

Investing in Research Infrastructure Roles for Culture Change

Malvika Sharan, Pronouns: She/her



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The Alan Turing Institute

Investing in Research Infrastructure Roles for Culture Change

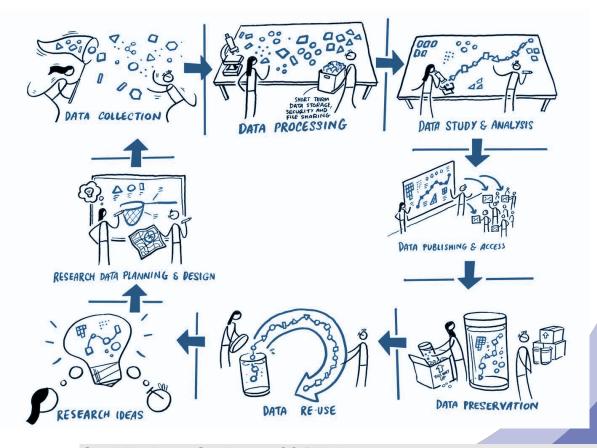
Malvika Sharan

Senior Researcher - Open Research Tools, Practices and Systems Programme



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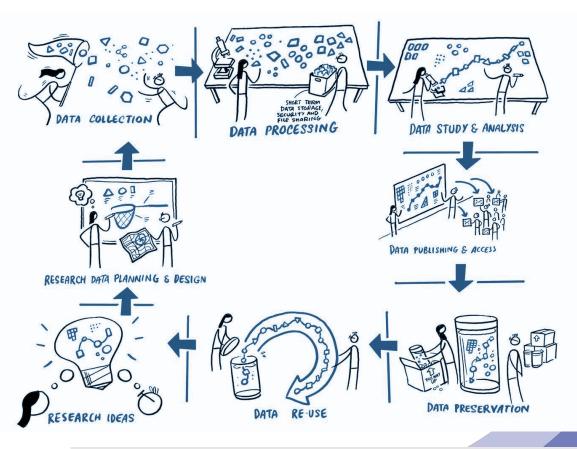
Research Life Cycle



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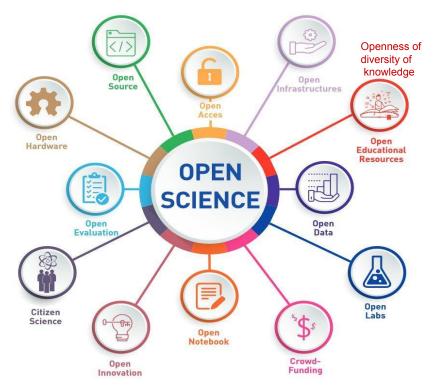
Research Life Cycle

- Researcher(s)
- Project supervisor
- Data Scientist
- Research Engineer
- Peer reviewers
- Data manager
- Project manager
- ...



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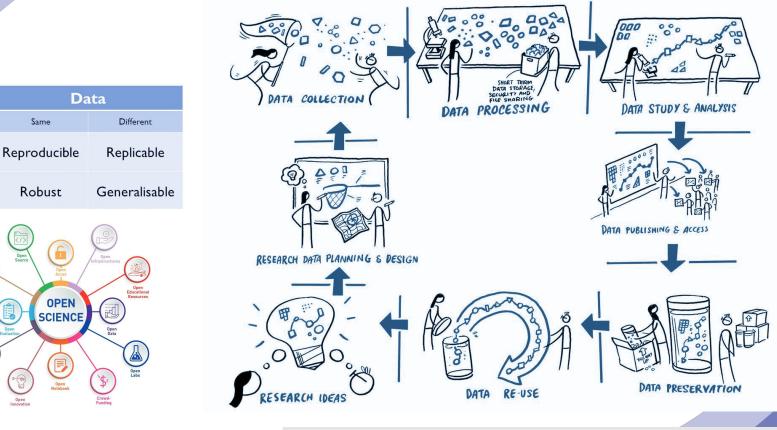
Integrating Open Science and Reproducibility



		Da	ita
		Same	Different
alysis	Same	Reproducible	Replicable
Ana	Different	Robust	Generalisable

Toward a UNESCO Recommendation on Open Science: **Canadian Commission for UNESCO** By Ella Chan, Dick Bourgeois-Doyle, Michael Donaldson, and Eleanor Haine-Bennett, Ottawa, Canada, April 2020, UNESCO presentation of 17 Feb 2021 @malvikasharan @turingway, CC-BY 4.0, Zenodo: <u>https://doi.org/10.5281/zenodo.3332807</u>. Presentation DOI: 10.5281/zenodo.7620215

Research Life Cycle



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Same

Analysis

Same

Different

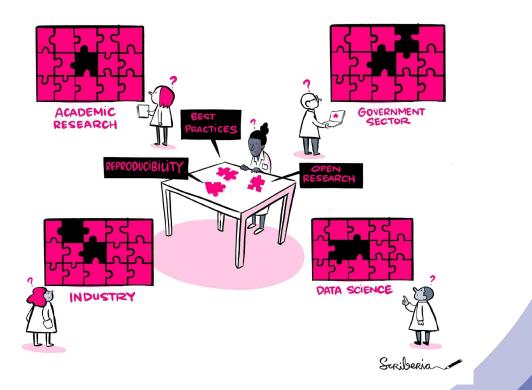
-Open Hardware

Citizen Science

Evolving Research and data Landscape

Data skills range from programming, data visualisation, analysis and database management, to core skills such as problem solving, project management and communication.

National Data Strategy, 2020



National Data Strategy - 2020. Gov.uk. Department for Digital, Culture, Media and Sport. <u>Skills: Data skills</u> for a data-driven economy and data-rich lives

Emergent Research Roles

- Project scoping
- Funding
- Project management
- Project supervision
- Reporting / publication
- Data & Digital Skills
- Peer review
- Research engineering
- Data management

- Stakeholder engagement
- Collaborative workflow
- Impact assessment
- Policy compliance
- Ethical considerations
- Adoption of outputs
- Govt./Public feedback
- Sharing 'Research Objects'
- Archiving and preservation

- Equitable & inclusive teams
- Maintenance
- Training and upskilling
- Community management
- Event facilitation
- Mentoring & career support
- Documentation
- UX/UI development
- Software auditing

UK Research and Development Roadmap: Attract, retain and develop the talented, diverse people and teams that are essential to delivering our vision.

Emergent Research Roles

(Open) Research skills should be incentivised fairly

Project scoping

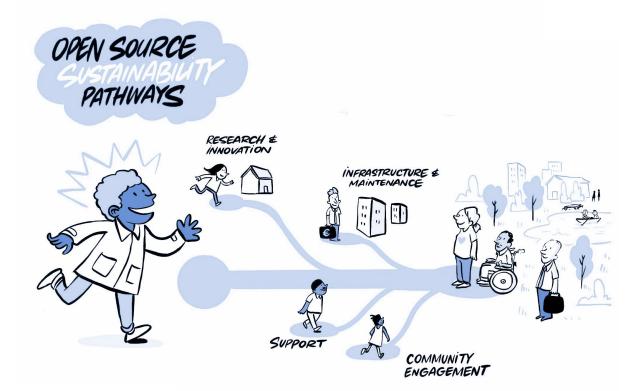
- Funding
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- Mentoring & career support
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- Software auditing

Contributors Roles taxonomy: CRediT, <u>credit.niso.org</u>. Careers in Research - London School of Economics: <u>https://info.lse.ac.uk/current-students/careers/</u>

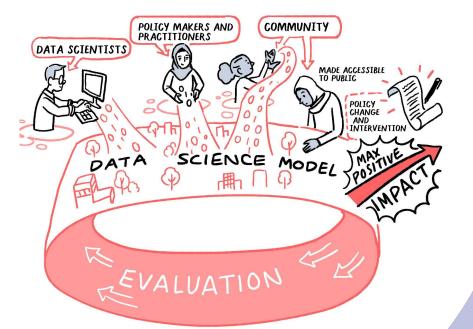
Research Infrastructure Roles



<u>UK Research and Development Roadmap</u>: Attract, retain and develop the talented, diverse people and teams. Ensure that our science, research and innovation system is responsive to our society

Research Infrastructure Roles

Research infrastructure roles provide **specialised skills**, **expertise and services** required for effectively carrying out **high-quality research**.

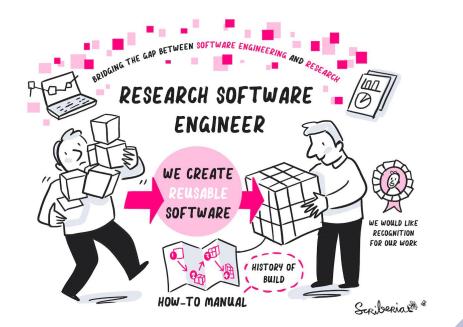


<u>UK Research and Development Roadmap</u>: Attract, retain and develop the talented, diverse people and teams. Ensure that our science, research and innovation system is responsive to our society

Diversifying Research Roles

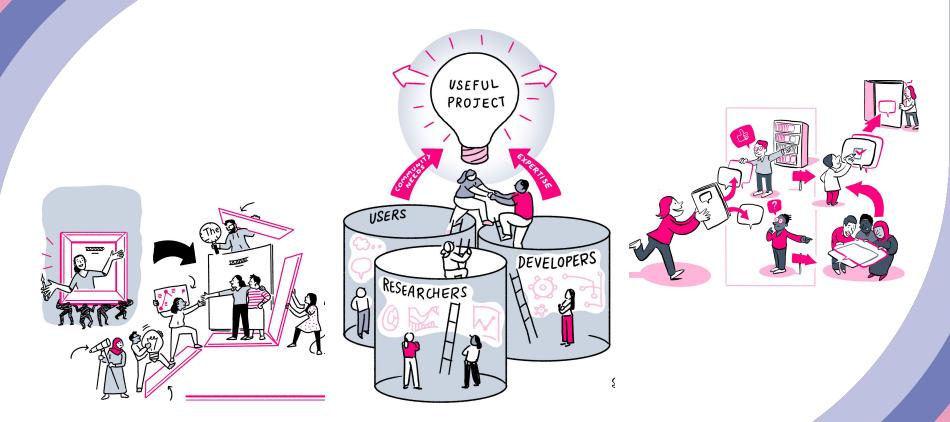


10 Years of the RSE movement



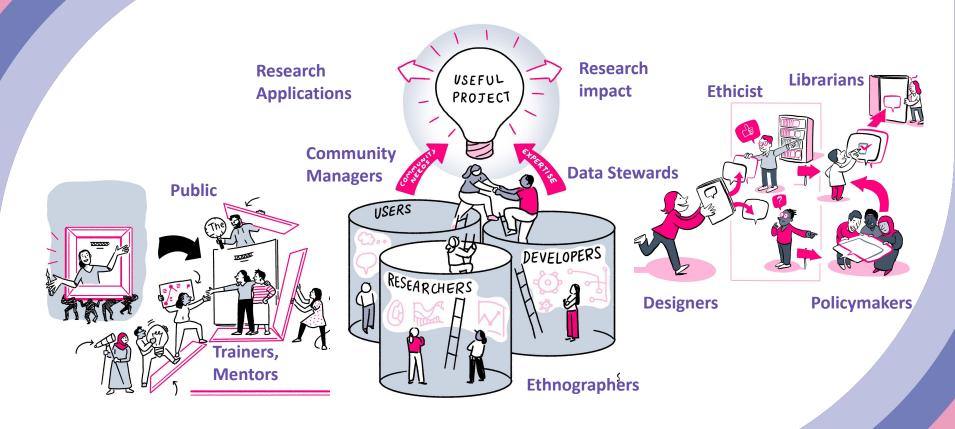
Baxter, R, Chue Hong, N, Gorissen, D, Hetherington, J & Todorov, I 2012, 'The Research Software Engineer', Digital Research 2012

Diversifying Research Roles



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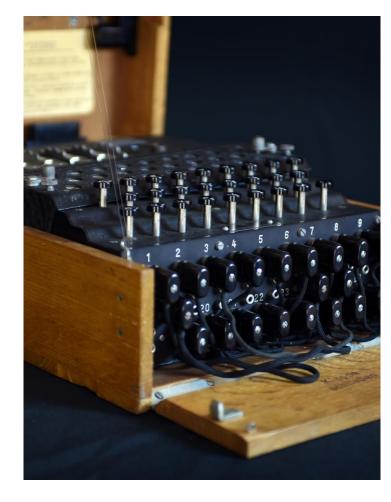
Diversifying Research Roles



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The Alan Turing Institute

The national institute for data science and artificial intelligence



The Alan Turing Institute, https://www.turing.ac.uk/, https://www.turing.ac.uk/news/enigma-machine-goes-display-alan-turing-institute

Tools, Practices and Systems

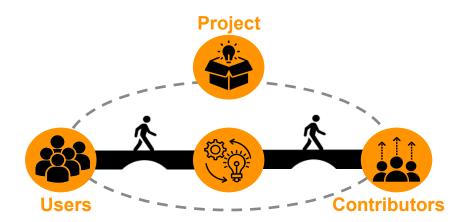
- Trustworthy systems
- Transparent reporting
- Inclusive interoperable design
- Ethical integrity
- Respectful co-creation
- Leadership in open research



https://www.turing.ac.uk/, Zenodo: https://doi.org/10.5281/zenodo.3332807. Presentation DOI: 10.5281/zenodo.7620215

Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts



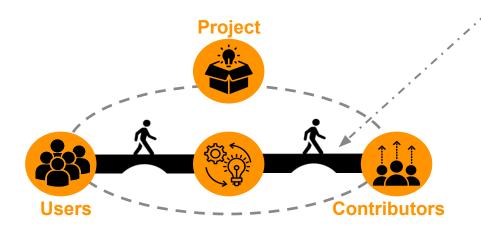
Strategic and technical support for Stakeholder Engagement and Participation

https://www.turing.ac.uk/, Zenodo: https://doi.org/10.5281/zenodo.3332807. Presentation DOI: 10.5281/zenodo.7620215

Research programmes Home + Research +

Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts



Strategic and technical support for Stakeholder **Engagement and Participation**

Community Management



Researchers and collaborators







Lee



Dr Emma Karoune

Dr Arron Anne Lacey

Vicky Hellon







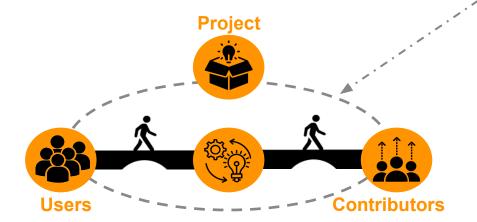
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https://www.turing.ac.uk/research/research-programmes/tools-practices-and-systems/community-management-and-open-research

Research programmes Home + Research +

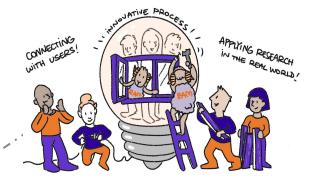
Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts



Strategic and technical support for Stakeholder **Engagement and Participation**

Research Applications



Seriberia -

Organisers







Dr Aida Mehonic



Dr Alden Conner

Jennifer Ding



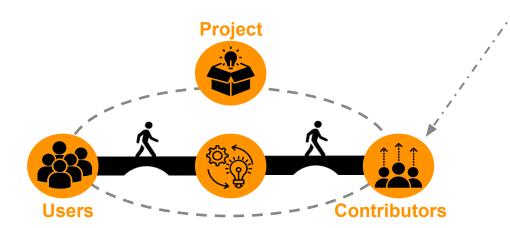
Hari Sood

https://www.turing.ac.uk/research/research-programmes/tools-practices-and-systems/research-application-management

Home + Research + Research programmes

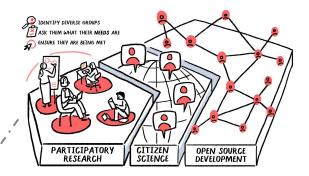
Tools, practices and systems

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Strategic and technical support for Stakeholder Engagement and Participation

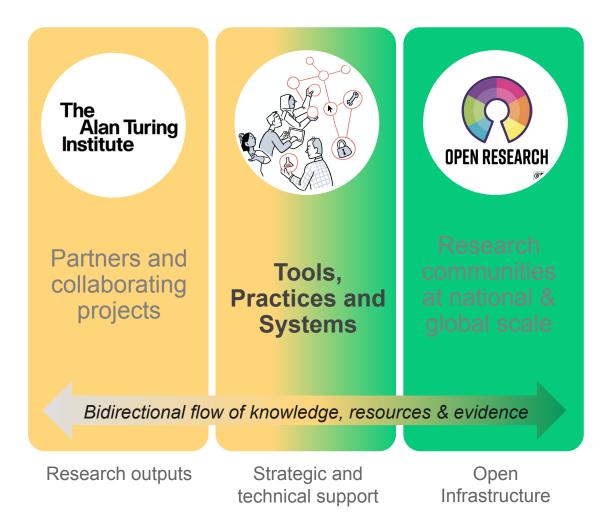
Participatory Citizen Science





Bastian Greshake-Tzovaras Senior Researcher, Co-lead of Autspaces, Co-director of Open Humans Platform, Co-Pl of Transbiome Project

https://www.turing.ac.uk/research/research-projects/citizen-science-platform-autistica





The Turing Way

A community-led handbook to best practices in Data Science.

We involve and support a **diverse community** to make research **reproducible, ethical, and collaborative** for everyone.



The Turing Way: Book on Reproducibility

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.



		Da	ata
		Same	Different
Analysis	Same	Reproducible	Replicable
Ana	Different	Robust	Generalisable

Guide for Reproducible Research	^
Overview	~
Open Research	~
Version Control	~
Licensing	~
Research Data Management	~
Reproducible Environments	~
BinderHub	~
Code quality	~
Code Testing	~
Code Reviewing Process	~
Reusable Code	~
Continuous Integration (CI)	~
Reproducible Research with Make	~





Fig. 3 The Turing Way project illustration by Scriberia. Used under a CC-BY 4.0 licence. DOI: 10.5281/zenodo.3332807.

@malvikasharan @turingway, CC-BY 4.0, Book: https://the-turing-way.netlify.app/welcome,

The Turing Way Q Search this book... Welcome Guide for Reproducible Research Guide for Project Design Guide for Communication Guide for Collaboration Guide for Ethical Research Community Handbook

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Research Infrastructure Roles 🔥

Community Managers Overview

Data Stewards Overview

Data Steward Personal Story

Data Wrangler Overview

Research Software Engineers Overview

Research Software Engineering Personal Story

Research Application Manager Overview

Research Infrastructure

Developer Overview

Remote Collaboration

Shared Ownership in Open Source Projects

Guide for Ethical Research

Community Handbook

Examples of Research Infrastructure Roles

This initial list of examples of Research Infrastructure Roles that has been expanded as part of *The Turing Way* Hackathon Workshop at the Big Team Science conference 2022.

- Community manager
- Project manager
- Research software engineer
- Research application manager
- Programme manager
- Data steward
- Data wrangler
- Research infrastructure developer
- Partnerships development manager
- Grant application manager
- Community engagement lead
- Librarian

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- Communications manager
- Events manager
- Participatory research manager



@malvikasharan, @turingway, https://the-turing-way.netlify.app/collaboration/research-infrastructure-roles.html,

Project Growth & Recognitions

- **4+ years, >260 Chapters**, community resources
- 425+ contributors, 3000+ monthly users supported by project leads, community manager, 20+ core members (governance)
- **Replication/extension** by 3 Turing & 6+ external projects (e.g. ONS, UCL, Uni Oxford, LIBER: Association of European Research Libraries)





@malvikasharan, https://star-history.t9t.io/#alan-turing-institute/the-turing-way, Presentation DOI: 10.5281/zenodo.7620215

Notable Activities & Impact

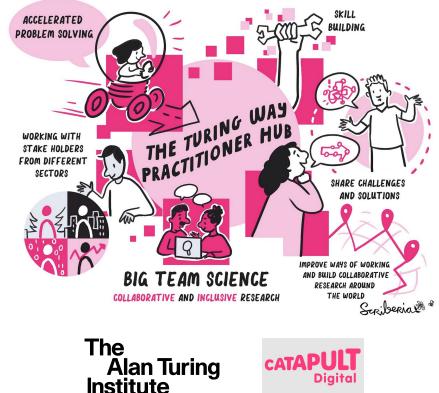
Resources used by organisations, research teams, educators, community builders, policy makers and researchers globally

- NASA Transform to Open Science 5 years Mission for capacity building
- Recommended in **Goldacre Review for modern open working** into health data
- NASA OpenCore, CodeRefinary, Library Carpentries training materials
- Reproducibility of scientific results in the EU 2020 report
- An Emerging Technology Charter by Mayor of London (2021 policy)
- Innovation Scholars: **UKRI grant 2020** (funding call)
- Cited by 30+ peer-reviewed articles & 100+ online publications

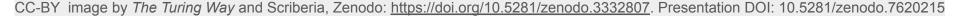
@malvikasharan @turingway, CC-BY 4.0, Zenodo: https://doi.org/10.5281/zenodo.3332807. Presentation DOI: 10.5281/zenodo.7620215

Broader Recognition for Research Infrastructure Roles

- The Turing Way Practitioners Hub in close collaboration with UK orgs (government, industry, public sector)
- The Turing's Skill Policy Award for engaging with policy ecosystem - led by Dr. Emma Karoune







Adina Wagner	Aditi Shenvi	Albert Hornos Vidal	Alex Bird ♥ ••	Alex Chan	Alex Clarke	Alexander Mortey	Charlotte Watson	Chris Holdgraf	Chris Markiewicz	Christina Hitrova	Christopher Lovell	Clare Liggins	Colin Saure	Georgia Atkinson	Georgia Tomova	Georgiana Elena	Gertjan van den Burg Lu 😜 💬	Gianni Scolaro	Graham Lee	Greg Klar III ••	Stefan Janssen	Stefan Verboeven	Stephan Druskat	Stephen Eglen
Ali Seyhun Saral	Andrea Pierré	Andrew Stewart	Andrian Nobella	Angelo Varlotta	Anna Hadjitofi Z 🏵 😧	Anna Krystalli © ? • • • • ?	Dan Hobley	Danbee Kim	Danlel Lintott	Daniel Mietchen	Daniel Nüst	Danny Garside	David Foster	Gustavo Becelli do Nacimento	Heidi Seibold	Hieu Hoang	Ian Hinder	Isil Bilgin	Ismael-KG	COMMINIAN ITS NIT FOR DEPYDOIT L JKasmire	Tarek Allam	Tess Gough	Thomas Sandmann	Tia Head © •
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The Turing Way Community Handbook

Community Handbook

Code of Conduct

Ways to Enter the Project

Style Guide

Maintaining Consistency

Chapter Templates and Contribution Workflow

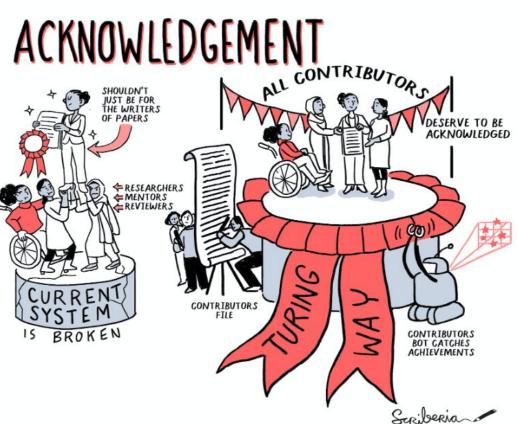
Acknowledging Contributors

Monthly Newsletters

Book Dash Events

Community Coworking Calls

Template Collection



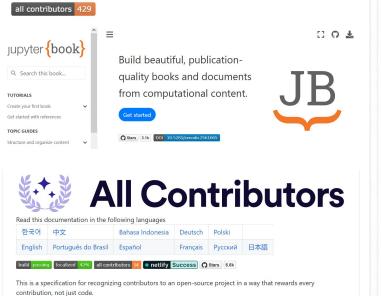
Online book: https://the-turing-way.netlify.app/community-handbook, @malvikasharan @turingway

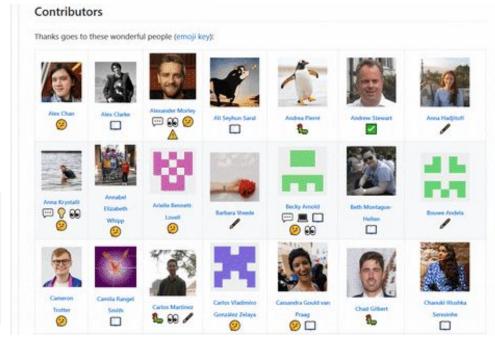
The Turing Way

This README.md file in also available in Dutch (README-Dutch), French (README-French.md), German (README-German.md), Indonesian (README-Indonesian), Italian (README-Italian), Korean (README-Korean), Portuguese (README-Portuguese), and Spanish (README-Spanish) (listed alphabetically).



Total Contributors:





Online book: https://the-turing-way.netlify.app/community-handbook, @malvikasharan @turingway

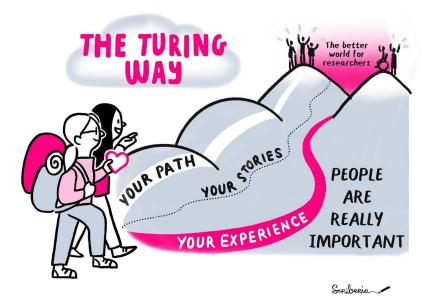
Join a Community Event

- Collaboration Cafes
 - 1st & 3rd Wednesdays (14:00 UTC)
- Coworking Calls
 - Mondays (10:00 UTC)
- Book Dash, Fireside Chats
 - Peridiocally
- More ways to connect
 - bit.ly/turingway



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!

The Turing Way Team at State of Open Con (3rd Floor)



Anne Lee Steele

Community Manager - The Turing Way The Alan Turing Institute





Emma Karoune

Senior Community Manager -Health Programme The Alan Turing Institute



bit.ly/turingway

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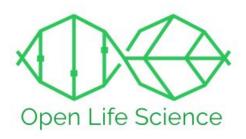
- Kirstie Whitaker, TPS Programme Director, TPS Team Members
- The Turing Way Team, Anne Lee Steele Community Manager
- The Turing Way Community, Collaborators & Contributors

Links:

- Book: the-turing-way.netlify.com
- Relevant resources: bit.ly/turingway
- Newsletter: tinyletter.com/TuringWay
- GitHub: github.com/alan-turing-institute/the-turing-way
- Original artwork by Scriberia: https://doi.org/10.5281/zenodo.3332807



The Alan Turing Institute



A mentoring & training program for Open Science Ambassadors in Life Science





Malvika Sharan @malvikasharan





Sharing

Connecting

Empowering

Join the program

openlifesci



1:1 mentoring



Training calls on Open Science Talks from experts Break out discussions



Training for mentors

OLS-8 applications open in June Apply individually or in a team to join the cohort

Visit our website: openlifesci.org



National Aeronautics and Space Administration



Dr. Chelle Gentemann, Science Lead Yvonne Ivey, Equity Lead Cyndi Hall, Community Coordinator Isabella Martinez, Content Coordinator Dr. Yaitza Luna-Cruz, CSDO Program Scientist Dr. Paige Martin, TOPS Program Scientist Dr. Sam Gabre, ARS, Science Advisor Dr. Ryan McGranaghan, GSFC, Science Advisor

Kevin Murphy, Chief Science Data Officer SMD Katie Baynes, Deputy Chief Science Data Officer SMD Dr. Steve Crawford, Science Data Officer SMD Amy (Uyen) Truong, Chief Science Data Office Coordinator



YEAR OF OPEN SCIENCE

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DOE + GSA + NEH + NIH +
NIST + USDA + USGS +





https://doi.org/10.5281/zenodo.7554804



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