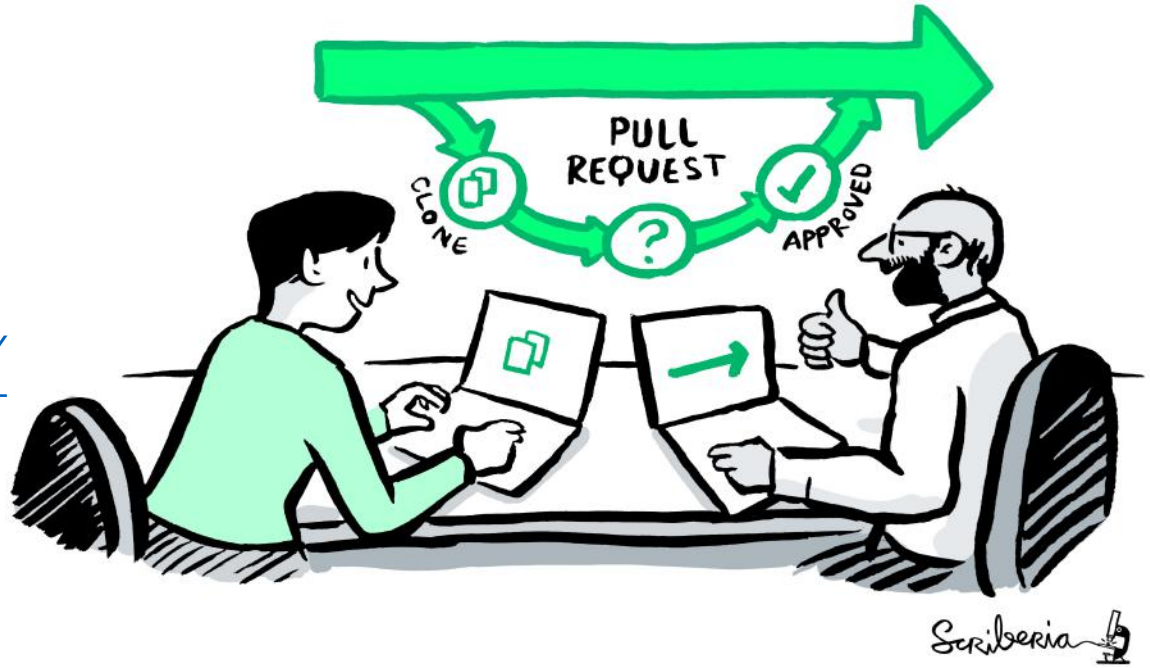


https://github.com/alan-turing-institute/the-turing-way

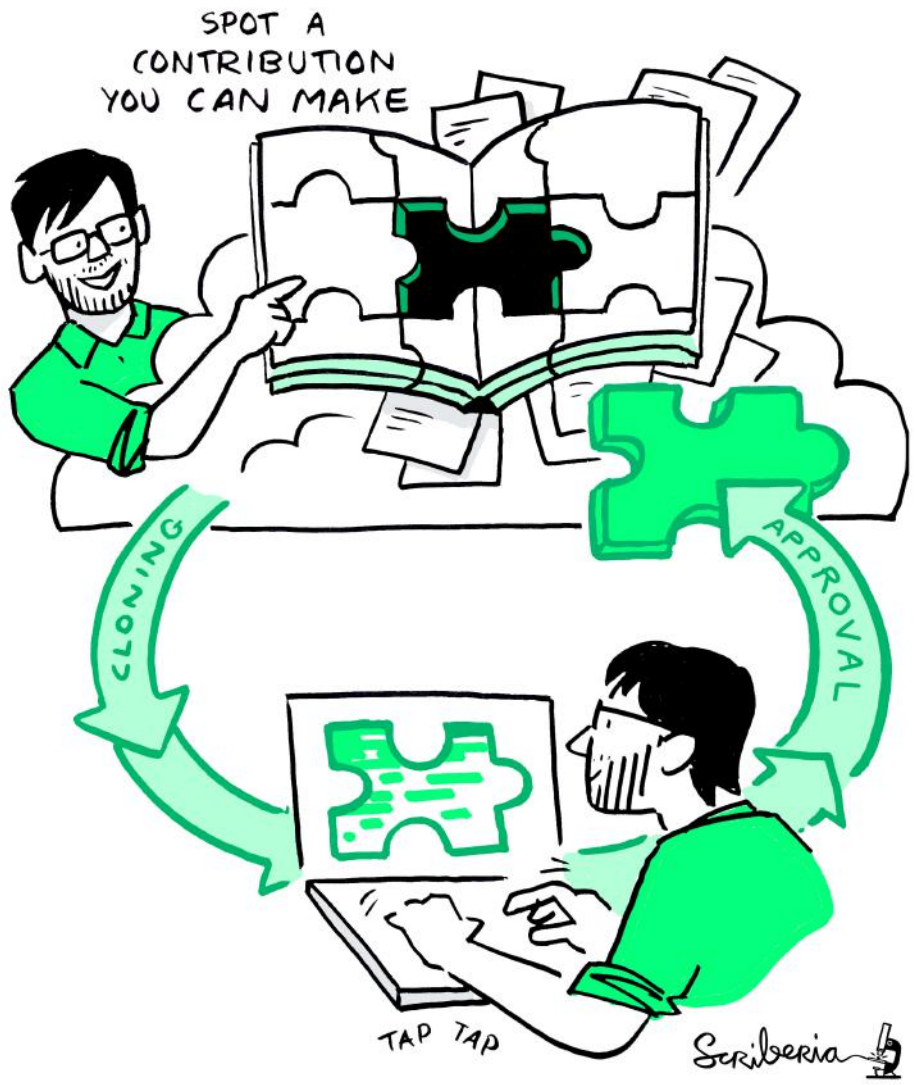
Pages to demo:

- Netlify page: the-turing-way.netlify.com
- GitHub repo: github.com/alan-turing-institute/the-turing-way
  - README & contributors
  - Contributing Guidelines
  - Issues
  - Pull Requests
- Google Form: http://bit.ly/2GH8QyY



How can you get involved?

- Check out the list of open issues in our GitHub repository
  - Edit existing chapters or suggest topics for new chapters (particularly if you can write them!)
  - A chapter can be 3 paragraphs in length - what can you write 3 paragraphs on?
- What skills or tools do you wish you had been taught at the start of your research career?
- Submit a case study or your tips and tricks for reproducible research via our Google submission form: http://bit.ly/2GH8QyY
- Checklists
- Creative, out of the box ideas!
- We have Collaboration Cafes every 2 weeks



Contact


github.com/alan-turing-institute/the-turing-way

the-turing-way.netlify.com

doi.org/10.5281/zenodo.3233986

zenodo.org/communities/the-turing-way


gitter.im/alan-turing-institute/the-turing-way


#TuringWay


https://tinyletter.com/TuringWay

Software Sustainability Institute

Collaborations Workshop 2020 (CW20)

Twitter: #CollabW20

The Software Sustainability Institute's Collaborations Workshop series brings together researchers, developers, innovators, managers, funders, publishers, leaders and educators to explore best practices and the future of research software. Collaborations Workshop 2020 (CW20) takes place from Tuesday 31st March to Wednesday 1st April 2020 at Queen's University, Belfast. The CW20 Hack Day takes place on the evening of Wednesday 1st of April to end of the working day Thursday 2nd of April at Ulster University, Belfast.

The themes at CW20 are:

- **Open Science**
- **Data Privacy**
- **Software Sustainability**

Hold the date! **Sign up the newsletter to find out when registration is open.**

Take a look at the **Highlights from Collaborations Workshop 2019** and the **videos on better and sustainable research software** to better understand what happens at a Collaborations Workshop. Also please read the various blog posts from previous **Collaborations Workshops** to better understand why you should attend and what you will gain.

https://www.software.ac.uk/cw20

Acknowledgements

- The Turing Way is supported by the UKRI Strategic Priorities Fund under the EPSRC Grant EP/T001569/1, particularly the “Tools, Practices and Systems” theme within that grant, and by the Alan Turing Institute under the EPSRC grant EP/N510129/1
- Attribution for all illustrations: The Turing Way Community and Scriberia: http://doi.org/10.5281/zenodo.3332808
- The work carried out by the Software Sustainability Institute is supported by the UK Engineering and Physical Sciences Research Council (EPSRC) through grant EP/H043160/1 and EPSRC, BBSRC and ESRC Grant EP/N006410/1 and EPSRC, BBSRC, ESRC, NERC, AHRC, STFC and MRC grant EP/S021779/1