



Sharing Reproducible Computational Environments with Binder

Sarah Gibson





Matthias Busonnier



Yuvi Panda



Chris Holdgraf



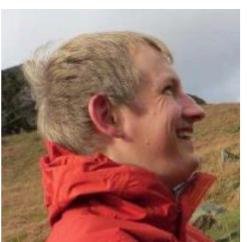
Carol Willing



Simon Li



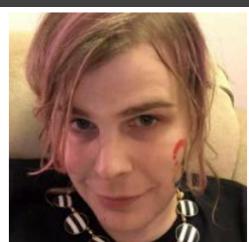
Min Ragan-Kelley



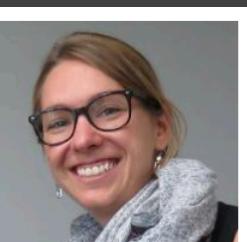
Tim Head



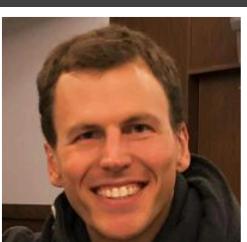
Zach Sailer



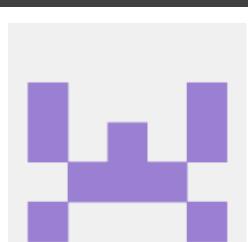
M Pacer



Lindsey Heagy



Erik Sundell



Jessica Forde



Georgiana Dolocan

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doi.org/10.5281/zenodo.3826152

Why should we care?



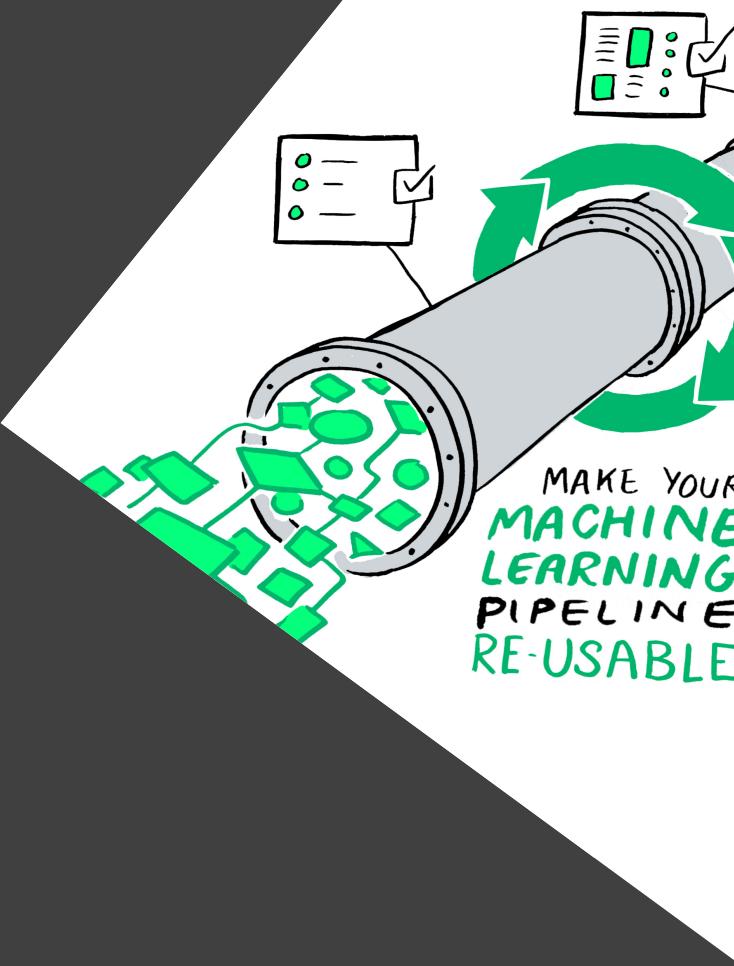
The science is the code

*An article about computational science in a scientific publication is not the scholarship, it is merely advertising of the scholarship. The **actual scholarship** is the complete software development environment and the complete set of instructions which generated the figures.*

Buckheit and Donoho
(paraphrasing John Claerbout)
WaveLab and Reproducible Research, 1995

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What is Reproducibility?



		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable

Kirstie Whitaker's talk at PyData LDN: <https://youtu.be/lG3PcZ6EhiU>

<https://the-turing-way.netlify.com/reproducibility/03/definitions.html> @ReproHack @drsarahlgibson @mybinderteam
doi.org/10.5281/zenodo.3826152

		Data	
		Same	Different
Analysis	Same	Repeatable	Reproducible
	Different		Replicable
		Robust	Generalisable

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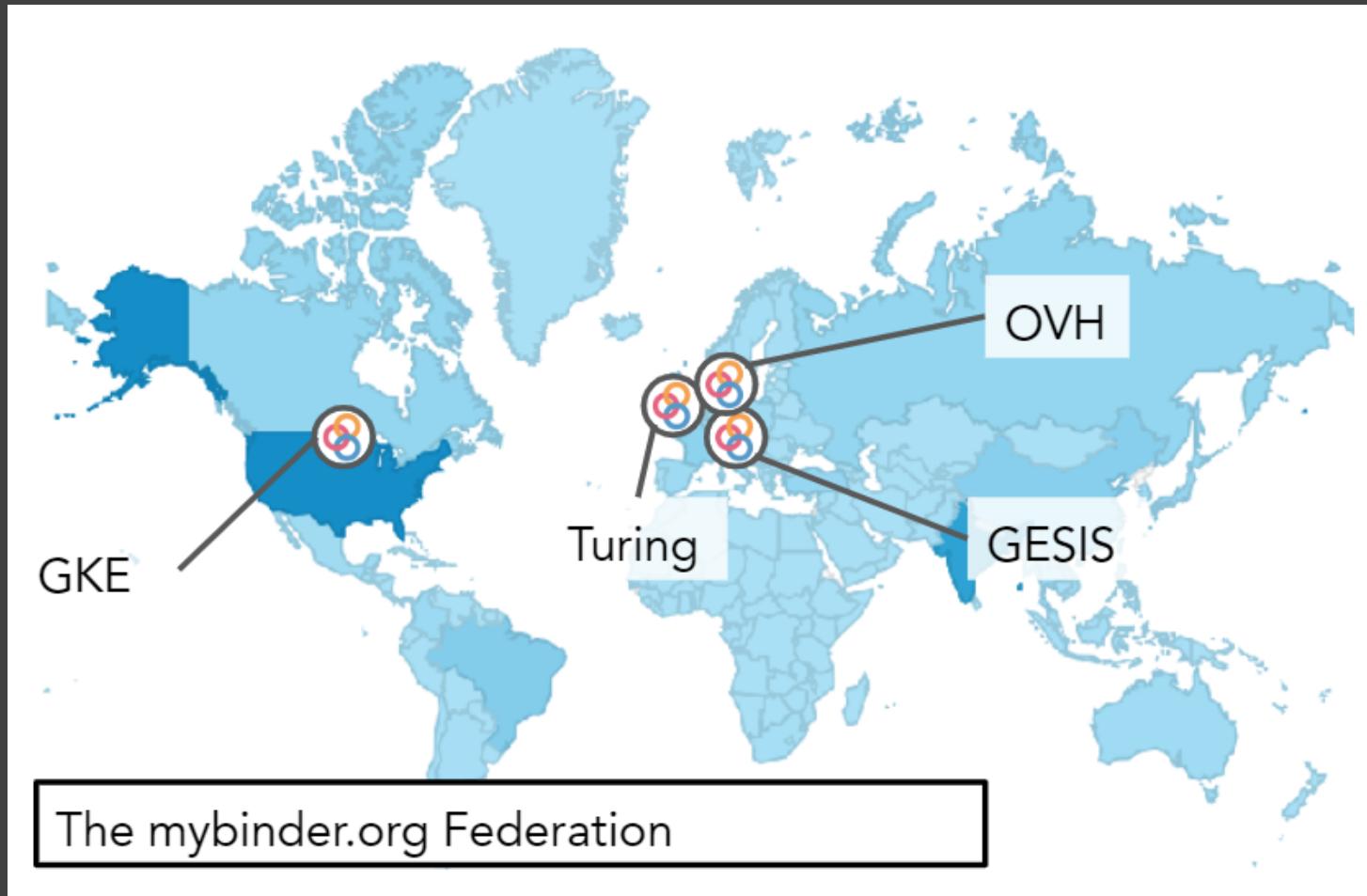
What is Binder?



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doi.org/10.5281/zenodo.3826152

- Project Binder is a global community of data scientists and software engineers dedicated to reproducible research
- The mybinder.org service allows anyone to launch interactive computing environments in the cloud by clicking a link in their browser







mybinder.org

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Security

Insights

Branch: master ▾

[requirements / requirements.txt](#)

Find file Copy path



choldgraf Update requirements.txt

21a328d on 21 Jun

2 contributors



5 lines (3 sloc) | 46 Bytes

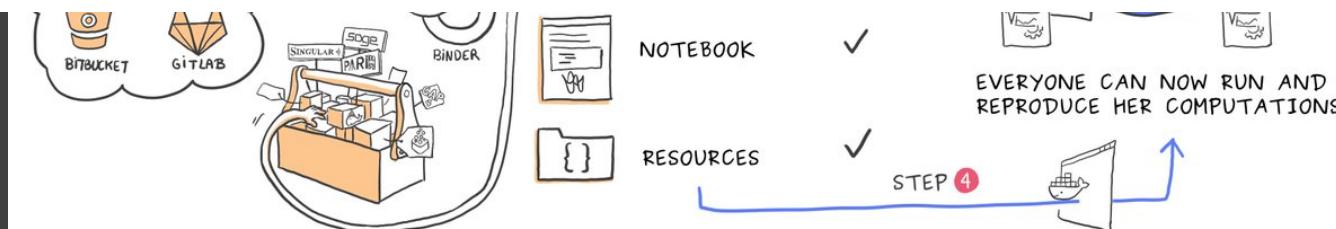
Raw

Blame

History



```
1 numpy==1.16.*  
2 matplotlib==3.*  
3 seaborn==0.8.1  
4
```



[Code](#)[Issues 2](#)[Pull requests 0](#)[Projects 0](#)[Wiki](#)[Security](#)[Insights](#)

Branch: master ▾

[conda / environment.yml](#)[Find file](#) [Copy path](#) betatim Update environment.yml

89dd429 on 11 Dec 2018

4 contributors    

14 lines (13 sloc) | 161 Bytes

[Raw](#)[Blame](#)[History](#)

```
1 name: example-environment
2 channels:
3   - conda-forge
4 dependencies:
5   - numpy
6   - psutil
7   - toolz
8   - matplotlib
9   - dill
10  - pandas
11  - partd
12  - bokeh
13  - dask
```

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Security

Insights

Branch: master ▾

[binder-r-description / DESCRIPTION](#)

Find file Copy path



gedankenstuecke first commit

70f8b8e on 18 Sep 2018

1 contributor

8 lines (7 sloc) | 282 Bytes

Raw

Blame

History



```
1 Package: binderdescription
2 Version: 0.1
3 Date: 2018-09-18
4 Title: Binder R DESCRIPTION support
5 Description: Test that automatically building R packages works
6 Author: Bastian Greshake Tzovaras <bgreshake@googlemail.com>
7 Maintainer: Bastian Greshake Tzovaras <bgreshake@googlemail.com>
```



Courtesy of Juliette Taka

<https://twitter.com/mybinderteam/status/1082556317842264064>

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<doi.org/10.5281/zenodo.3826152>

Code

Issues 3

Pull requests 1

Projects 0

Wiki

Security

Insights

Branch: master ▾

r / install.R

Find file Copy path



betatim Add example Shiny app

8c01f0d on 31 May 2018

4 contributors



6 lines (5 sloc) | 148 Bytes

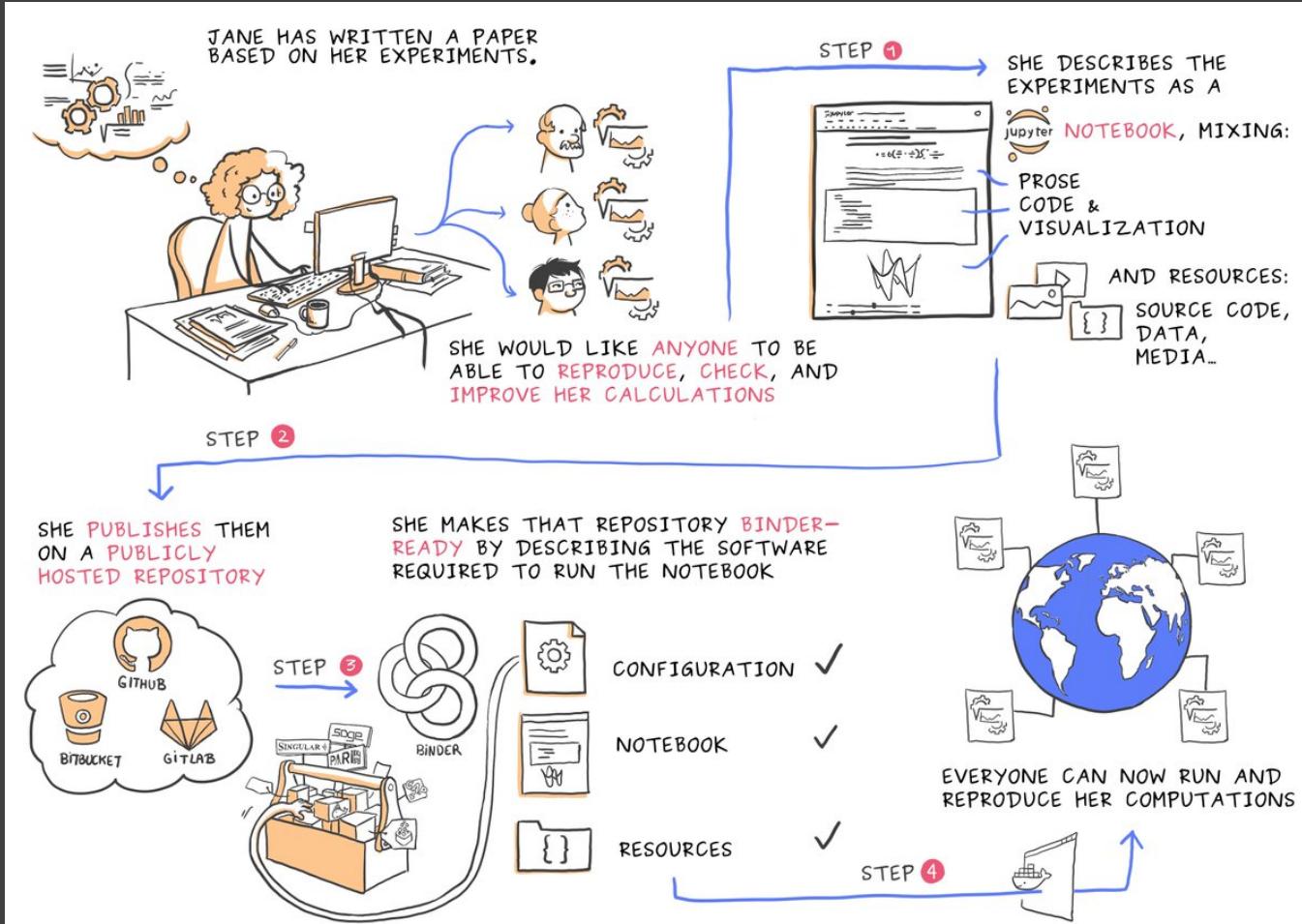
[Raw](#)[Blame](#)[History](#)

```
1 install.packages("tidyverse")
2 install.packages("rmarkdown")
3 install.packages("httr")
4 install.packages("shinydashboard")
5 install.packages('leaflet')
```



Courtesy of Juliette Taka
<https://twitter.com/mybinderteam/status/1082556317842264064>

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<doi.org/10.5281/zenodo.3826152>



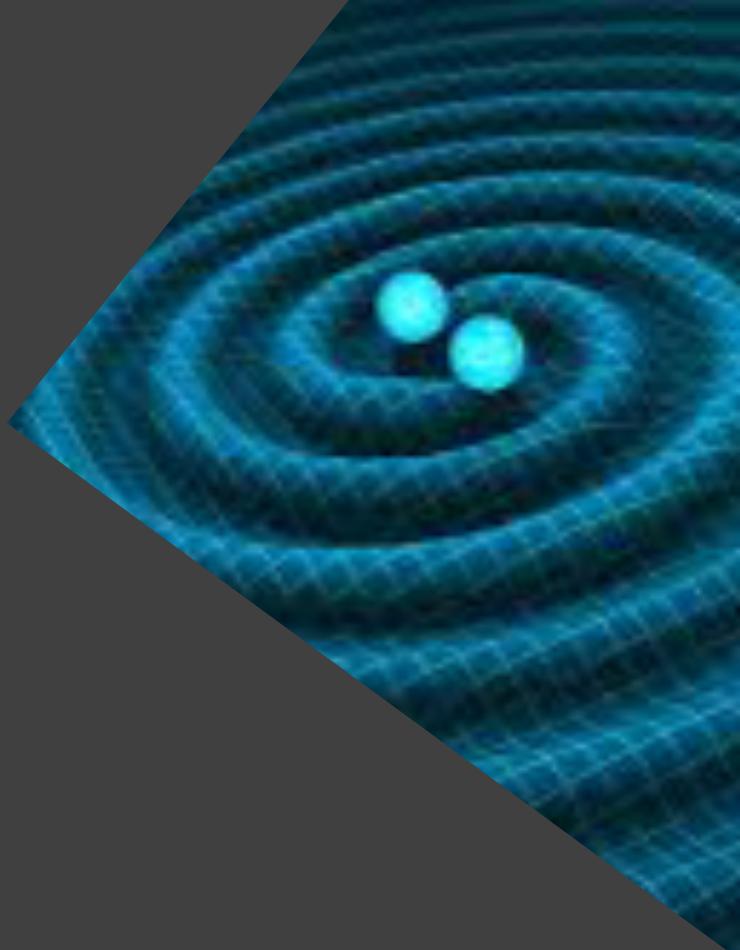
mybinder.org

Courtesy of Juliette Taka

<https://twitter.com/mybinderteam/status/1082556317842264064>

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<doi.org/10.5281/zenodo.3826152>

gw-openscience.org/tutorials/



flickr.com/photos/cwkarl/24984166005

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doi.org/10.5281/zenodo.3826152

Ready, Set, Go!



Ready your Requirements!

Branch: master ▾

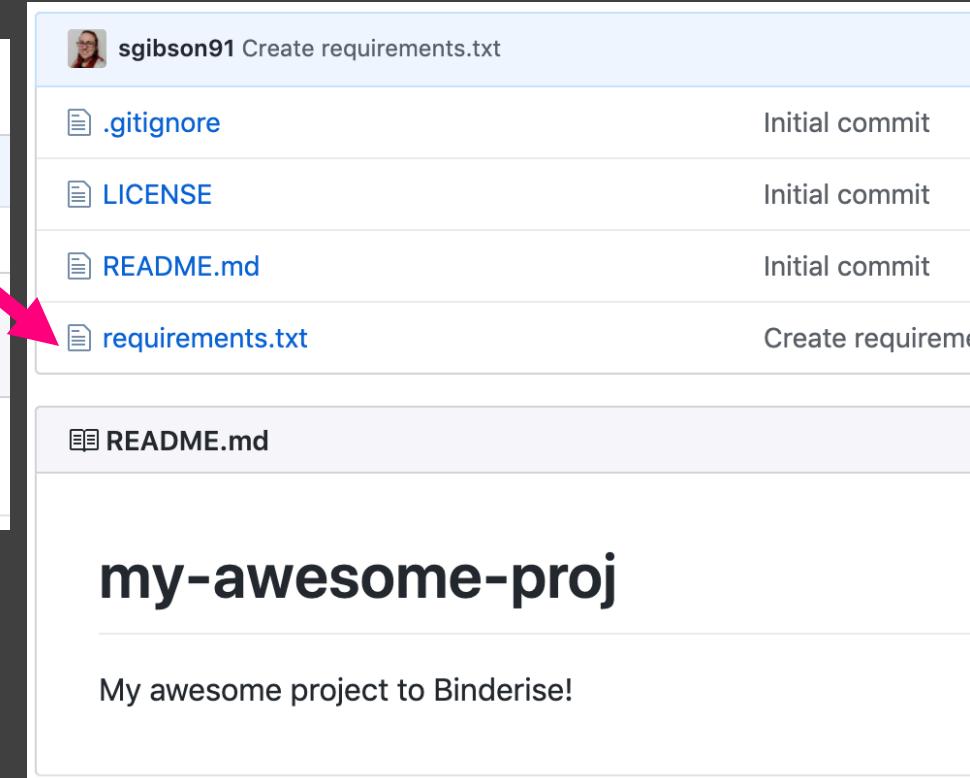
[my-awesome-proj / requirements.txt](#)

sgibson91 Create requirements.txt

1 contributor

3 lines (3 sloc) | 47 Bytes

```
1 numpy==1.16.1
2 pandas==0.24.6
3 matplotlib==3.0.1
```



Set your Binder link

Build and launch a repository

Paste your GitHub URL here

GitHub repository name or URL

GitHub ▾ https://github.com/sgibson91/my-awesome-proj

Git branch, tag, or commit

Path to a notebook file (optional)

Path to a notebook file (optional) File ▾

launch

Copy the URL below and share your Binder with others:

Your Binder link appears here

https://mybinder.org/v2/gh/sgibson91/my-awesome-proj/master

The screenshot shows the Binder web interface. At the top, there's a text input field labeled "GitHub repository name or URL" containing "https://github.com/sgibson91/my-awesome-proj". Below this, there are two optional fields: "Git branch, tag, or commit" and "Path to a notebook file (optional)". To the right of these fields is a "File" dropdown and a large orange "launch" button. Further down, there's a section for sharing the URL, with a text input field containing "https://mybinder.org/v2/gh/sgibson91/my-awesome-proj/master" and a clipboard icon.

Go and launch!

Build and launch a repository

GitHub repository name or URL

GitHub ▾ https://github.com/sgibson91/my-awesome-proj

Git branch, tag, or commit Path to a notebook file (optional)

Git branch, tag, or commit Path to a notebook file (optional) File ▾

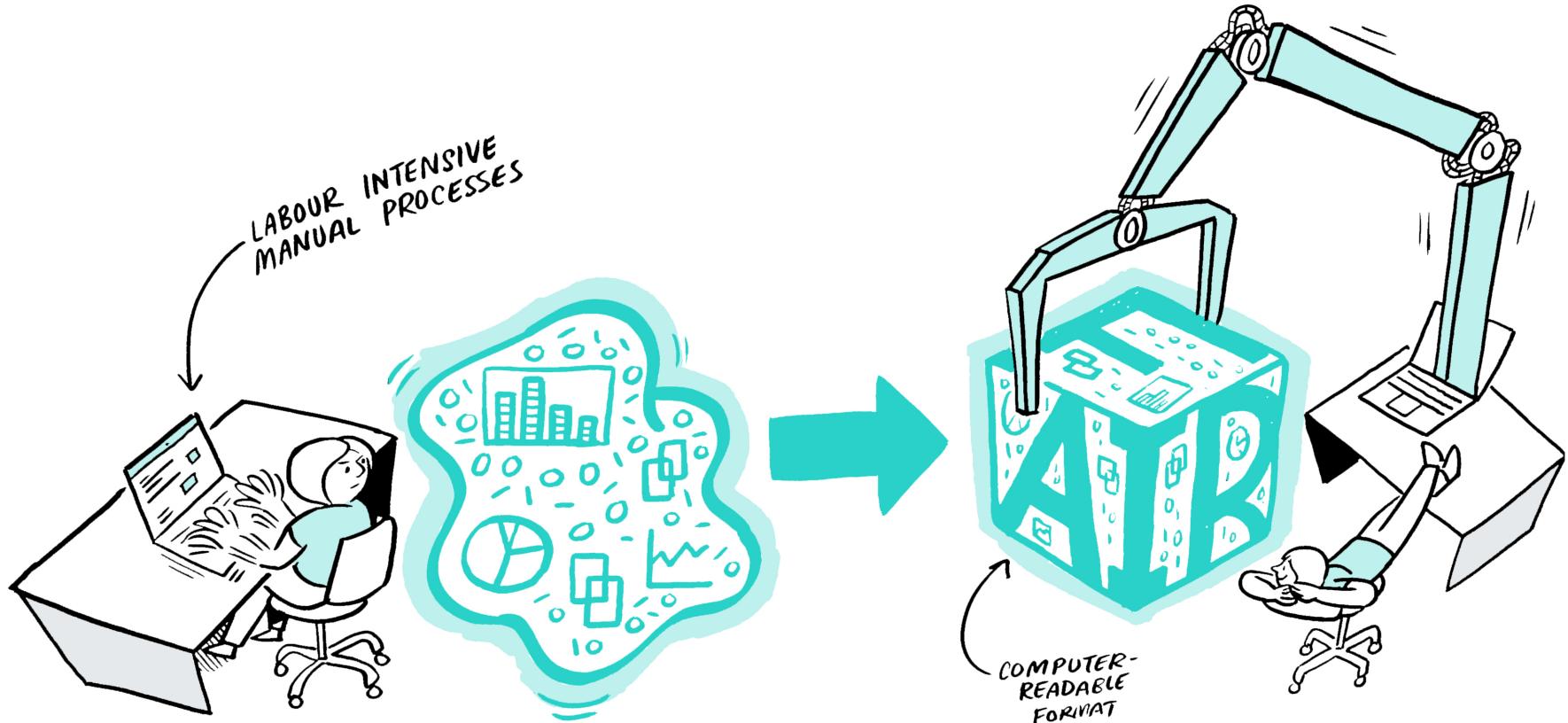
launch

Copy the URL below and share your Binder with others:

https://mybinder.org/v2/gh/sgibson91/my-awesome-proj/master







Thank you!

Learn more about Binder:

- mybinder.readthedocs.io
- discourse.jupyter.org
- bit.ly/zero-to-binder-tutorial

Learn more about reproducibility:

- the-turing-way.netlify.com

The
Alan Turing
Institute



jupyter

binder

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