# The Alan Turing Institute

## The Turing Way:

Guide to Reproducible, Ethical and Collaborative Research

Malvika Sharan

Pronouns: she/her







An Open Source guide on Data Science.

We involve and supports a diverse community to make data science reproducible, ethical, collaborative and inclusive for everyone.

# The Alan Turing Institute

The national institute for data science and artificial intelligence



#### **Tools, Practices and Systems**

- Trustworthy systems
- Transparent reporting
- Inclusive interoperable design
- Ethical integrity
- Respectful co-creation
- Leadership in open research



#### The Turing Way Book on Reproducibility



Kirstie Whitaker
Lead of Tools, Practices
& Systems Programme

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.

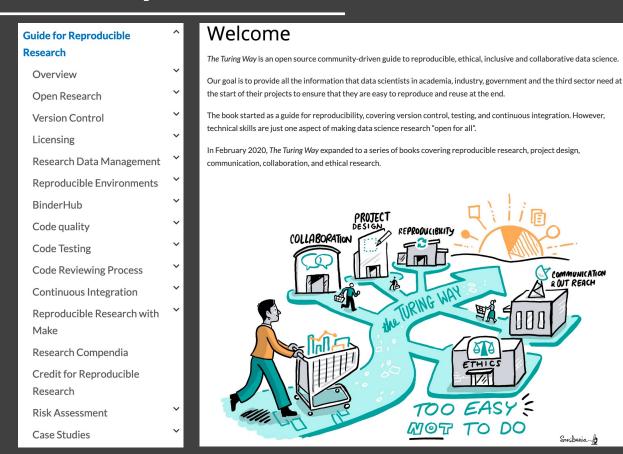
This also means making sure PhD students, postdocs, Pls, and funding teams know which parts of the "responsibility of reproducibility" they can affect, and what they should do to nudge data science to being more efficient, effective, and understandable.



#### Reproducibility

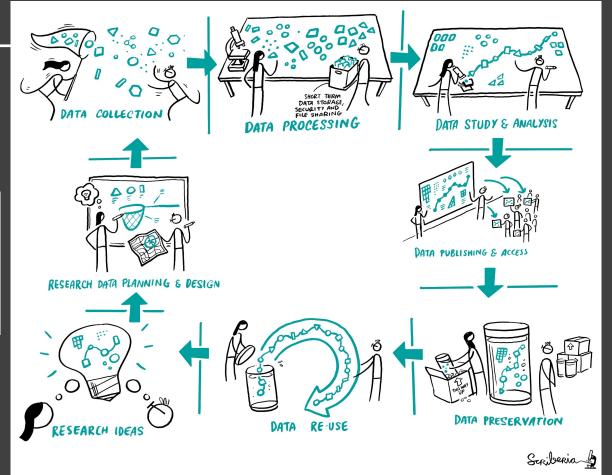
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alysis	Same	Reproducible	Replicable								
Ana	Different	Robust	Generalisable								

#### **Guide for Reproducible Research**



#### Reproducibility

		Data								
		Same	Different							
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## The Turing Way Guides



Reproducibility



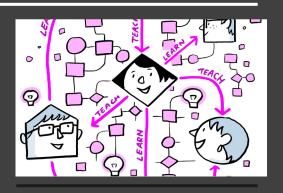
Collaboration



Project Design



Ethical Research



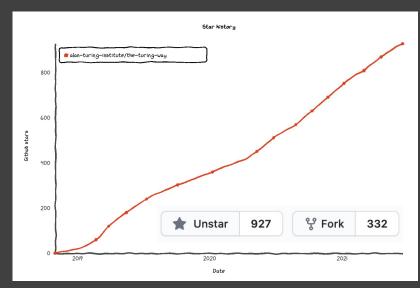
Communication



Community Handbook

### **Project and Community Growth**

- 2.5 years, >170 pages
- Community resources, events, guidance, templates, training
- 275 direct GitHub contributors and thousands of users



https://zenodo.org/record/3332807











#### **Overview of Project Design**

Planning for Project Design

Communication and

Collaboration

Reproducibility Methods

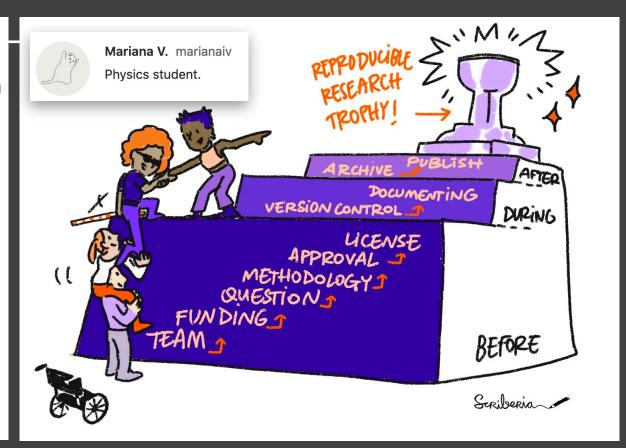
Version Control and

Documentation

**Sharing Your Research** 

Work

**Creating Project Repositories** 

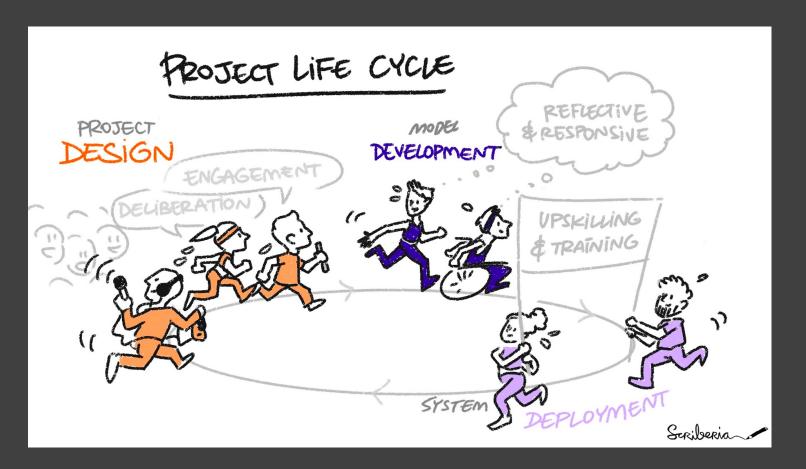


# The Alan Turing Institute

# **Ethical Research**

Researchers in data science have an obligation to consider the ethical standards and their impact of people's lives.





CC-BY 4.0, https://the-turing-way.netlify.app/ethical-research/ethical-research.html, DOI: 10.5281/zenodo.5083747 Christopher Burr | Automating Ethics. (2021, February 19https://chrisdburr.github.io/blog/automating-ethics/automating-ethics/

Guide for Ethical Research

Introduction to Research Ethics

Research Ethics Committees

Workflows

Ethical Decisions in Preclinical

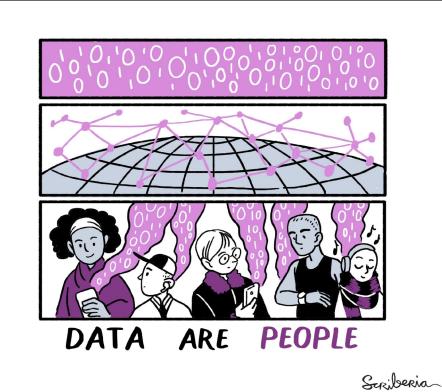
Research

Law, Policy and Human Rights

in Ethics

Activism for Researchers

Internal Policy Advocacy



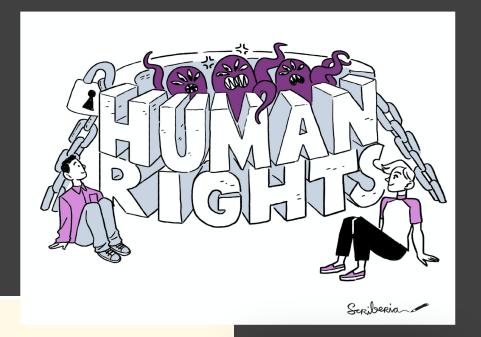
Core contributors: Laura Carter, Ismael Kherroubi-Garcia, Arielle Bennett, Laura Acion

# Areas of ethical concerns:

- 1. Project description
- 2. Data & Methodology
- 3. Consent
- Privacy & Security
- 5. Societal Consequences



Researchers and data scientists should ensure that they respect, protect, and fulfil human rights.



4 Attention

This is not legal advice. Please read for information only!

LauraCarter

Read the legal-disclaimer for why you should not use The Turing Way for legal advice.







ENGAGING WITH YOUR UNION.



The questions we ask, the analysis we conduct the patterns are heavily influenced by the lenses by which we view the world.

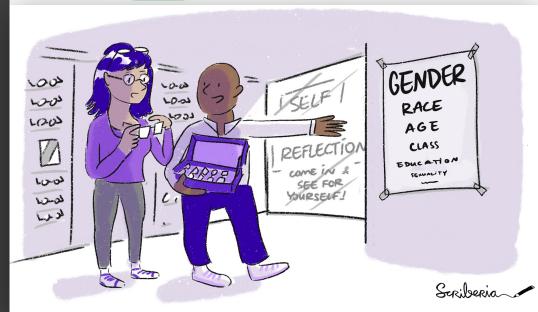
Draft by Nina Di Cara



# [WIP] Self-reflection prompts on ethical research practice #1919



ninadicara opened this issue on 18 May · 3 comments



The Turing Way GitHub issue: https://github.com/alan-turing-institute/the-turing-way/issues/1919, Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. Ricker, B. (2017, February 04). Reflexivity, Positionality and Rigor in the Context of Big Data Research.

#### [INVITATION] Data Feminism meets \_The Turing Way\_#1205



malvikasharan opened this issue on 10 Jun 2020 · 5 comments



malvikasharan commented on 10 Jun 2020 • edited -

"Data Feminism" has not only shed light on imbalanced power structures underlying data science but also started a timely discussion around research ethics.



### The Turing Way Community Framework

We avoid individual authorship in favour of establishing shared ownership and agency in this project. The project belongs to the community and is always a 'work in progress'.



CC-BY 4.0, https://the-turing-way.netlify.app/community-handbook/community-handbook.html, DOI: 10.5281/zenodo.5083747 Kelly, Anthony, "With Head, Heart and Hand: Dimensions of Community Building" (Boolarong Press) ISBN 978-0-86439-076-9

Open leadership is a set of practices and skills people can use and build projects that allows them to collaborate within inclusive communities.

# Design for Collaboration



#### **Understanding**

Your work is clear, authentic and widely accessible

# Design for Collaboration



**Understanding** 



Sharing

Your work can be adapted, reproduced, and built upon

# Design for Collaboration





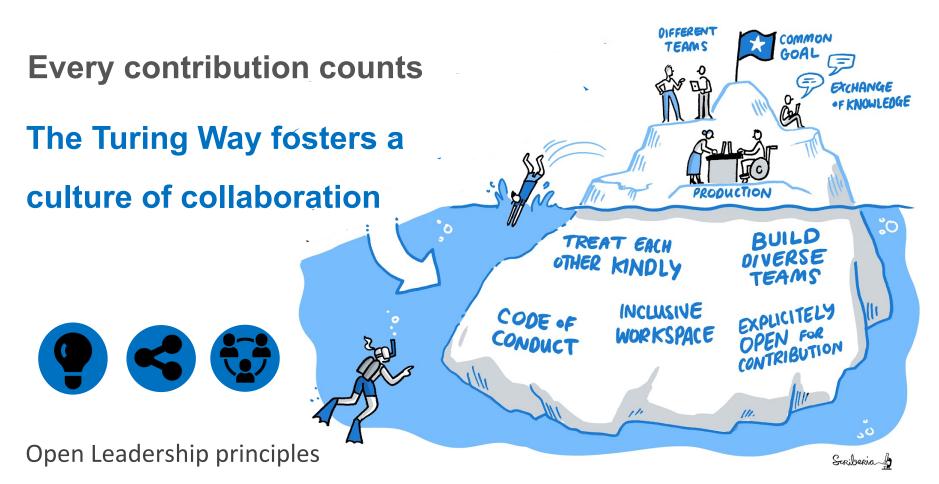


**Sharing** 



Participation & Inclusion

Creates a shared ownership that inspires contributions



#### **Building an Open and Collaborative Community**

#### Open is by default not:

- Inclusive
- Accessible
- Community-led

Intentional designing



# Pathways for Collaboration



Develop & share



Review and update



Maintain & improve



Make it global

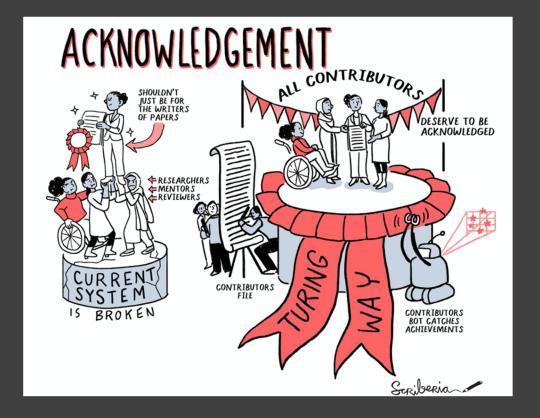


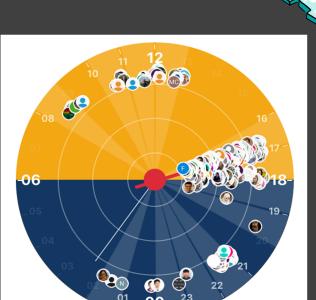
Share resources



Share best practices

#### A community-oriented collaborative book





Community members from Slack in different time zones

# WILLIAM PARTY OF THE PARTY OF T

#### **Book:**

the-turing-way.netlify.app/

#### **GitHub:**

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

#### Twitter:

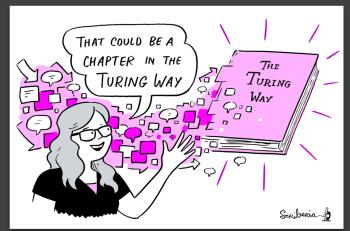
twitter.com/turingway

#### **Email:**

theturingway@gmail.com

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#### A Book with Five guides



#### A Community



#### An Open Source Project



#### A Culture of Collaboration



# Notable Impacts Beyond the project

Resources are being used by learners, educators, community builders, policy makers and researchers globally

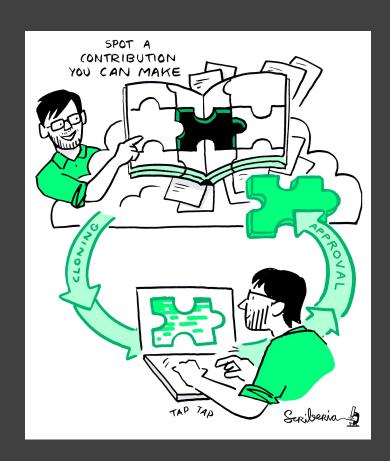
- Reproducibility of scientific results in the EU 2020 (report)
- An Emerging Technology Charter by Mayor of London (policy)
- Innovation Scholars: UKRI grant 2020 (funding)
- CodeRefinary and Library Carpentries (training materials)
- Projects by data scientists including at the Office for National Statistics
- Cited by 10+ peer-reviewed articles & 10+ open source projects

Adina Wagner	Aditi Shenvi	Albert Hornos Vidal	Alex Bird	Alex Chan	Alex Clarke	Alexander Morley	Charlotte Watson	Chris Holdgraf	Chris Marklewicz	Christina Hitrova	Christopher Lovell	Clare Liggins	Colin Sauze	Georgia Atkinson	Georgia Tomova	Georgiana Elena	Gertjan van den Burg	Gianni Scolaro	Graham Lee	Greg Klar	Stefan Janssen	Stefan Verhoeven	Stephan Druskat	Stephen Eglen
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Carlos Martinez	Carlos Vladimiro González Zelaya	Cassandra Gould			Chandler Klein	100	Federico Nanni	Ferran Gonzalez Hernandez				Fuad Reza Pahlevi		Joshua Teves	José María Fernández		Katherine Dixey			Kevin Kunzmann	Stephen Eglen	Sumera	cecilodebezenac	daniguariso
Kim De Ruyck	Klim De Ruyck	Kirstie Whitaker	Kristijan Armeni	Krunal Rank	Lachlan Mason	Laura Acion	Naomi Penfold	Natacha Chenevoy	Natalie Thuriby	Nathan Begbie	Neha Moopen	Neil Chue Hong	Nick Barlow	Rachael Ainsworth	Radka Jersakova	Raniere Silva	Reina Camacho Toro	Remi Gau	Reshama Shaikh	Richard Gilham	Tim Head	Tim Powell	Sansone  Tony Yang	Swalko Al
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#### Meeting you where you are!

- i. Join the community
- ii. Learn a new skill
- iii. Share your skills
- iv. Collaborate with others
- v. Mentor others' contributions
- vi. Represent this community

We value your participation!



#### Join a Community Event

- Collaboration Cafes
  - 1st & 3rd Wednesdays (14:00 UTC)
- Coworking Calls
  - Mondays (10:00 UTC)
- Onboarding Calls
  - Fridays (17:00 UTC)
- More ways to connect

# bit.ly/turingway







- Community Manager, Al for Science and Government
- Senior Community Manager, Early Detection of Neurodegenerative diseases
- Community Manager, Turing Roche Partnership
- More opportunities will be announced

bit.ly/turingway



# A mentoring & training program for Open Science Ambassadors Special call under: OLS-4 for Turing

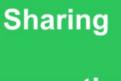
**Application period** 



Cohort announcement

mid-August 2021

**OLS-4 Timeline** 



Connecting

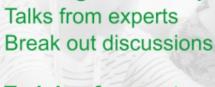
**Empowering** 



Email: team@openlifesci.org

@openlifesci @turingway

1:1 mentoring Training calls on Open Science





**OLS-3 period: February to May 2021** Apply individually or in team to join the cohort

Visit our website: openlifesci.org

Training for mentors

**OLS-4 Cohort begins** mid-September 2021

**OLS-4 Cohort ends** January 2022

#### The Alan Turing Institute

#### **Acknowledgements:**

- Kirstie Whitaker, Whitaker Team Members
- The Turing Way community, friends & collaborators
- Book: the-turing-way.netlify.com
- Twitter: twitter.com/turingway
- Newsletter: <u>tinyletter.com/TuringWay</u>
- Chat: gitter.im/alan-turing-institute/the-turing-way
- GitHub: github.com/alan-turing-institute/the-turing-way
- Original artwork by Scriberia: <a href="https://doi.org/10.5281/zenodo.3332807">https://doi.org/10.5281/zenodo.3332807</a>

