

**The
Alan Turing
Institute**

The Turing Way
A how to guide for
reproducible research
Kirstie Whitaker

#ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>



An introduction to me



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Picture credit: Chris Gorgolewski
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	B	C	I	J	K	L	M
2			Real GDP growth				
3			Debt/GDP				
4	Country	Coverage	30 or less	30 to 60	60 to 90	90 or above	30 or less
26			3.7	3.0	3.5	1.7	5.5
27	Minimum		1.6	0.3	1.3	-1.8	0.8
28	Maximum		5.4	4.9	10.2	3.6	13.3
29							
30	US	1946-2009	n.a.	3.4	3.3	-2.0	n.a.
31	UK	1946-2009	n.a.	2.4	2.5	2.4	n.a.
32	Sweden	1946-2009	3.6	2.9	2.7	n.a.	6.3
33	Spain	1946-2009	1.5	3.4	4.2	n.a.	9.9
34	Portugal	1952-2009	4.8	2.5	0.3	n.a.	7.9
35	New Zealand	1948-2009	2.5	2.9	3.9	-7.9	2.6
36	Netherlands	1956-2009	4.1	2.7	1.1	n.a.	6.4
37	Norway	1947-2009	3.4	5.1	n.a.	n.a.	5.4
38	Japan	1946-2009	7.0	4.0	1.0	0.7	7.0
39	Italy	1951-2009	5.4	2.1	1.8	1.0	5.6
40	Ireland	1948-2009	4.4	4.5	4.0	2.4	2.9
41	Greece	1970-2009	4.0	0.3	2.7	2.9	13.3
42	Germany	1946-2009	3.9	0.9	n.a.	n.a.	3.2
43	France	1949-2009	4.9	2.7	3.0	n.a.	5.2
44	Finland	1946-2009	3.8	2.4	5.5	n.a.	7.0
45	Denmark	1950-2009	3.5	1.7	2.4	n.a.	5.6
46	Canada	1951-2009	1.9	3.6	4.1	n.a.	2.2
47	Belgium	1947-2009	n.a.	4.2	3.1	2.6	n.a.
48	Austria	1948-2009	5.2	3.3	-3.8	n.a.	5.7
49	Australia	1951-2009	3.2	4.9	4.0	n.a.	5.9
50							
51			4.1	2.8	2.8	=AVERAGE(L30:L44)	

<https://statmodeling.stat.columbia.edu/2013/04/16/memo-to-reinhart-and-rogooff-i-think-its-best-to-admit-your-errors-and-go-on-from-there>

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Magazine

Reinhart, Rogoff... and Herndon: The student who caught out the profs

By Ruth Alexander
BBC News

© 20 April 2013

f t e Share

This week, economists have been astonished to find that a famous academic paper often used to make the case for austerity cuts contains major errors. Another surprise is that the mistakes, by two eminent Harvard professors, were spotted by a student doing his homework.

It's 4 January 2010, the Marriott Hotel in Atlanta. At the annual meeting of the American Economic Association, Professor Carmen Reinhart and the former chief economist of the International Monetary Fund, Kim Rogoff, are presenting a research paper called Growth in a Time of Debt.



<https://statmodeling.stat.columbia.edu/2013/04/16/memo-to-reinhart-and-rogooff-i-think-its-best-to-admit-your-errors-and-go-on-from-there>
<https://www.bbc.co.uk/news/magazine-22223190>

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The humans are the
hardest part of
reproducibility



Is not considered
for promotion

Held to higher
standards than
others

Publication bias
towards novel
findings

Barriers to reproducible research

Requires
additional
skills

Plead the 5th

Support additional
users

Takes time

<https://doi.org/10.6084/m9.figshare.5537101>
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		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable

<https://the-turing-way.netlify.com/reproducibility/03/definitions.html>

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The Turing Institute



<https://www.turing.ac.uk/news/enigma-machine-goes-display-alan-turing-institute>

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<https://www.bbc.co.uk/programmes/p0704h04>

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<https://doi.org/10.5281/zenodo.3238189>



<https://bletchleypark.org.uk>
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University network



THE UNIVERSITY
of EDINBURGH



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The Institute's partners and collaborators



Lloyd's Register
Foundation



GCHQ

[dstl]



Ministry
of Defence



HSBC

uclh

accenture

NATS



British Heart
Foundation



Microsoft

TOYOTA

mobility
FOUNDATION



Office for
National Statistics

GREATER
LONDON
AUTHORITY

CRAY

nationalgrid

SIEMENS



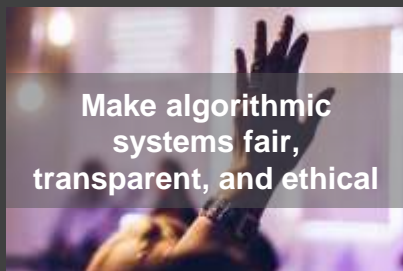
Cystic
Fibrosis Trust



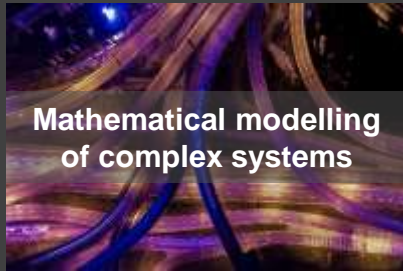
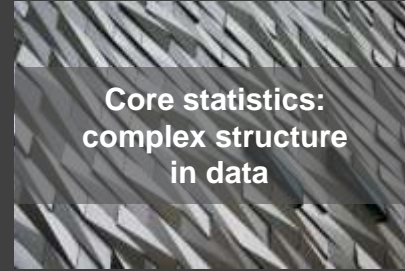
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Challenges

Advance data science and artificial intelligence to...



Core capabilities



Martin O'Reilly

“Make reproducible
research too easy not to
do.”



<https://www.turing.ac.uk/people/researchers/martin-oreilly>
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“Make reproducible research too easy not to do.

Do you need a biscuit?

If we can't do it here, we can't do it at all.”



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The Turing Way



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1. Introduction

2. Reproducibility

3. Open Research

4. Version Control

5. Collaborating on GitHub/GitLab

6. Research Data Management

7. Reproducible Environments

8. Testing

9. Reviewing

10. Continuous Integration

11. Reproducible Research with Make

12. Risk Assessment

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, software 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

<https://the-turing-way.netlify.com/introduction/introduction>

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Held to higher
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Publication bias
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Requires
additional
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Plead the 5th

Support additional
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Takes time

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Catherine Lawrence

“We should ensure all our processes for running programmes are FAIR.

- Findable (intranet)
- Accessible (EDI)
- Interoperable across programmes and projects
- Reusable (bus factor)”

<https://www.turing.ac.uk/people/business-team/catherine-lawrence>

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Testing for research



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Is your code doing what you think its doing?



<https://www.toptal.com/qa/how-to-write-testable-code-and-why-it-matters>

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```
Assert.AreEqual(  
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    "Morning" )
```



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Louise Bowler

“Add a test before you
change anything.”



<https://www.turing.ac.uk/people/researchers/louise-bowler>
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<https://doi.org/10.5281/zenodo.3238189>

Louise Bowler

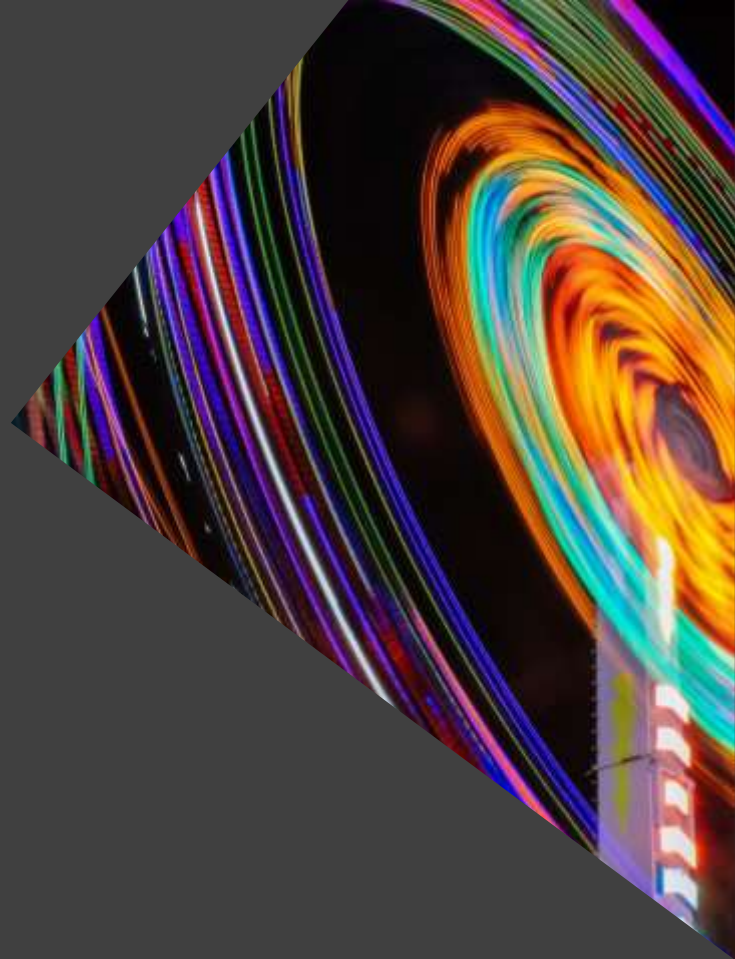
“Add a test before you change anything.

Particularly if you’re just going to tidy up your code before sharing it.”



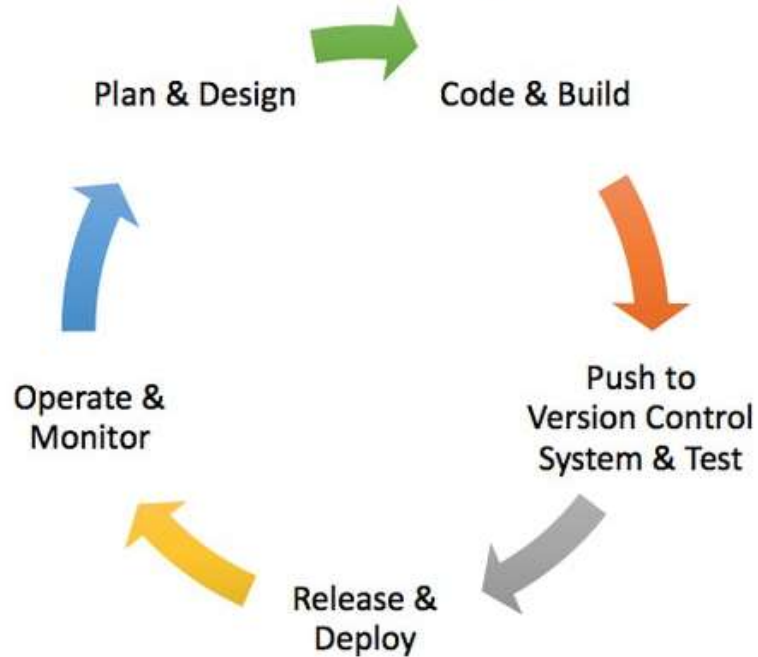
<https://www.turing.ac.uk/people/researchers/louise-bowler>
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Continuous Analysis



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<https://doi.org/10.5281/zenodo.3238189>

Continuous Integration

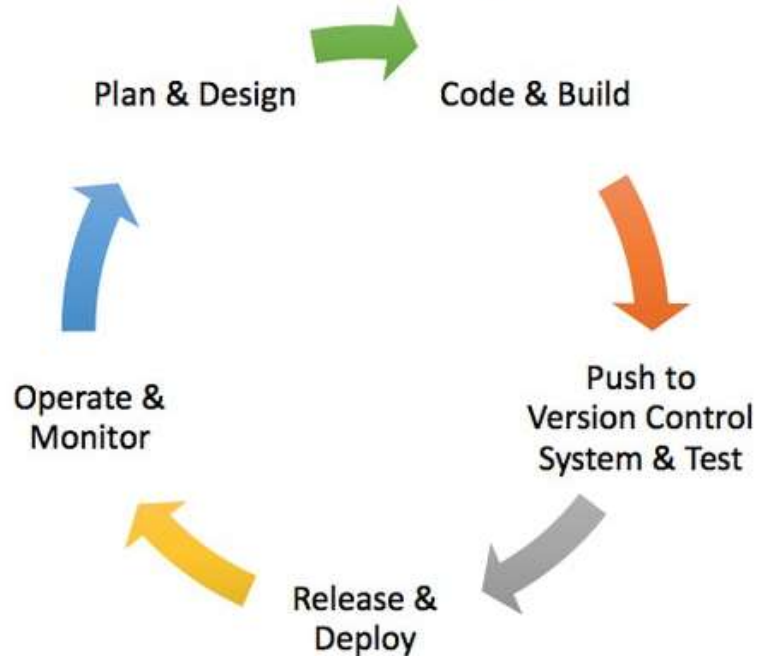


<https://elifesciences.org/labs/e623676c/reproducibility-automated>

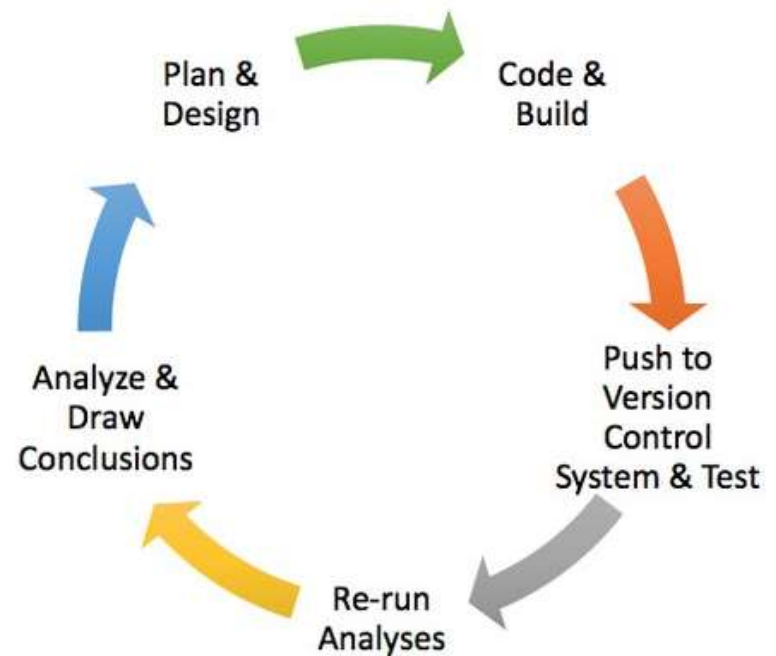
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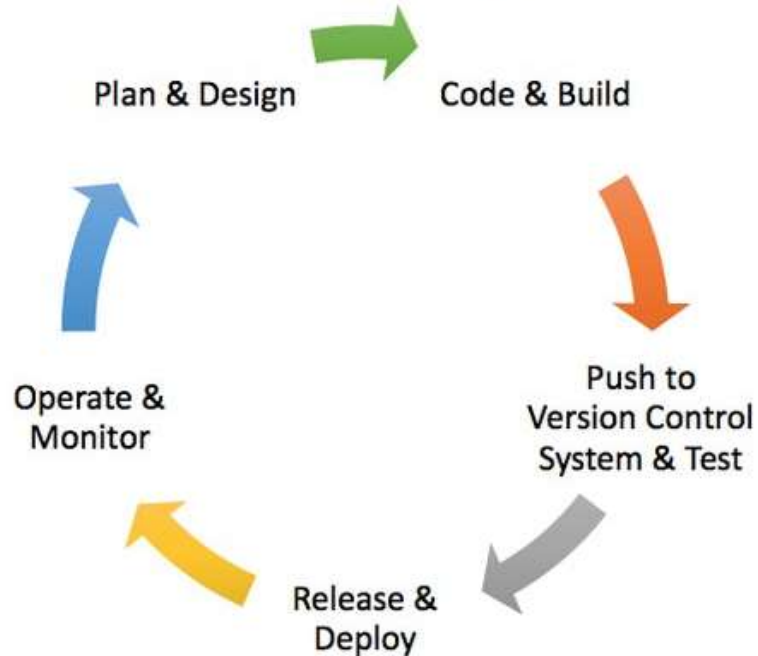
Continuous Integration



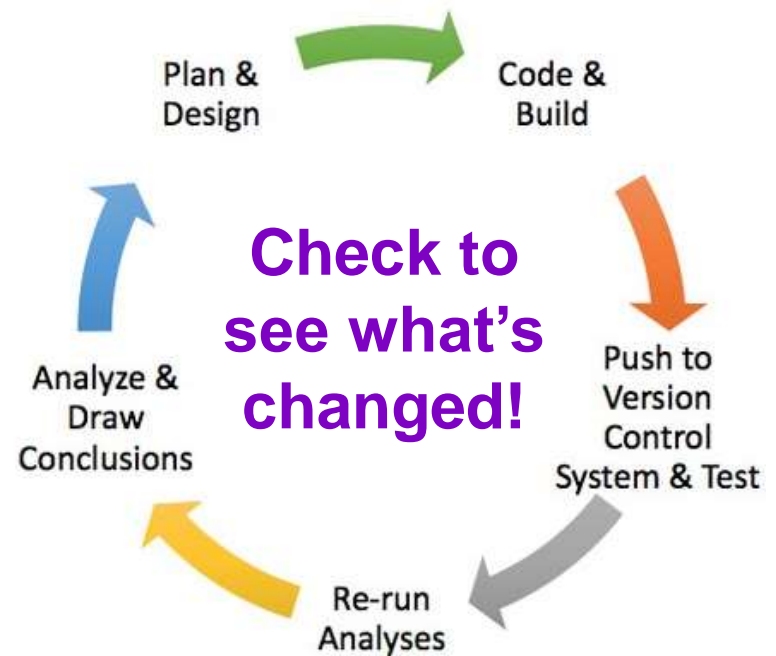
Continuous Analysis



Continuous Integration



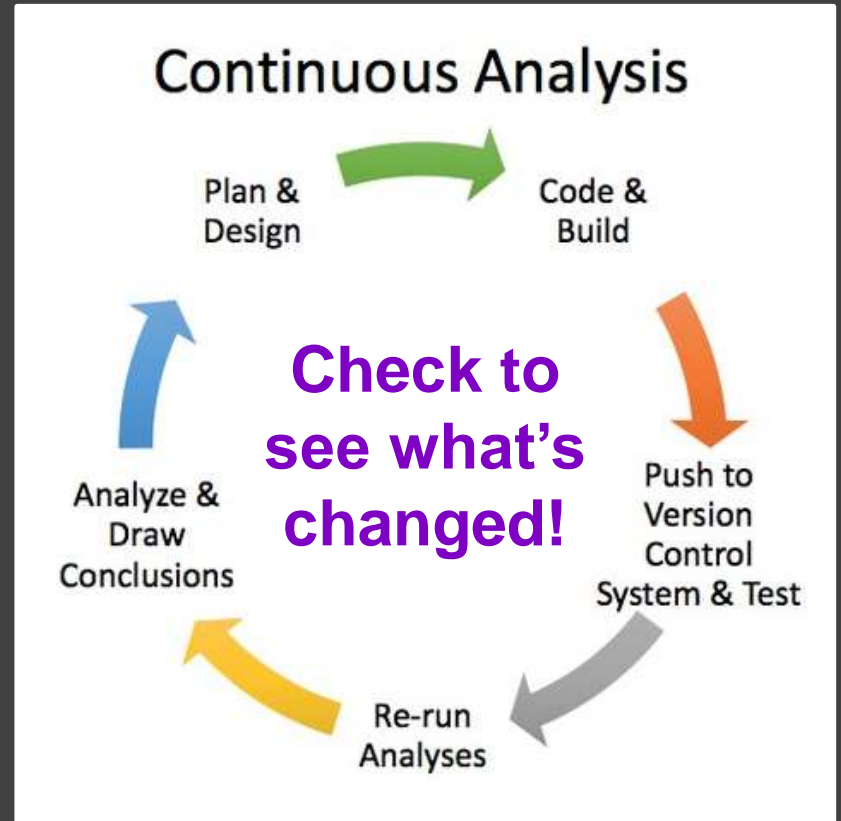
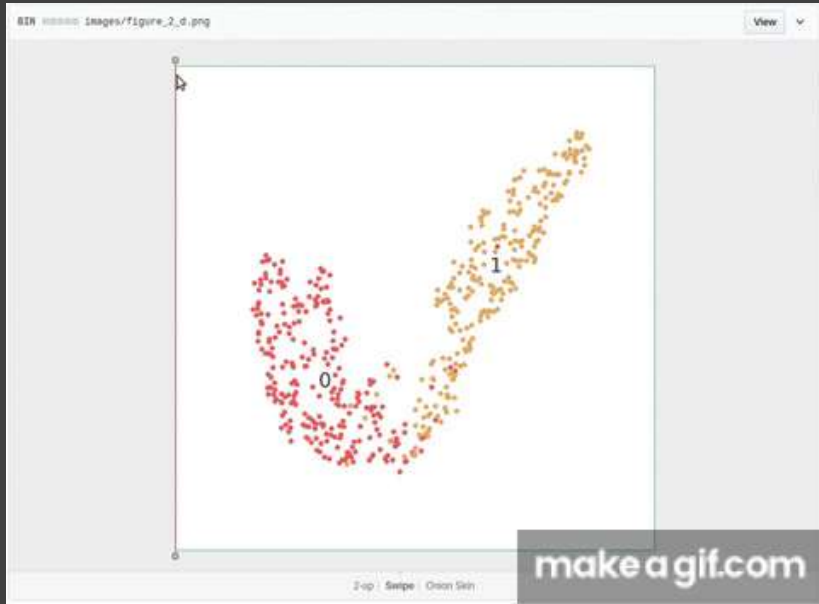
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Travis CI interface showing the build status for the repository `alan-turing-institute / signatures-psychiatry`.

My Repositories

- `alan-turing-institute/Posterior` # 98
Duration: 2 hrs 11 min 35 sec
Finished: about 9 hours ago
- `alan-turing-institute/signatures` # 1
Duration: 1 min 41 sec
Finished: about 12 hours ago
- `bids-standard/bids-specification` # 506
Duration: 32 sec
Finished: a day ago

Current Build


`lab-add-synth-data` Add travis config
#1 passed
Restart build

Commit: `023d957`
Compare: `e63a607..023d957`
Branch: `lab-add-synth-data`
Author: Louise Bowler

Python: 2.7

Job log | View config

<https://github.com/alan-turing-institute/signatures-psychiatry>
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Dashboard

My Repositories
Running (0/0)
+

✗
alan-turing-institute/Posterior
98

⌚ Duration: 2 hrs 11 min 35 sec
 📅 Finished: about 9 hours ago

✓
alan-turing-institute/signature
1

⌚ Duration: 1 min 41 sec
 📅 Finished: about 12 hours ago

✓
bids-standard/bids-specificat
50

⌚ Duration: 32 sec
 📅 Finished: a day ago


Job log
View config

Remove log
Raw log

```

> Worker information
> Build system information
412
413 docker stop/waiting
414
415 $ git clone --depth=50 --branch=lab-add-synth-data https://github.com/alan-turing-institute
416
417 $ source ~/virtualenv/python2.7/bin/activate
418 $ python --version
419 Python 2.7.14
420
421 $ pip --version
422 pip 9.0.1 from /home/travis/virtualenv/python2.7.14/lib/python2.7/site-packages (python 2.7)
423 $ pip install -r requirements.txt
424
425 $ pytest -v
426
427 ===== test session starts =====
428 platform linux2 -- Python 2.7.14, pytest-4.4.1, py-1.8.2, pluggy-0.11.0 -- /home/travis/virtualenv/python2.7.14/bin/python
429 cachedir: .pytest_cache
430 rootdir: /home/travis/build/alan-turing-institute/signatures-psychiatry
431 collected 4 items
432
433 test_synthetic.py::test_pairwise_group_classification_synth[239673-expected_values8] PASSED [ 25%]
434
435 test_synthetic.py::test_pairwise_group_classification_synth[425709-expected_values1] PASSED [ 50%]
436
437 test_synthetic.py::test_pairwise_group_classification_synth[772102-expected_values2] PASSED [ 75%]
438
439 test_synthetic.py::test_pairwise_group_classification_synth_defaults PASSED [100%]
440
441 ===== 4 passed in 33.00 seconds =====
442
443 The command "pytest -v" exited with 0.
444
445
446 Done. Your build exited with 0.
  
```

Top



build
unknown

More options
⋮

Restart build

Download log file
Download file

<https://github.com/alan-turing-institute/signatures-psychiatry>
 #ORLancaster #TuringWay @kirstie_j
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- Run the analysis from start to finish as you're developing
- Many times tests will fail as expected: you're developing the analysis!
- Sometimes tests will fail unexpectedly
- CI makes you be explicit about what has changed



<https://www.youtube.com/watch?v=3GwjfUFyY6M>
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Becky Arnold

“There are a lot of things you need to know before you can jump into continuous integration.

Version control is a prerequisite for pretty much everything.”



<https://software.ac.uk/about/fellows/becky-arnold>

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8. Testing

9. Reviewing

10. Continuous Integration

11. Reproducible Research with
Make

12. Risk Assessment

Continuous integration

Prerequisite	Importance	Notes
Experience with the command line	Necessary	A tutorial on working via the command line can be found here
Version control	Necessary	See the chapter on this for more information
Testing	Very helpful	See the chapter on this for more information
Reproducible computational environments	Necessary	See the chapter on this for more information, particularly the sections on YAML files and containers

Table of contents

- [Summary](#)
- [How this will help you/ why this is useful](#)
 - [What are continuous delivery and continuous deployment?](#)
- [What is Travis and how does it work?](#)
- [Setting up continuous integration with Travis](#)
 - [Basic steps](#)

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

#ORLancaster #TuringWay @kirstie_j

<https://doi.org/10.5281/zenodo.3238189>

Version control



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"FINAL".doc



FINAL.doc!



FINAL_rev.2.doc



FINAL_rev.6.COMMENTS.doc

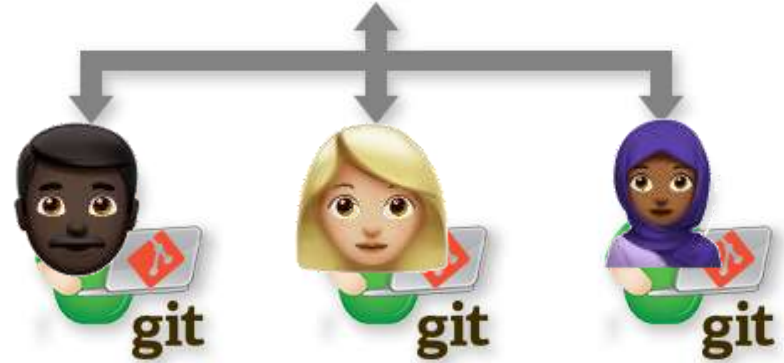


FINAL_rev.8.comments5.
CORRECTIONS.doc



FINAL_rev.18.comments7.
corrections9.MORE.30.doc

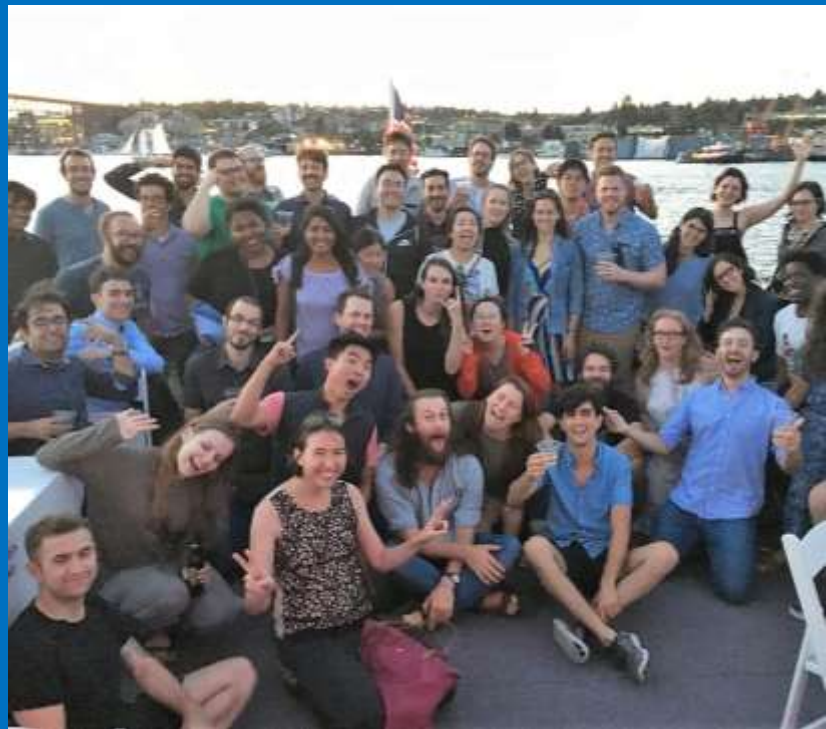
FINAL_rev.22.comments49.
corrections.10.##\$%WHYDID
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<http://phdcomics.com/comics/archive.php?comid=1531>
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<https://doi.org/10.5281/zenodo.3238189>

Neurohackademy

“Every hackathon should have a gong that you can ring when you complete your first pull request.”



<https://neurohackademy.org>
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<https://www.youtube.com/watch?v=hSsjxbRxgqY>
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Workshops & trainings



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<https://github.com/alan-turing-institute/the-turing-way/tree/master/workshops>

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<https://doi.org/10.5281/zenodo.3238189>

Rosie Higman

“There’s no point in running events when you’re only preaching to the choir. We need to show researchers the selfish reasons to follow our recommendations.”



<https://rosiehigman.wordpress.com>
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<https://doi.org/10.5281/zenodo.3238189>



<https://www.software.ac.uk/cw19>
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<https://doi.org/10.5281/zenodo.3238189>

A Good Checklist

- ✓ Adds value
- ✓ Modular
- ✓ Customisable
- ✓ Guides & encourages communication



Checklist Manifesto

- **Codify best practice:** distil and collate community knowledge.
- **Level the team:** Spread responsibility and level authority.
- **Create awareness:** Bring focus to the routine, prepare for the unexpected.
- **Bring teams together:** Act of reviewing fosters feeling of teamwork and shared ownership.

🔗 GitHub issue templates as checklists for Open Reproducible Research

- **Library of customisable templates for common tasks** + infrastructure for domain specific variations
- **Ability to programmatically create domain/task specific issue sets**
- **Open for contribution** *Community ownership and sense of value imperative!*

Part of the Turing Way project - <https://github.com/alan-turing-institute/the-turing-way>

@annakrystalli

<https://checklib.github.io/checklib>
#ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>

Anna Krystalli

“Checklists are a great way to make it really easy for busy people to do reproducible research. They can catch easily forgotten steps.”



<https://alexmorley.me>
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<https://doi.org/10.5281/zenodo.3238189>

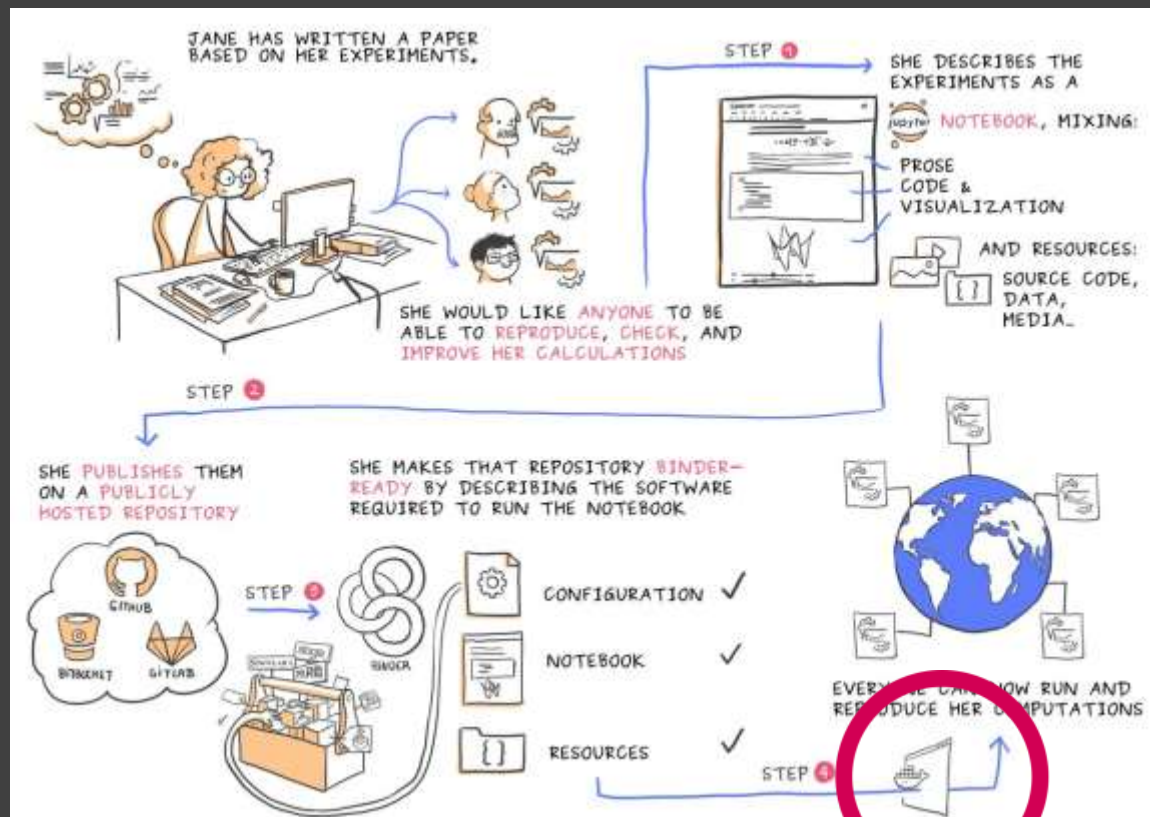
Turing Way & Binder



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<https://doi.org/10.5281/zenodo.3238189>

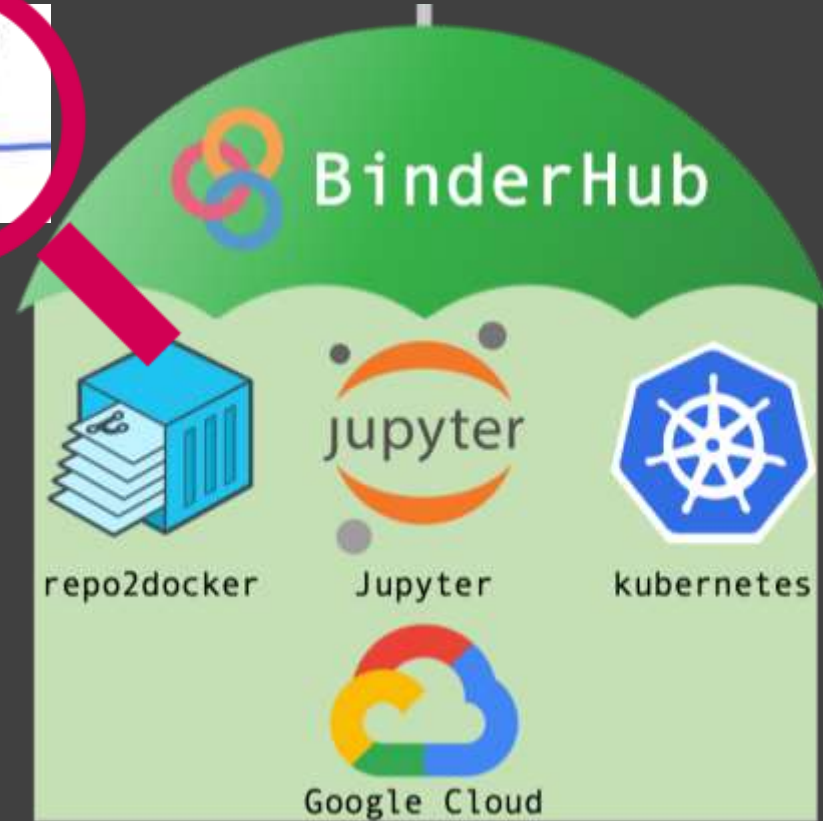


Courtesy of Juliette Taka: <https://twitter.com/mybinderteam/status/1082556317842264064>
#ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>



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<https://doi.org/10.5281/zenodo.3238189>

- Coordinate cloud computing resources with Kubernetes (k8s)
- Make it easy for users to access with a JupyterHub
- Set up the environment from your GitHub repository



<https://binderhub.readthedocs.io>
#ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>

Sarah Gibson

“It took me a while to feel like I knew enough to contribute to Binder. But the team are always so excited to have my input. Its really motivating to be part of such a welcoming community.”



<https://www.turing.ac.uk/people/researchers/sarah-gibson>
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<https://doi.org/10.5281/zenodo.3238189>

- Check analysis on my phone
- Share the responsibility with busy PIs
- Requires version control, capturing environment and new build for each change



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<https://doi.org/10.5281/zenodo.3238189>

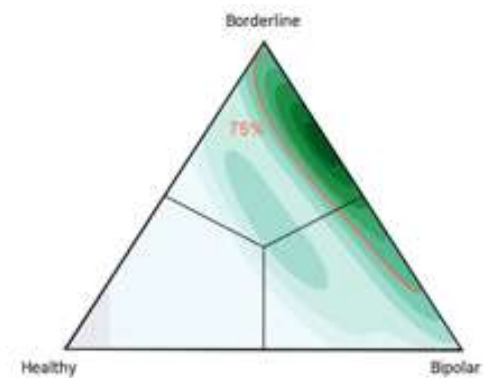
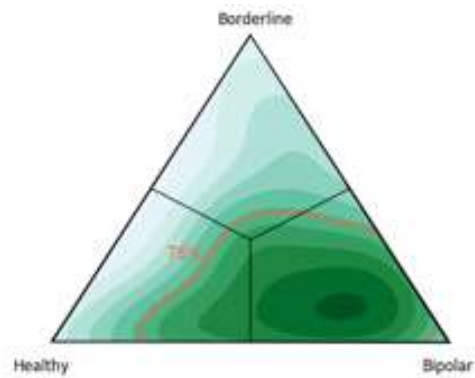
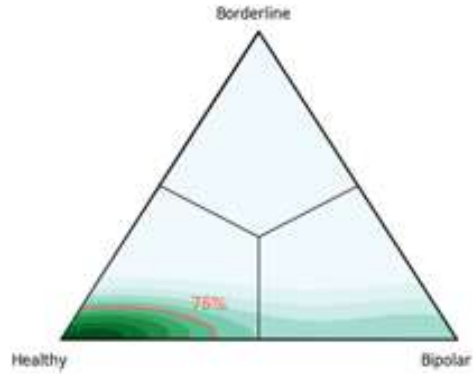
Champion: Terry Lyons



A signature-based machine learning model for bipolar disorder and borderline personality disorder

Imanol Perez Arribas, Guy Goodwin, John Geddes, Terry Lyons, Kate Saunders





Imanol Pérez Arribas

“We can’t share the data.
The original researchers did
not ask for consent to do so.
We can share simulated and
synthetic data so that
researchers can feel
confident in applying our
method to their own data.”

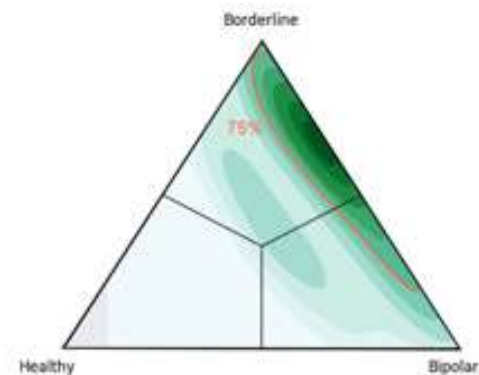
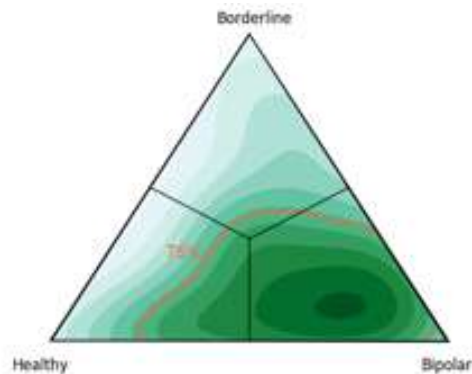
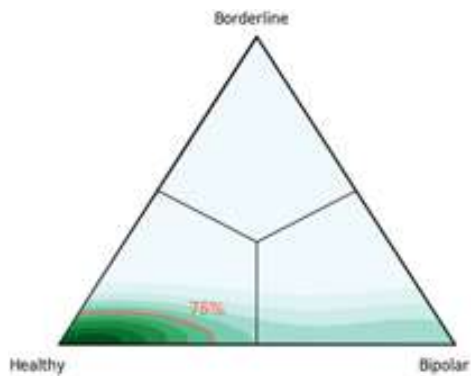


<https://www.maths.ox.ac.uk/people/imanol.perez>

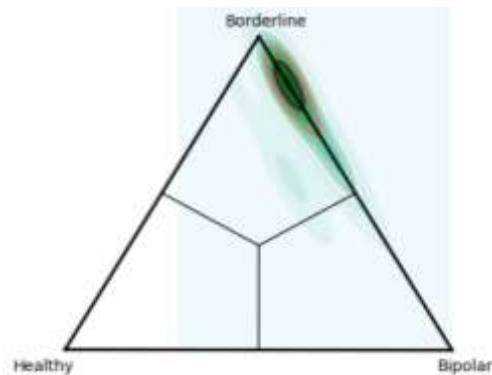
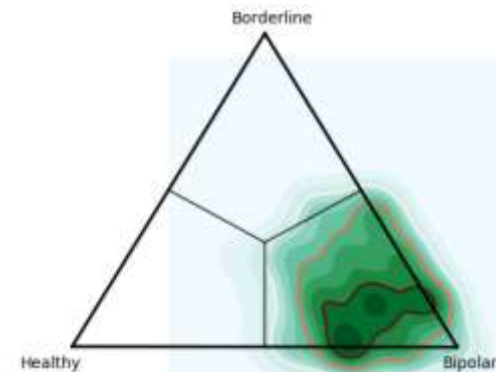
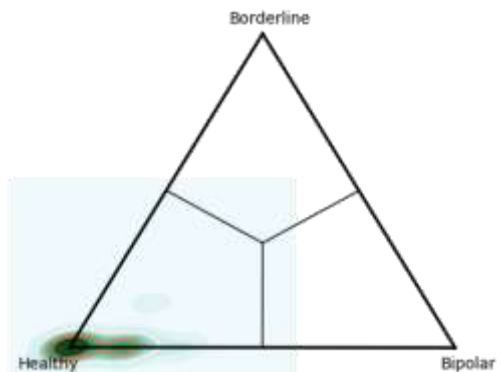
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<https://doi.org/10.5281/zenodo.3238189>

Publication



Synthetic Data



<https://github.com/alan-turing-institute/signatures-psychiatry>

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<https://doi.org/10.5281/zenodo.3238189>

Gertjan van den Burg

“The fun part of data science is the modelling. Being able to read in information from a csv file should not be the hardest part.”



<https://gertjanvandenburgh.com>
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<https://doi.org/10.5281/zenodo.3238189>

alan-turing-institute / CleverCSVDemo

Code Issues Pull requests Actions Projects Wiki Insights

No description, website, or topics provided.

23 commits 1 branch 0 releases 1 contributor MIT

branches: master New pull request

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GjrdBurg add more examples and clarify · Latest commit 1304aaf 4 days ago

data	add more examples and clarify	a day ago
images	add qr code with link to repo	12 days ago
CSV_dialect_detection_with_CleverCSV.ipynb	add more examples and clarify	a day ago
CSV_dialect_detection_with_CleverCSV.md	add more examples and clarify	a day ago
LICENSE	Add makefile and create the notebook from Markdown	7 days ago
Makefile	Add makefile and create the notebook from Markdown	7 days ago
README.md	Add binder thingy to Readme	13 days ago
requirements.txt	add termcolor dependency	6 days ago

README.md

CleverCSV Demonstration

[launch binder](#)

This repository contains a demonstration of CleverCSV, a Python package for robust handling of non-standard (messy) CSV files. It is based on the work [Wrangling Messy CSV Files by Detecting Row and Type Patterns](#) by Gertjan van den Burg, Alfredo Nazabal, and Charles Sutton.

– <https://github.com/alan-turing-institute/CleverCSVDemo>

– “Wrangling Messy CSV Files by Detecting Row and Type Patterns”
arXiv:1811.11242

#ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>

CSV dialect detection with CleverCSV

Author: [Gertjan van den Burg](#)

In this note we'll show some examples of using CleverCSV, a package for handling messy CSV files. We'll start with a motivating example and then show some other files where CleverCSV shines. CleverCSV was developed as part of a research project on automating data wrangling. It achieves an accuracy of 97% on over 9300 real-world CSV files and improves the accuracy on messy files by 21% over standard tools.

Handy links:

- [Paper on arXiv](#)
- [CleverCSV on GitHub](#)
- [CleverCSV on PyPI](#)
- [Reproducible Research Repo](#)

IMDB Movie data

Alice is a data scientist who would like to analyse the movie ratings on IMDB for movies of different genres. She found [a dataset shared by a user on Kaggle](#) that contains information of over 14,000 movies. Great!

The data is stored in a CSV file, which is a very common data format for sharing tabular data. The first few lines of the file look like this:

IMDB Movie data

Alice is a data scientist who would like to analyse the movie ratings on IMDB for movies of different genres. She found [a dataset shared by a user on Kaggle](#) that contains information of over 14,000 movies. Great!

The data is stored in a CSV file, which is a very common data format for sharing tabular data. The first few lines of the file look like this:

```
fn,tid,title,wordsInTitle,url,imdbRating,ratingCount,duration,year,type,nrOfWins,nrOfNominations,nrOfPhotos,nrOf
NewsArticles,nrOfUserReviews,nrOfGenre>Action,Adult,Adventure,Animation,Biography,Comedy,Crime,Documentary,Drama
,Family,Fantasy,FilmNoir,GameShow,History,Horror,Music,Musical,Mystery,News,RealityTV,Romance,SciFi,Short,Sport,
TalkShow,Thriller,War,Western
titles01/tt0012349,tt0012349,Der Vagabund und das Kind (1921),der vagabund und das kind,http://www.imdb.com/titl
e/tt0012349/,8.4,40550,3240,1921,video.movie,1,0,19,96,85,3,0,0,0,0,1,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0
titles01/tt0015864,tt0015864,Goldrausch (1925),goldrausch,http://www.imdb.com/title/tt0015864/,8.3,45319,5700,19
25,video.movie,2,1,35,110,122,3,0,0,1,0,0,1,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
titles01/tt0017136,tt0017136,Metropolis (1927),metropolis,http://www.imdb.com/title/tt0017136/,8.4,81007,9180,19
27,video.movie,3,4,67,428,376,2,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
titles01/tt0017925,tt0017925,Der General (1926),der general,http://www.imdb.com/title/tt0017925/,8.3,37521,6420,
1926,video.movie,1,1,53,123,219,3,1,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
titles01/tt0021749,tt0021749,Lichter der Großstadt (1931),lichter der gro stadt,http://www.imdb.com/title/tt0021
749/,8.7,70057,5220,1931,video.movie,2,0,38,187,186,3,0,0,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

Seems pretty standard, let's load it with Pandas!

In [1]: %xmode Minimal

```
In [1]: %xmode Minimal
import pandas as pd
df = pd.read_csv('./data/imdb.csv')
```

Exception reporting mode: Minimal

ParserError: Error tokenizing data. C error: Expected 44 fields in line 66, saw 46

Oh, that doesn't work. Maybe there's something wrong with the file? Let's try opening it with the Python CSV reader:

```
In [2]: import csv
with open('./data/imdb.csv', 'r', newline='') as fid:
    dialect = csv.Sniffer().sniff(fid.read())
    print("Detected delimiter = %r, quotechar = %r" % (dialect.delimiter, dialect.quotechar))
    fid.seek(0)
    reader = csv.reader(fid, dialect=dialect)
    rows = list(reader)

print("Loaded %i rows." % len(rows))
```

Detected delimiter = ' ', quotechar = '"'
Loaded 13928 rows.

Huh, that's strange, Python thinks the space is the delimiter and loads 13928 rows, but the file should contain 14,762 rows according to the documentation. What's going on here?

Huh, that's strange, Python thinks the space is the delimiter and loads 13928 rows, but the file should contain 14,762 rows according to the documentation. What's going on here?

It turns out that on the 65th line of the file, there's a movie with the title `Dr. Seltsam\, oder wie ich lernte\, die Bombe zu lieben (1964)` (the German version of Dr. Strangelove). The title has commas in it, that are escaped using the `\` character! Why are CSV files so hard? 😞

CleverCSV to the rescue!

CleverCSV detects the dialect of CSV files much more accurately than existing approaches, and it is therefore robust against these kinds of format variations. It even has a wrapper that works with DataFrames!

```
In [3]: from csv.wrappers import csv2df
df = csv2df('./data/imdb.csv')
df
```

Out [3]:

	fn	tid	title	wordsInTitle	url	imdbRating	ratingCount	duration	year	type	...	News
0	titles01/tt0012349	tt0012349	Der Vagabund und das Kind (1921)	der vagabund und das kind	http://www.imdb.com/title/tt0012349/	8.4	40550.0	3240.0	1921.0	video.movie	...	0
1	titles01/tt0015864	tt0015864	Goldrausch (1925)	goldrausch	http://www.imdb.com/title/tt0015864/	8.3	45319.0	5700.0	1925.0	video.movie	...	0
2	titles01/tt0017136	tt0017136	Metropolis (1927)	metropolis	http://www.imdb.com/title/tt0017136/	8.4	81007.0	9180.0	1927.0	video.movie	...	0
3	titles01/tt0017925	tt0017925	Der General (1926)	der general	http://www.imdb.com/title/tt0017925/	8.3	37521.0	6420.0	1926.0	video.movie	...	0
			Lichter der	lichter der gro	http://www.imdb.com							

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Out [3]:

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1	titles01/tt0015864	tt0015864	Goldrausch (1925)	goldrausch	http://www.imdb.com/title/tt0015864/	8.3	45319.0	5700.0	1925.0	video.movie	...	0
2	titles01/tt0017136	tt0017136	Metropolis (1927)	metropolis	http://www.imdb.com/title/tt0017136/	8.4	81007.0	9180.0	1927.0	video.movie	...	0
3	titles01/tt0017925	tt0017925	Der General (1926)	der general	http://www.imdb.com/title/tt0017925/	8.3	37521.0	6420.0	1926.0	video.movie	...	0
			Lichter der	lichter der gro	http://www.imdb.com							

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3													
+ - Copy Paste Run Markdown													
df													
			Episode 2005)	episode	/title/tt0675644/								
14757	titles04/index.html.9992	tt0675644	"Playhouse 90" The Miracle Worker (TV Episode ...	playhouse the miracle worker tv episode	http://www.imdb.com/title/tt0675644/	7.3	8.0	5400.0	1957.0	video.episode	...	0	
14758	titles04/index.html.9994	tt0679222	"Private Screenings" Robert Mitchum and Jane R...	private screenings robert mitchum and jane rus...	http://www.imdb.com/title/tt0679222/	7.0	20.0	3600.0	1996.0	video.episode	...	0	
14759	titles04/index.html.9995	tt0680064	"Providence" All the King's Men (TV Episode 2002)	providence all the king s men tv episode	http://www.imdb.com/title/tt0680064/	NaN	NaN	3600.0	2002.0	video.episode	...	0	
14760	titles04/index.html.9997	tt0681024	"QI" Adam (TV Episode 2003)	qi adam tv episode	http://www.imdb.com/title/tt0681024/	7.6	89.0	1800.0	2003.0	video.episode	...	0	
14761 rows x 44 columns													

Hooray! 🎉

How does it work? CleverCSV searches the space of all possible dialects of a file, and computes a *data consistency measure* that quantifies how much the resulting table "looks like real data". The consistency measure combines patterns of row lengths in the parsing result and the data type of the resulting cells. This mimicks how a human would identify the dialect. If you're wondering why this problem is hard, it's because every dialect will give you some table, but not necessarily the correct one. More details can be found [in the paper](#).

<https://github.com/alan-turing-institute/CleverCSVDemo>
 #ORLancaster #TuringWay @kirstie_j
<https://doi.org/10.5281/zenodo.3238189>

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Author: [Gertjan van den Burg](#)

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- [Reproducible Research Repo](#)



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alan-turing-institute / CSV_Wrangling

Code Issues Pull requests Projects Wiki Insights

Repository for reproducibility of the CSV file project

reproducible-research reproducible-paper reproducibility reproducible-science csv-files csv csv-parsing

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data	add data dir placeholder	5 months ago
design	Fix indent	5 months ago
results/test	Replace absolute path by relative path	5 months ago
scripts	Make normal form output the same as the other detectors	5 months ago
.gitmodules	initial commit	5 months ago
LICENSE	Add the license	5 months ago
Makefile	Simplify makefile	5 months ago
README.md	Simplify makefile	5 months ago
requirements.txt	Add missing package	5 months ago
urls_github.json	Update GitHub data urls to direct links	5 months ago
urls_sandbox.json	initial commit	5 months ago

README.md

CSV Wrangling

This is the repository for reproducing the experiments in the paper:

[Wrangling Messy CSV files by Detecting Row and Type Patterns](#)

by G.J.J. van den Burg, A. Nazabal and C. Sutton.

– https://github.com/alan-turing-institute/CSV_Wrangling

– “Wrangling Messy CSV Files by Detecting Row and Type Patterns”
arXiv:1811.11242

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<https://doi.org/10.5281/zenodo.3238189>

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Code Issues Pull requests Projects Wiki Insights

Repository for reproducibility of the CSV file project

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arXiv:1811.11242

#ORLancaster #TuringWay @kirstie_
<https://doi.org/10.5281/zenodo.3238189>

The Turing Way

1. Introduction
2. Reproducibility
3. Open Research
4. Version Control
5. Reproducible Environments
6. Testing
7. Reviewing
8. Continuous Integration
9. Research Data Management
10. Reproducible Research with Make

What is Make

Make is a build automation tool. It uses a configuration file called a Makefile that contains the *rules* for what to build. Make builds *targets* using *recipes*. Targets can optionally have *prerequisites*. Prerequisites can be files on your computer or other targets. Make determines what to build based on the dependency tree of the targets and prerequisites (technically, this is a [directed acyclic graph](#)). It uses the *modification time* of prerequisites to update targets only when needed.

Why use Make for Reproducible Research?

There are several reasons why Make is a good tool to use for reproducible research:

1. Make is available on many platforms
2. Make is easy to learn
3. Makefiles are text files, which makes them easy share and keep in version control.
4. Many people are already familiar with Make
5. Using Make doesn't exclude using other tools such as Travis, Docker, etc.

Learn Make by Example

One of the things that might scare people off from using Make is that existing Makefiles can seem daunting and it may seem difficult to tailor to your own needs. In this hands-on tutorial we will

<https://the-turing-way.netlify.com/make/make.html>

#ORLancaster #TuringWay @kirstie_j

<https://doi.org/10.5281/zenodo.3238189>

Case studies

- Show that it can be done
- Provide templates and starting points
- Generate new content
- Inspire



A global collaboration



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<https://doi.org/10.5281/zenodo.3238189>

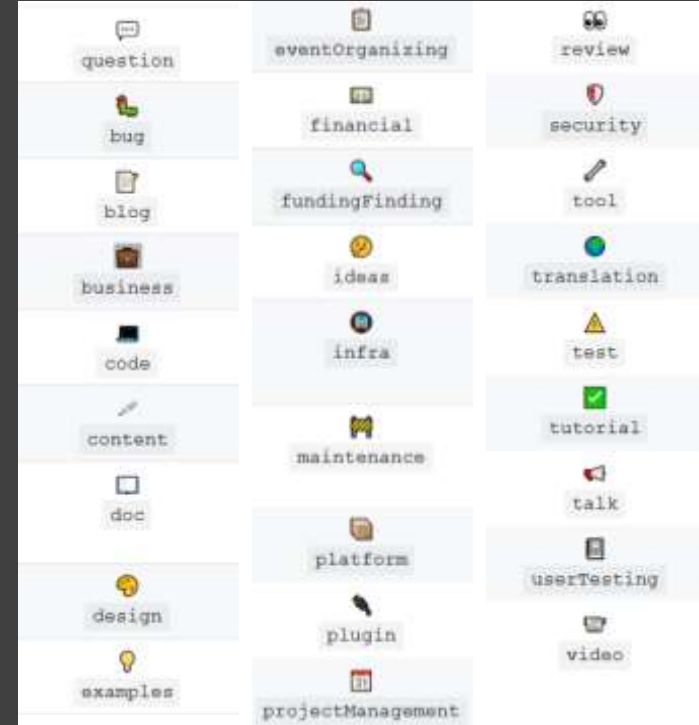
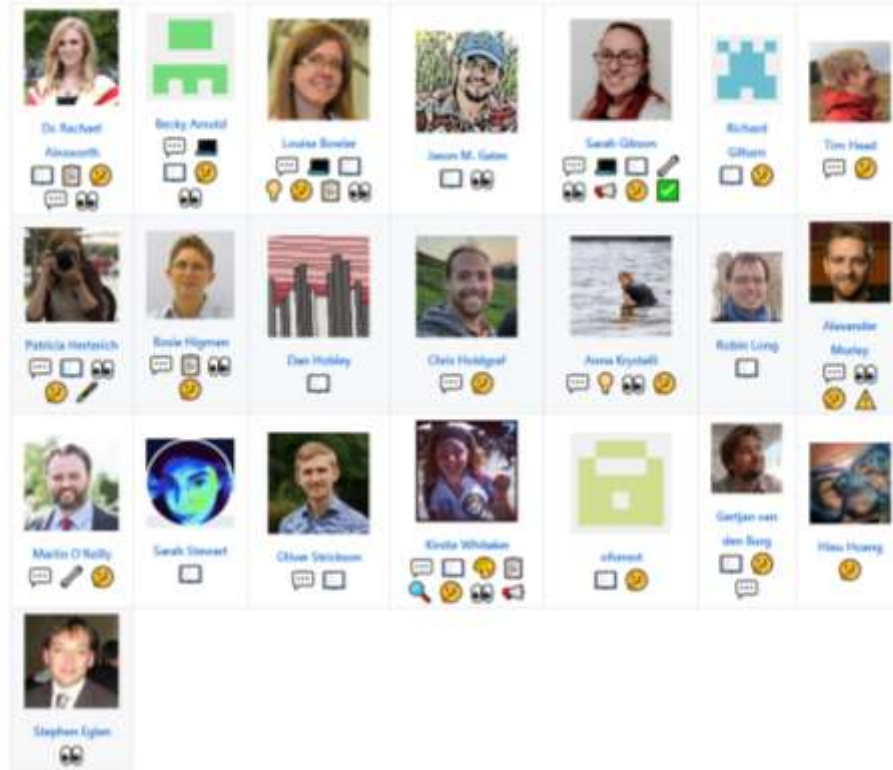
Patricia Herterich

“What really sets The Turing Way apart is HOW we’re writing the book. The focus on community, the commitment to transparency and working open right from the beginning is an exciting (and terrifying) new way of working.”



<https://rd-alliance.org/users/patricia-herterich>
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<https://doi.org/10.5281/zenodo.3238189>

Thanks goes to these wonderful people (emoji key):



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

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<https://doi.org/10.5281/zenodo.3238189>

<https://allcontributors.org/docs/en/bot/overview>
<https://allcontributors.org/docs/en/emoji-key>

Open Leadership Principles



Understanding

You make the work accessible and clear

Read more

<https://mozilla.github.io/olm-whitepaper>

moz://a



Sharing

You make the work easy to adapt, reproduce, and spread



Participation & Inclusion

You build shared ownership and agency to make the work inviting and sustainable for all.

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Rachael Ainsworth

“Personas and pathways exercises let me reflect on what people are finding difficult about contributing to The Turing Way. The project can only reach its potential if it is easy for a diverse constellation of contributions.”



<https://ainsworth.github.io>
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<https://doi.org/10.5281/zenodo.3238189>

alan-turing-institute / the-turing-way

Code Issues 94 Pull requests 5 Actions Projects 2 Wiki Insights

[WIP] Add personas & pathways #421

Open rainworth wants to merge 5 commits into alan-turing-institute:personas from rainworth:ka-personas

Conversation Commits Checks Files changed

rainworth commented 8 days ago • edited • Collaborator

Summary

This document describes the personas and pathways for contributors and users to guide the development of the Turing Way following Mozilla Open Leadership training. Specifically, it will help us identify any barriers to contributing in the Contributing Guidelines and README. It is based on the personas.md document in the Open Leadership Framework repository.

Related to #403

List of changes proposed in this PR (pull-request)

To do:

- ☒ Introduction to personas and pathways
- ☒ Contributor personas with limited/no Git/GitHub experience
- ☒ Contributor personas with Git/GitHub experience and book topic expertise
- ☐ User persona: early career researcher
- ☐ User persona: supervisor / PI
- ☐ User persona: funder / publisher / admin
- ☒ Use gender-neutral names/pronouns

What should a reviewer concentrate their feedback on?

- ☐ Do these personas make sense for the project?
- ☐ Are there additional personas/pathways we should add?
- ☐ If you do not relate to any of the personas described and are struggling to figure out how to get involved or use this resource, please leave a comment on issue #403 letting us know what the barriers are!
- ☐ Check for grammar, links.

- **Sam**, who has no GitHub experience
- **Alex**, who has a lot of GitHub experience
- **Amal**, who knows they want to contribute, and does
- **Noor**, who doesn't know they want to contribute, but does

<https://github.com/alan-turing-institute/the-turing-way/pull/421>
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The future



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Book Dashes

- Manchester and London
- 13 selected people to contribute to the book
- 1:3 support ratio:
mentored support to
contribute expertise



[https://github.com/
alan-turing-institute/the-turing-way/
blob/master/
workshops/book-dash/
book-dash-\[mcr|ldn\]-report.md](https://github.com/alan-turing-institute/the-turing-way/blob/master/workshops/book-dash/book-dash-[mcr|ldn]-report.md)

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<https://doi.org/10.5281/zenodo.3238189>



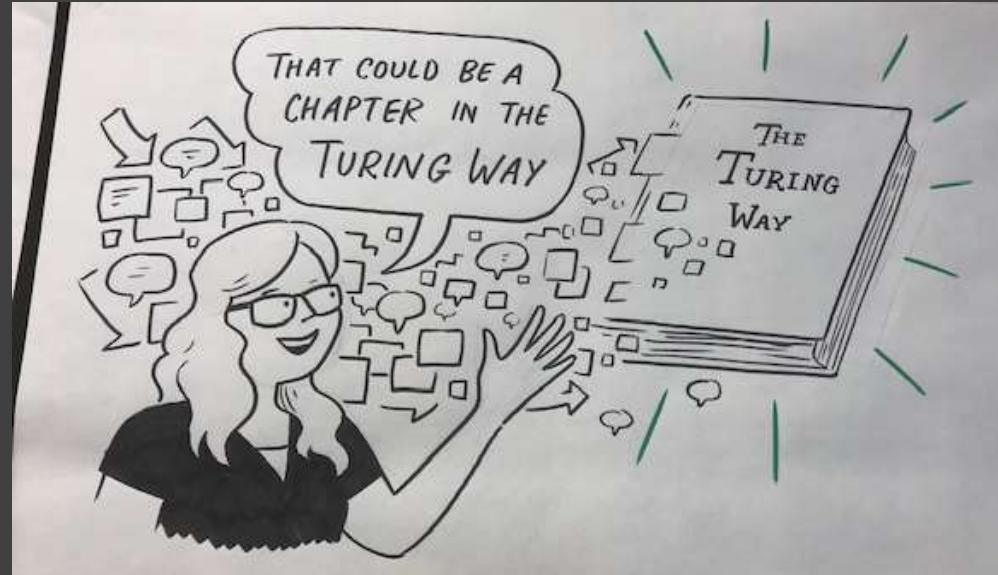
<http://www.scriberia.co.uk>

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<https://doi.org/10.5281/zenodo.3238189>

Funding extension

- Expand the scope to all of data science practices
- Full time community manager, contributions from Turing and beyond



[https://github.com/
alan-turing-institute/the-turing-way/
blob/master/
project_management/
tps-funding-application-20190429.md](https://github.com/alan-turing-institute/the-turing-way/blob/master/project_management/tps-funding-application-20190429.md)

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<https://doi.org/10.5281/zenodo.3238189>

Alex Morley

“I think the coolest part of The Turing Way is the balance it strikes between being authoritative and being an open community-driven project.”



<https://alexmorley.me>
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Carpentries & beyond

- Workshop at CarpentryConnect
- Interactive tutorials
- JOSE papers
- Train the trainers
- Interoperability & reusability at all times



<https://www.software.ac.uk/ccmcr19>
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<https://doi.org/10.5281/zenodo.3238189>

Sharing the responsibility for reproducibility

- **Handbook**, a place to capture knowledge easily
- **Technology**, to make it easy for senior investigators to review code
- **Case studies**, to show that it can be done
- **Checklists**, for researchers, PIs, funders and business team members
- **Community**, to support each other

It takes a village



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Rachael Ainsworth



Becky Arnold



Louise Bowler



Sarah Gibson



Patricia Herterich



James Hetherington



Rosie Higman



Anna Krystalli



Catherine Lawrence



Alex Morley



Martin O'Reilly



Binder Team

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Thank you

The
Alan Turing
Institute



- Book: <https://the-turing-way.netlify.com>
- Newsletter: <https://tinyletter.com/TuringWay>
- GitHub: <https://github.com/alan-turing-institute/the-turing-way>
- Chat: <https://gitter.im/alan-turing-institute/the-turing-way>
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