Open science for enabling reproducible, ethical and collaborative research: *Insights from The Turing Way* (Southampton 2022)

	[Malvika] I would like to invite you to imagine a shared space that felt safe, inclusive and collaborative. Take a moment to recall - what kind of experience did that create for you? Places that build a sense of belonging through inclusion and collaboration, allows us to exchange ideas, be inspired and contribute to creating positive experiences. Places that are not not designed for participation - don't create shared experiences. In rural and indigenous communities Common lands are places for such shared experiences. For centuries, lands all over the world were managed and accessed by local communities. These included grazing grounds, forest land, ponds, rivers, and other areas that all members of a community can access and use.
	[Malvika] These are known as 'Commons'. A word that invokes a sense of community, shared ownership, experience and responsibilities, all at the same time.
	[Malvika] In India, Commons make up more than a third of India's total land area. They provide food, water, fodder, firewood, and livelihoods to rural populations, particularly the poor and marginalised communities, while also helping recharge land, groundwater and maintain the ecological balance. After India's independence from the British ruling, as the population grew and demand for land rose, rights to many common lands were taken away by the government, and given to private industrial and development projects, including roads, mines, power plants, and urbanisation

efforts, most of which were largely extractive and disrespectful of local needs. The arguments stemmed from colonial mentality that villagers and indigenous culture are inherently inferior and hence not capable of managing their lands or governing their own resources.

Modern laws undermine local knowledge, even though scientific studies give evidence that for centuries indigenous communities have strong arrangements for managing natural resources sustainably.

This picture is by the FES, they work with local communities in India to align modern law and technology with local knowledge, needs and ways of working. Through collective efforts, many rural communities have managed to reclaim their rights to commons while restoring community resources, in a way that directly addresses local needs, and build equality in society, especially among different actors of this shared space.

Participatory processes to manage the Com...

https://www.in-common.co.uk/2021/06/09/our-wonderful-southampton-common/

@malvikasharan, @ekaroune, @turingway, CC-BY 4.0, Zenodo: https://z...

[Emma]

In the UK, local green areas within cities and towns are known as commons.

Participatory processes to manage the Commons for shared benefit is called commoning. Although Commoning stems from the traditional commons in rural settings, it extends to urban spaces and beyond.

These are pictures from the 365 acre Southampton Common that was designated Common Land in 1228, and this allowed households within the borough to use the land for grazing, fuel, clay, and taking berries and other wild, natural food.
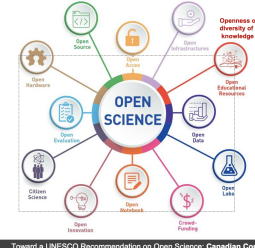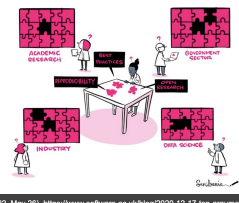
Most recently, Southampton common was integral for creating positive experiences during the pandemic lockdown by providing shared space for daily exercise and meeting friends and family safely outdoors.

This land has been threatened several times, but True to the spirit of Commons, local residents through commoning have consistently come together and preserve this space.

For instance in 1968 when the council wanted to construct car parks on the common – this was challenged and won in the High Court by Edward Chalk of the Southampton Commons and Parks Protection Society. The Southampton Commons and Parks Protection Society brings together a cross section of citizens committed to the well-being of

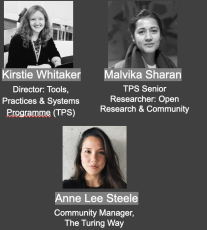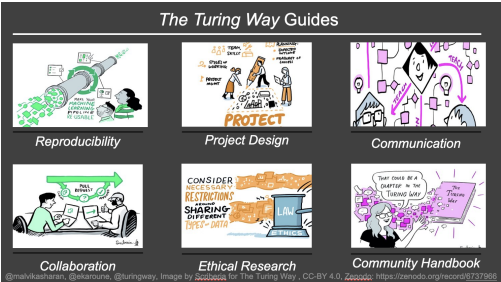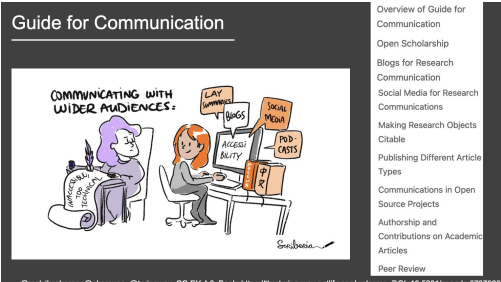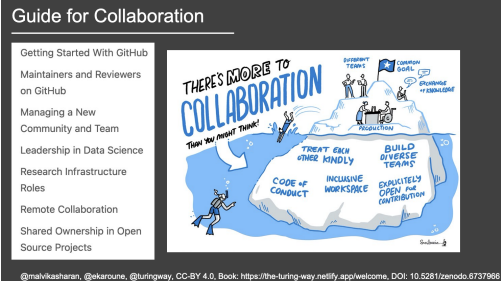|	Southampton City's green public spaces.
Governing the Commons: Elinor Ostrom Extensively researched commu[...] provided principles for how co[...] be governed equitably and sus[...] debunking "Tragedy of the Co[...] 2009 Nobel Laureate (1933-2012) Ostrom, E. (1990). Governing the Commons: The Evolution of Institutions for Collective Action. Cambr[...] 10.1017/CBO9780511807763, | Kenneth, J. A., Robert, O. K., & Simon, A. L. (2012). Elinor Ostrom: An [...] commons. PNAS, 109(33), 13135–13136. doi: 1	[Emma] Elinor Ostrom, a scholar and author of Governing the Commons - extensively researched communities and provided a set principles for how commons can be governed equitably and sustainably. Her work demonstrated that ordinary people around the world at the local level can often manage natural resources better than governments or private companies. They are closer to the problem, they work in shared interest and have local knowledge of how to care for their resources in the long term. She challenged and debunked "Tragedy of the Commons", which was often used to justify that privatisation, closed access and denying open participation are the effective methods to prevent resources from being ruined or depleted. Her work has been used in understanding and decolonising practices used in both rural and modern settings, as well as designing digital commons via online research communities and open science.
Collective benefits **Digital Commons** include free and open source software, open access journals, community-led projects and platforms – part of **Open Science**. DECISION MAK[...] GOVERNA[...] digital commons | David Bollier. Retrieved from http://www.bollier.org/categ[...] @malvikasharan, @ekaroune, @turingway, Image by Scriberia for The Turing Way , CC-BY 4.0, Zenodo: https://	[Malvika] Digital Commons builds on the practices learned from common spaces. Digital commons include free and open source software, open access journals, community-led projects and platforms – these are all part of Open Science practices and collaborative ways of working. In digital spaces, our experiences as a stakeholder in research are shaped by both our local and global realities. Hence, think about open science as a practice of commoning in digital space. You must ask similar questions as that of commons like who gets to participate in that space, what culture is represented, whose research is advanced and promoted, who gets to access different infrastructure and resources – and therefore build on existing knowledge or benefit their communities.

[Malvika]

Open science in digital commons integrates social justice and demands us to draw from our experiences in physical spaces to define openness, accessibility and collaboration in online spaces for us as individuals and communities.

People all around the world want to be involved in discussions relating research and scientific development, but not everyone has the right avenue to do that. Open science allows us to bring diverse voices representing situated knowledge and contextual realities to help build equitable and collaborative research. This process is particularly important to ensure participation of members from underrepresented and marginalised groups in participatory decision making for the collective benefit of a society.

[Malvika]

To define for everyone, Open Science is a way of conducting research where everyone can access, reuse, reproduce, build upon and distribute resources freely, without any barrier. Although the success of open science can be seen through the outcomes, more importance should be placed in the communities built by diverse participants who share common values and interests, and share knowledge and expertise for mutual benefit.

[Malvika]

Open Science Communities use open science framework for collaboration, peer-production and sustainability of research objects that are beneficial for them.

Aim is to ensure active participation in the development and *decision-making process* of research they use.

This means that diverse contributors are given opportunities to come into the project with different perspectives, participate in the development process and integrate their combined values in the product by-design.

UNESCO regards science as a human right -- the greatest collective endeavour -- that has significant value as a common good.

[Malvika]

Open science is an umbrella term used to talk about multiple concepts and streams of practices (like software, data, publications, education and processes).

Open science communities are developed around one or combinations of these streams where each community builds and cares for resources that are meaningful for them based on their contexts.

UNESCO regards science as a human right-- "the greatest collective endeavour"--and an enterprise that has significant value as "a common good".

UNESCO regards science as a human right -- the greatest collective endeavour -- that has significant value as a common good.

… aims to turn right to Open Science into duty to be exercised by researchers, institutions, educators, publishers, employers, libraries, and policymakers, facilitated by Member States.

[Malvika]

In the 2017 recommendation, UNESCO aimed to turn the right to Open Science into a duty to be exercised by researchers, institutions, educators, publishers, employers, libraries, and policymakers, facilitated by Member States.

Participants in science includes everyone including government and public, as they are the beneficiaries.

Integrating open science

Open Science means different things in different contexts, and hence, there is no fixed "best practice".

Many barriers to openness.

[Malvika]

Ideally everyone would know how to apply open science practices – but as we saw, Open science means many things and best practices for different contexts look very different. Although we can draw from our lived experiences at grassroots level - top-down recommendations, guidelines and support should be provided to integrate open science practices across academia, industry and government sectors. Furthermore, unfortunately skills for open science are not widely or effectively taught. Researchers often struggle to share data, code and methods openly, important to allow others to investigate each component and combine them to reproduce the original research. Practices for open and reproducible research is a shared responsibility, everyone should know how they can apply them in their work at different stages of research.

The Turing Way — An Open Science and community lead guide on Data Science. *We involve and support a **diverse community** to make research **reproducible, ethical, and collaborative** for everyone.* @malvikasharan, @ekaroune, @turingway, Image by Scriberia for The Turing Way , CC-BY 4.0, Zenodo: zenodo.org/record/6737966	This is where The Turing Way comes in the picture, that Emma will introduce you to. [Emma] The Turing Way is a project that I am a core team member of and Malvika co-leads. The Turing Way is an open science, open collaboration and community driven handbook to data science. We involve and support a diverse community in making research *reproducible, ethical, open and inclusive* for everyone. To make our work truly beneficial and comprehensible for as many people as possible we collaborate with individuals and organisations with diverse skills, backgrounds, lived experiences and domain knowledge.
The Alan Turing Institute — The national institute for data science and artificial intelligence @malvikasharan, @ekaroune, @turingway, https://www.turing.ac.uk/, Zenodo: zenodo.org/record/6737966	[Emma] It is a part of the Alan Turing Institute, which is the National Institute for data science and artificial intelligence in the UK.
Challenges — Advance data science and artificial intelligence to… Revolutionise healthcare, Deliver safer, smarter engineering, Manage security in an insecure world, Shine a light on our economy, Make algorithmic systems fair, transparent, ethical, Design computers for the next generation of algorithms, Supercharge research in science and humanities, Foster government innovation @malvikasharan, @ekaroune, @turingway, https://www.turing.ac.uk/, Zenodo: zenodo.org/record/6737966	[Emma] At Turing, we believe data science and artificial intelligence will change the world. We aim to train the next generation of leaders, shape the public conversation, and push the boundaries of these sciences for the public good. The challenge areas include the application of data science and AI to health, engineering, security, economy, fair, transparent and ethical algorithms, digital humanities and government innovation. The Turing Way applies that crossing cutting view on all data practices. This means that we ensure that data practices are discussed and described in a way that they can be adopted across academia, government and industries – dealing with a wide variety of challenges and social considerations.

Tools, Practices and Systems
- Trustworthy systems
- Transparent reporting
- Inclusive interoperable design
- Ethical integrity
- Respectful co-creation
- Leadership in open research

Trust Transparency
Inclusivity Integrity
Respect Leadership

@malvikasharan, @ekaroune, @turingway, https://www.turing.ac.uk/research/research-programmes/tools-practices-and-systems

[Emma]

The tools, practices and systems programme is a cross-cutting research programme that hosts The Turing Way.

The core values of this program are to embed best practices across Turing research and teams, as well as deliver trustworthy systems, transparent reporting, inclusive interoperable design, ethical integrity, respectful co-creation, and leadership in open research.

The Turing Way sits across these goals and provides a central resource for good practices to all our researchers within the UK and internationally.

The Turing Way: Book on Reproducibility

Kirstie Whitaker
Director: Tools, Practices & Systems Programme (TPS)

"We need to share the responsibility for open and reproducible science. That – along with good collaboration, communication and ethics – should be seen as fundamental to the scientific method."

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.

OUR COMMUNITY

@malvikasharan, @ekaroune, @turingway, Image by Scriberia for The Turing Way , CC-BY 4.0, Zenodo: https://zenodo.org/record/6737966

[Emma]

The Turing way started as a book on reproducibility by Kirstie Whitaker.

Shared as a lightly opinionated guide, The Turing Way handbook provides reproducible tools and practices to help ensure that the researchers, funders, policymakers and all different stakeholders in research know what their responsibility of reproducibility is, where they can make an impact, and how they can make their work more efficient and understandable.

The Turing Way: Book on Reproducibility

Kirstie Whitaker
Director: Tools, Practices & Systems Programme (TPS)

Malvika Sharan
TPS Senior Researcher: Open Research & Community

Anne Lee Steele
Community Manager, 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.

OUR COMMUNITY

@malvikasharan, @ekaroune, @turingway, Image by Scriberia for The Turing Way , CC-BY 4.0, Zenodo: https://zenodo.org/record/6737966

[Emma]

Malvika started as a community manager in 2020, and now she co-leads this project.

Anne Lee Steele is our new community manager.

The project is supported and maintained by a core team of Turing TPS members, that includes me, as well as Core contributors from other organisations and volunteers from our community.

Reproducibility

		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable

@malvikasharan, @ekaroune, @turingway, CC-BY 4.0, Zenodo: https://zenodo.org/record/6737966

[Emma]

We define reproducibility as when the same analysis is applied to the same data, it should give the same result.

There are other concepts around reproducibility like replicability – when the same analysis is applied to different data or experiments in different conditions, then there is

robustness and generalisability as well.

However, reproducibility in computational analysis should be maintained as a minimum criteria to ensure quality and integrity of our research.

[Emma]

Reproducibility starts right when you have a research idea.

You want to communicate with others, plan and design your work.

Then you will describe your protocol and collect data sets.

Then, you start processing and wrangling your data, conducting your studies and analysis, publishing your data, and other research components so everybody can access it.

Then comes the archiving that can ensure that your data is reusable, meaning that someone else can go through this whole process of reproducing or building upon your work.

[Emma]

 The purpose of openness is to ensure scientific integrity, rigor and quality outcomes.

Although we may place huge importance on outcomes in academia, open science practices are integral throughout the research process to achieve those outcomes. Furthermore, Openness doesn't work in vacuum, it requires a combined approach that takes reproducibility, ethics, collaborative and inclusive approaches at all stages of research lifecycle.

These are together considered as the foundational skill set in The Turing Way.

[Emma]

The Turing Way project started with contributors who documented best practices, guidance and recommendations in chapters, describing various concepts and tools that can ensure the reproducibility aspects of data research.

These chapters include topics such as open research, version control, licensing, data management, code testing

and reviewing, continuous integration and so on.

However, these data practices were not enough, as research also includes the way we communicate our work with others, how we design our project, and how efficiently we collaborate with each other.

All these while ensuring the highest ethical standards and research integrity in our research.

[Emma]

In order to accommodate all these requirements in research and data science, the project expanded to include four more guides in addition to the guide for reproducible research: project design, communication, collaboration and ethical research.

To ensure that a project like The Turing Way can be reproduced across different communities, we also maintain the community handbook that compiles all the processes and community practices that could be reused by others.

[Emma]

Researchers should not only have a good understanding of data analysis techniques but also develop skills to communicate insights from their work in a clear, open, and accessible format that can help key stakeholders make meaningful decisions.

In the guide for Communication we cover topics related to effective communication in research.

[Emma]

In the guide to collaboration we discuss a range of topics including using GitHub for collaboration, maintenance and open reviewing.

We also describe how to start a new community, what leadership in data science includes, a variety of research infrastructure roles such as research engineering, data stewardship, community management, research librarian and so on.

We intensively provide a variety of guidance for effective remote and hybrid collaboration, and also discuss building shared ownership in open source.

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
Self-Reflection

ETHICAL RESEARCH

[Emma]

The guide to Ethical Research includes chapters introducing the main concepts, case study on working with institutional ethics boards, and ethics in preclinical research.

We don't see ethics as a static or one-off part of the research process.

Ethical research includes recognising where your data comes from, and the impact of collecting and using it in your work.

Therefore, we explore the relationship between ethics, law, policy and human rights, and discuss activism and internal policy advocacy as well.

Guide for Project Design

Overview of Project Design
Planning for Project Design
Communication and Collaboration
Reproducibility Methods
Version Control and Documentation
Sharing Your Research Work
Creating Project Repositories

[Emma]

And finally the guide for project design.

Before you dive into the community aspects, please note that: The Turing Way is not a book that you read from cover to cover – you simply should not.

We advise everyone to start with the tool, concept and method that they need now, in their current work.

Same goes for researchers looking to engage in the project through resource development – they can share skills and resources that they are currently using in their projects, a skill they recently learned, a challenge they experienced and learned how to solve, or a case study from their work.

A Book
A Community
An Open Source Project
A Culture of Collaboration

Book:
the-turing-way.netlify.app/
GitHub:
github.com/alan-turing-institute/the-turing-way
Twitter:
twitter.com/turingway
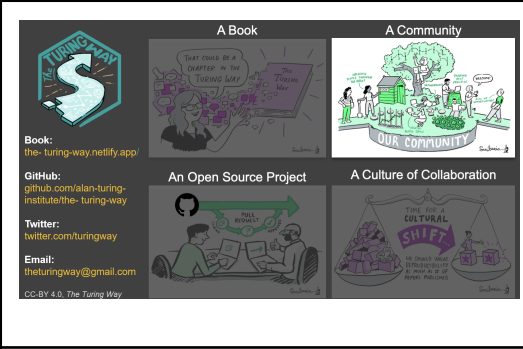Email:
theturingway@gmail.com

[Emma]

What I have so far talked about, described The Turing Way as a Book. But The Turing Way is more than a Book.

It is also a community where people come together to collaboratively write chapters, build and maintain resources, share their skills and ideas around best practices in data science and research.
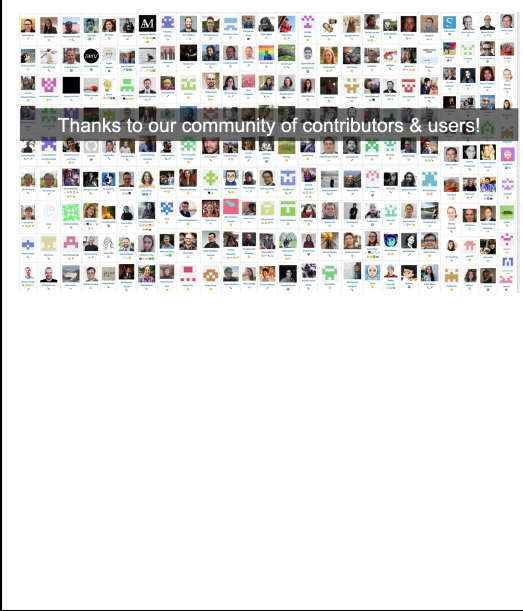
We apply open source principles in the development and maintenance of this project.

And finally, it's built on the culture of collaboration, which is the process and the backbone of our project.

[Emma]

Let's look at some aspects of our community

[Emma]

None of this work would be possible without our community of collaborators.

We'd like to invite you to become a contributor to the Turing Way, to help us develop chapters of data, transparent reporting, communication and other topics that can help others to stay updated with current practices. We welcome all kinds of contributions.
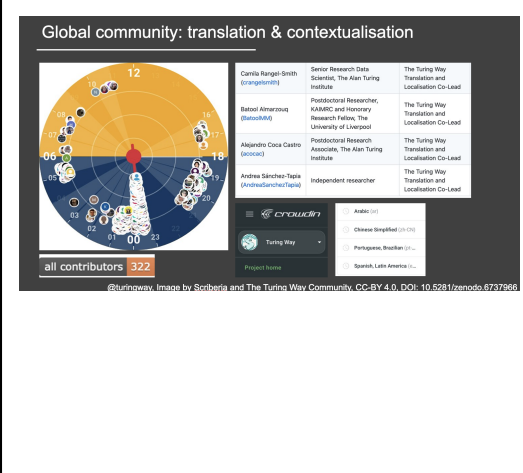
Case studies, and lived experiences, are welcome too. You don't need to have coding experience to contribute! You just need an idea and a willingness to learn.

[Emma]

The project is completely coordinated, developed and maintained via a public repository.

The minimum requirement for any repository, is adding a readme page, defining how people can contribute. and what is the code of conduct. In The Turing Way, we provide these documents as well as more. As a book, we use a documentation first approach. All reports, proposals as well as list of contributors' names are posted transparently. These are people who have contributed and would like to have their contributions documented.
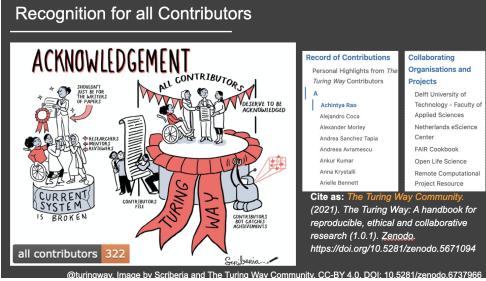

[Emma]

Our contributors come from around the world and they bring skills, challenges and resource requirements from their local communities.

We have a group of contributors who are translating the book into the language to make it truly global so more people can understand and learn from it. We currently have four languages where most of the developments are happening, which are Arabic, Spanish, Portuguese and

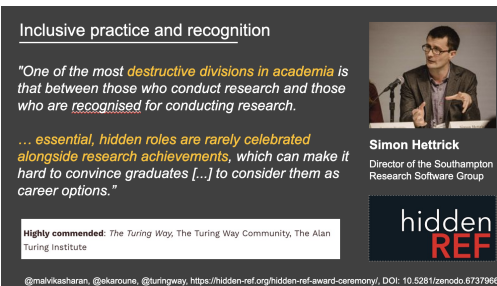|	
	Chinese.
	Four of our community members, Camila, Batool, Alejandro and Andrea are translation and localisation leads, they have set up infrastructure in crowdin to enable translation work.

[Emma]

We are committed to Creating equitable opportunities for community leadership without trying to fit The Turing Way into a traditional credit system.

The Turing Way team employs a decentralised process that avoids individual authorship in favour of establishing shared ownership and agency in the project. They ensure that all contributions are fairly acknowledged, especially when their roles involve hidden labour in research that are often undertaken by members from marginalised communities in research and tech spaces. The Turing Way book is attributed to The Turing Way community with each contributor listed as authors.

All our contributors can record their contributions beyond adding them to the contributors table using all-contributor bot. We provide a dedicated page in the book for contributors' record, that has dedicated links for all our contributors where they can highlight their personal work. They can share who they are, how people can learn more about them, and what kind of contributions they have made. They can write this in a way that's most meaningful for them.

Some of them would want to build a new skill, such as working with a version control system or community building. They can choose to work on a specific task that matches their interest. They can then update their page describing how they achieved these skills and build evidence that can become part of their CV.
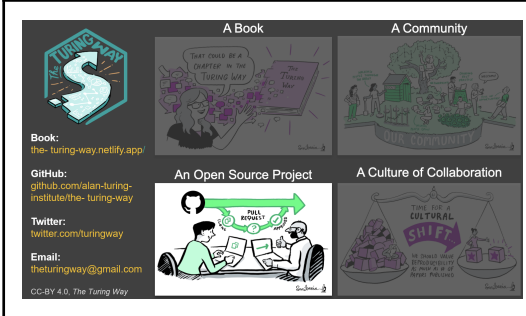

[Emma]

We want to highlight the Hidden Ref in their work to recognise the contributions of hidden research roles. This has been spear-headed by your very own Simon Hettrick.

The inclusive practice of giving credit beyond just the researchers, opens up the culture of research to enable future researchers to be involved in many different ways and in emerging open science roles such as community managers and research application managers.

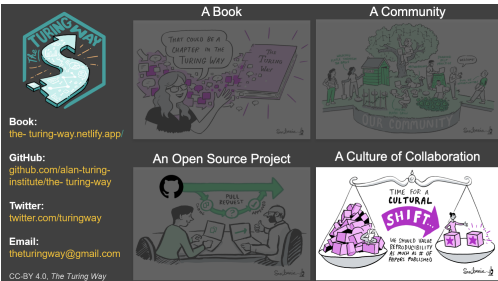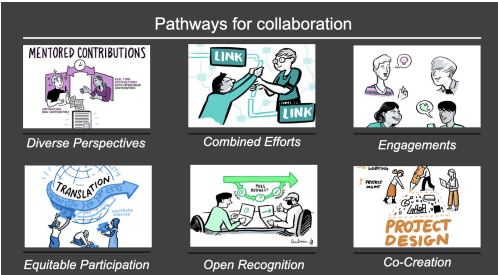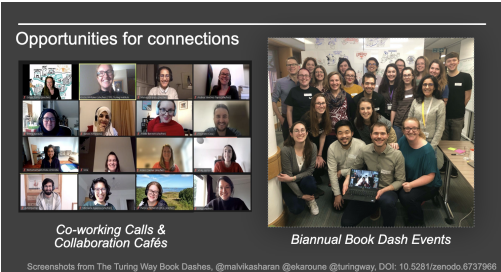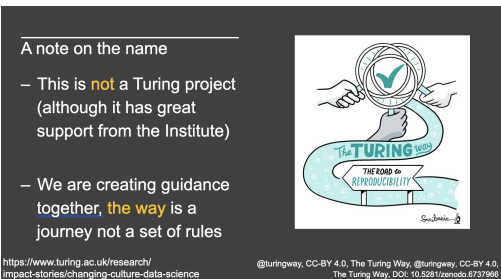|	
	Also recognising a wider range of outputs will benefit the movement to open research by making it more appealing to spend time focusing on quality and sustainability of research.
	Now I will pass it to Malvika, who will discuss the remaining two aspects of The Turing Way. [Malvika] Thanks Emma.
	[Malvika] The Turing Way has grown within a short amount of time because it has been designed to be open source. Meaning that "Everyone can freely read, reuse, distribute, modify and help develop." We have also made sure that the project belongs to the community and builds on existing open source projects like git, jupyter book, binder, hypthes.is for web annotation, bots for continuous integration and workflow.
	[Malvika] We have seen our project and community grow in the last three years. We currently host over 250 sub-chapters across five guides. In order to ensure that our community members are able to participate irrespective of their previous experience of working with the Open Source or data science community, we provide the resources, guidance, templates, training and pathways that they can use to stay involved in the community. We have over 325 direct contributors on GitHub, where we develop our resources and 1000s of users. For example, our illustrations, which I have intensively used in my talk, have been downloaded nearly 10000 times. We also maintain a social media presence and communicate about the project so that it can reach as many people as possible and we can bring new voices in. For a community that started at a grassroot level, we are very grateful to have these members working with us.

[Malvika]

Our moonshot goal is to make reproducibility too easy not to do. And that can happen when there are system and structure level changes by influencing research at the national and international levels, where inclusive practices and reproducibility are as important as a data and algorithm.

Resources are being used by learners, educators, community builders, policy makers and researchers globally. Some examples where The Turing way have been referenced include:

-Reproducibility of scientific results in the EU 2020 (report)

-An Emerging Technology Charter by Mayor of London (policy)

-Innovation Scholars: UKRI grant 2020 (funding call)

-CodeRefinary and Library Carpentries training materials

-Recommended in Goldacre Review for modern open working into health data

-Cited by 30+ peer-reviewed articles & 100+ online publications

[Malvika]

At the core of all we do is a consistent effort to support and foster a culture of collaboration

[Malvika]

We define different pathways for collaboration that goes beyond 'just writing' chapters.

We invite and engage people with different perspectives who participate in the development process and integrate their combined values in the project by-design. Our community members share practices, case studies, skills and even social change they want to see through The Turing Way. The kind of engagement they have in the project are inspired and affected by their observations, needs and resources available to them. Therefore, in all our work we strive to ensure that our community members have equitable access to participation, process to get

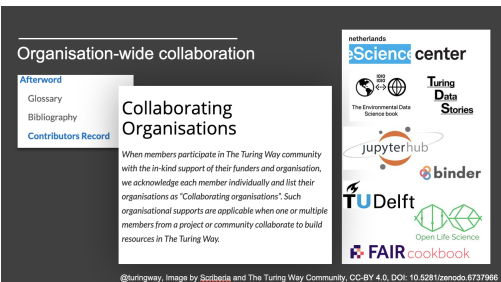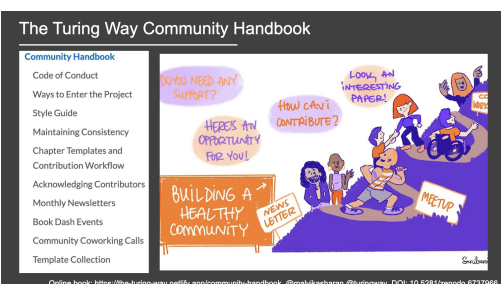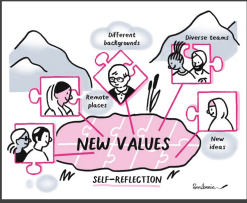|	recognised for all their work and opportunity to collaborate in guiding the direction of the project. We believe that through such a participatory process, we will be able to co create resources that are relatable, useful and beneficial to diverse users.
Opportunities for connections *Co-working Calls & Collaboration Cafés* *Biannual Book Dash Events* Screenshots from The Turing Way Book Dashes, @malvikasharan @ekaroune @turingway, DOI: 10.5281/zenodo.6737966	[Malvika] Since The Turing Way is an online and open source project, it is very important that we create opportunities for building connections. We host co-working calls every week and collaboration cafes bi-weekly. We also host book dash events – which is a hackathon-like event that brings people together to work synchronously. The virtual one ended up giving us more opportunities for connecting with people who couldn't have otherwise attended in person, making it a lot more inclusive and diverse in terms of the work that we did, the kind of conversation we had and the kind of ideas that developed together.
A note on the name – This is not a Turing project (although it has great support from the Institute) – We are creating guidance together, the way is a journey not a set of rules https://www.turing.ac.uk/research/impact-stories/changing-culture-data-science @turingway, CC-BY 4.0, The Turing Way, @turingway, CC-BY 4.0, The Turing Way, DOI: 10.5281/zenodo.6737966	[Malvika] A note on the name: This is not a Turing project (although it has great support from the Institute) We are creating guidance together, the way is a journey not a set of rules
Organisation-wide collaboration @turingway, Image by Scriberia and The Turing Way Community, CC-BY 4.0, DOI: 10.5281/zenodo.6737966	[Malvika] Members from many organisations collaborate with The Turing Way. Many of these contributors take on maintainers roles and help build interoperability between The Turing Way and their projects so that we don't reinvent what already exists and exchange resources that are needed in their communities.
The Turing Way Community Handbook Online book: https://the-turing-way.netlify.app/community-handbook, @malvikasharan @turingway, DOI: 10.5281/zenodo.6737966	[Malvika] All the community practices are described in The Community Handbook of the Turing Way book, that are open for remix and reuse by other communities who would like to reproduce or build on our work.

[Malvika]

Due to community engagement and collaboration that happens in open, we have also Evidence of successful replication or extension that include

●Quality Assurance of Code for Analysis and Research, Office for National Statistics , UK

●Turing Data Stories and The Environmental Data Science book, The Alan Turing Institute

●FAIR Cookbook by researchers at University of Oxford, Novartis, FAIRplus Consortia

●UCL Institute of Health Informatics Coding Club Handbook, University College London

●A Citizen Science Guide for Research Libraries, LIBER Citizen Science Working Group

[Malvika]

We have multiple community events and calls weekly and you are invited to join us.

I host collaboration cafes every month, and coworking calls each week. There is also an onboarding call for folks new to the project.

You can find details in the shared notes - bit.ly/turingway.

[Malvika]

The Turing Way team collaborates with different international communities to co-design and co-host Fireside Chat events that are online hosted informal discussions on topics of shared interests across research communities. Speakers are invited from diverse backgrounds and perspectives to present their views, contextualise the topics in their areas of work and catalyse cross-community collaborations through knowledge sharing.

It takes place on the 3rd or 4th week of each month.

What does open mean to You?

– Learning from the 'Commons'
– Purpose is to ensure scientific integrity and quality outcomes: The Turing Way
– Hidden labour, collaborative process, community practices
– Building open science skills with a global community

OPEN to the World
Everybody WINS
COLLABORATING NOT COMPETING

[Malvika]

This is a recap slide for what I have shared with you so far - although I am sure you already knew a lot of the concepts and practices already.

We talked about open science from different angles. We gave examples from the commons. Drawing from century old practices from indigenous communities, as well as more modern lives, we saw how the movement of commons, or commoning extends in digital commons that include open science products including software, data and infrastructure.

Although we are emphasising on open science practices, they exist and go hand in hand with reproducibility, ethics and collaboration in our research.

Purpose of openness is to ensure scientific integrity and quality outcomes, achieved by applying reproducible, ethical, collaborative and inclusive research practices.

We also discussed the rights and duty to open science because our research has real-world consequences.

And finally by sharing The Turing Way resources and our community practices, I talked about how we can exchange research best practices from our domains and develop skills as part of the global community.

This versatility should encourage you to question, what does open mean to you?

Reproducibility

– Is my work/code **correct**?
– Can others **read/test** it?
– Is my **workflow robust**?
– Have I provided **manual**?
– Is my work **citable**?

Open Science

– Is my code **freely available**?
– Can others **modify/share**?
– Is my **workflow reusable**?
– Have I given **permission**?
– Is my work **open for collab**?

[Malvika]

Open and reproducibility are not the same, but it is also important to understand how reproducibility and openness can be practiced side by side to address specific concerns and amplify the quality of our work.

For instance reproducibility practices involve asking if my work – as in research hypothesis, project design, tools, code, data etc. Correct. In addition open science allows us to address if each of them are freely available. Important to remind that, apply the principles of "as open as possible, as close as necessary" - meaning, when dealing with private and sensitive data, of course you should not share the data, but should be able to share other research components

allowing others to still evaluate your work.

Similarly, reproducibility will address if others can read and test your work – open science will address if other can modify and further share your work.
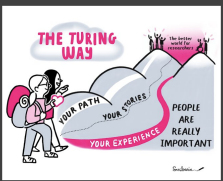
Then asking if the worflow is correct, have I provided guidance and if people can cite my work.

Complementing with the solutions for workflow reusability or transferability, appropriate permission and license and open collaboration.

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!

CC-BY image by The Turing Way & Scriberia, @malvikasharan @turingway, DOI: 10.5281/zenodo.6737966

[Malvika]

With that overview of open science and the Turing way, I'd like to invite you to use, contributor to and build on the Turing Way, You don't need to have coding experience to contribute! You just need an idea and a willingness to learn.

So, if you are new to the community, you can join us. You can learn a new skill or share your skills. You can collaborate with others and receive mentoring or mentor others' contributions. You can also represent this community. We welcome all kinds of contributions.

[Malvika]

I also want to plug Open Life Science, a non-profit organisation that trains and mentors researchers over a period of 16 weeks to apply open science in their project. I co-lead this project with Yo Yehudi, Berenice Batut and Emmy Tsang.

We have opened call for the 6th round of the programme where you can bring your own project, attend training and mentoring opportunities and apply open science practically in your work step by step.

Reimagining Openness

Open Science is not a radical approach, but a tool to learn, unlearn, challenge, dismantle and reimagine research infrastructure that prioritises equitable participation, co-creation and culture change.
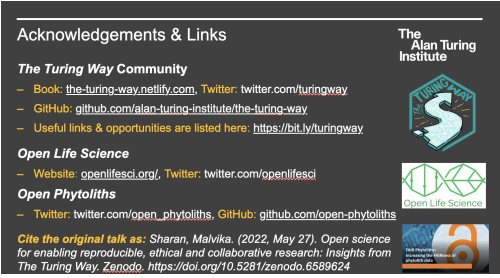
@malvikasharan @ekaroune @turingway, CC-BY 4.0, Book: https://the-turing-way.netlify.app/welcome, DOI: 10.5281/zenodo.6737966

[Malvika]

If there is one message you would like to take away from this talk, it should be to recognise Open Science as a way to transform the way we conduct our research through alternative approaches that emerge from cross-culture/cross-domain knowledge, rather than created by a dominant privileged group. Take one step at a time, there is no need to do everything at once.

Many facets of open science should not be taken as

restriction or distraction, but as scientific freedom. You can learn, unlearn, challenge, dismantle and rebuild research infrastructure that prioritises reproducible, ethical and collaborative research for collective benefit.

Through radical imagination let open science be your superpower.

[Malvika] With that we would like to thank everyone, especially Kirstie Whitaker for starting The Turing Way and our community members for transforming it t what it is.

Special thanks to Emma Karoune. It is a privilege to work with her and I am glad that she could join me today to give this talk for you all. Talking about the community without a strong community member like her would have seemed shallow. Furthermore, I am happy to share these links about the Open Phytoliths projects that she leads. So if you are an archaeologist or phytolith research, connect with her to join her project – beyond The Turing Way.

Thank you all for listening to us, and we are happy to take any question.