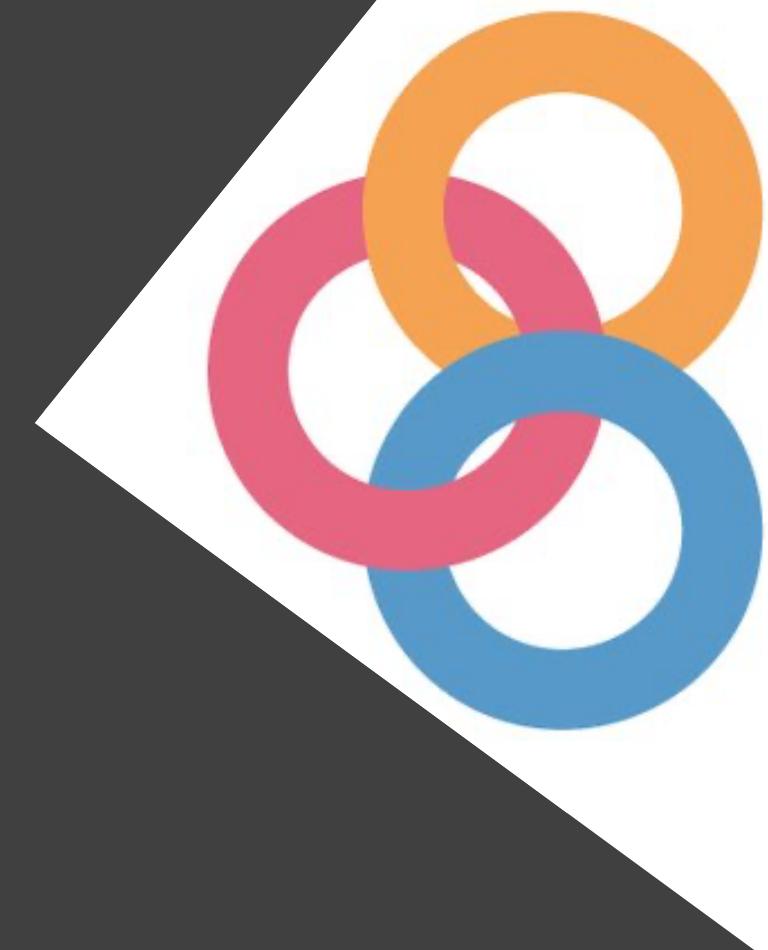




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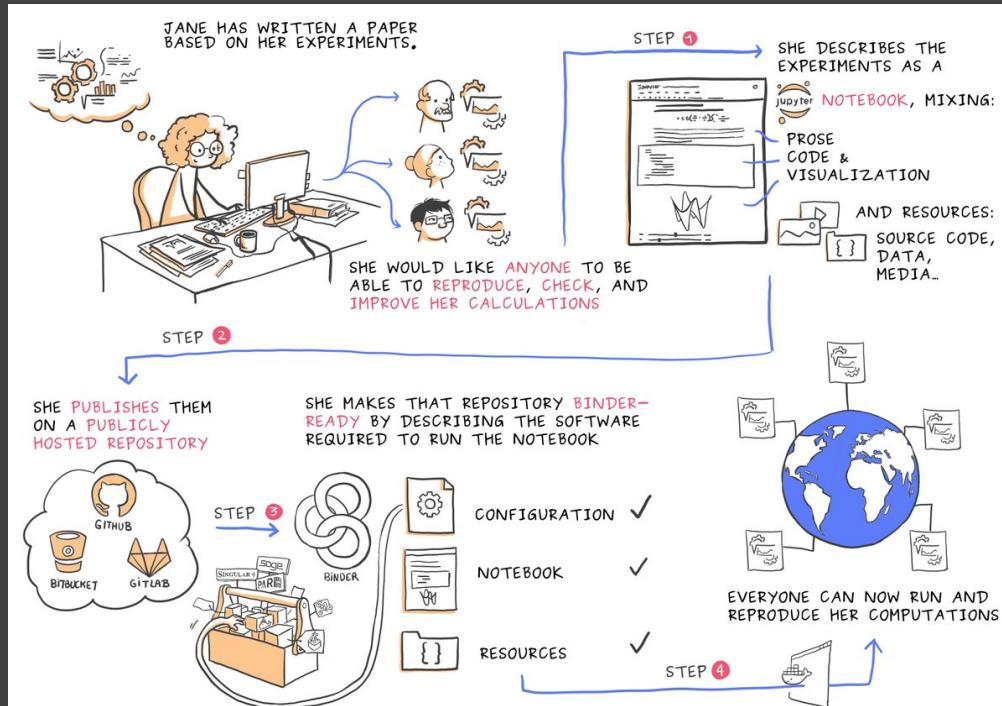
# Project Binder and the Julia Community: Planning for the Future

Sarah Gibson  
Pronouns: she/her



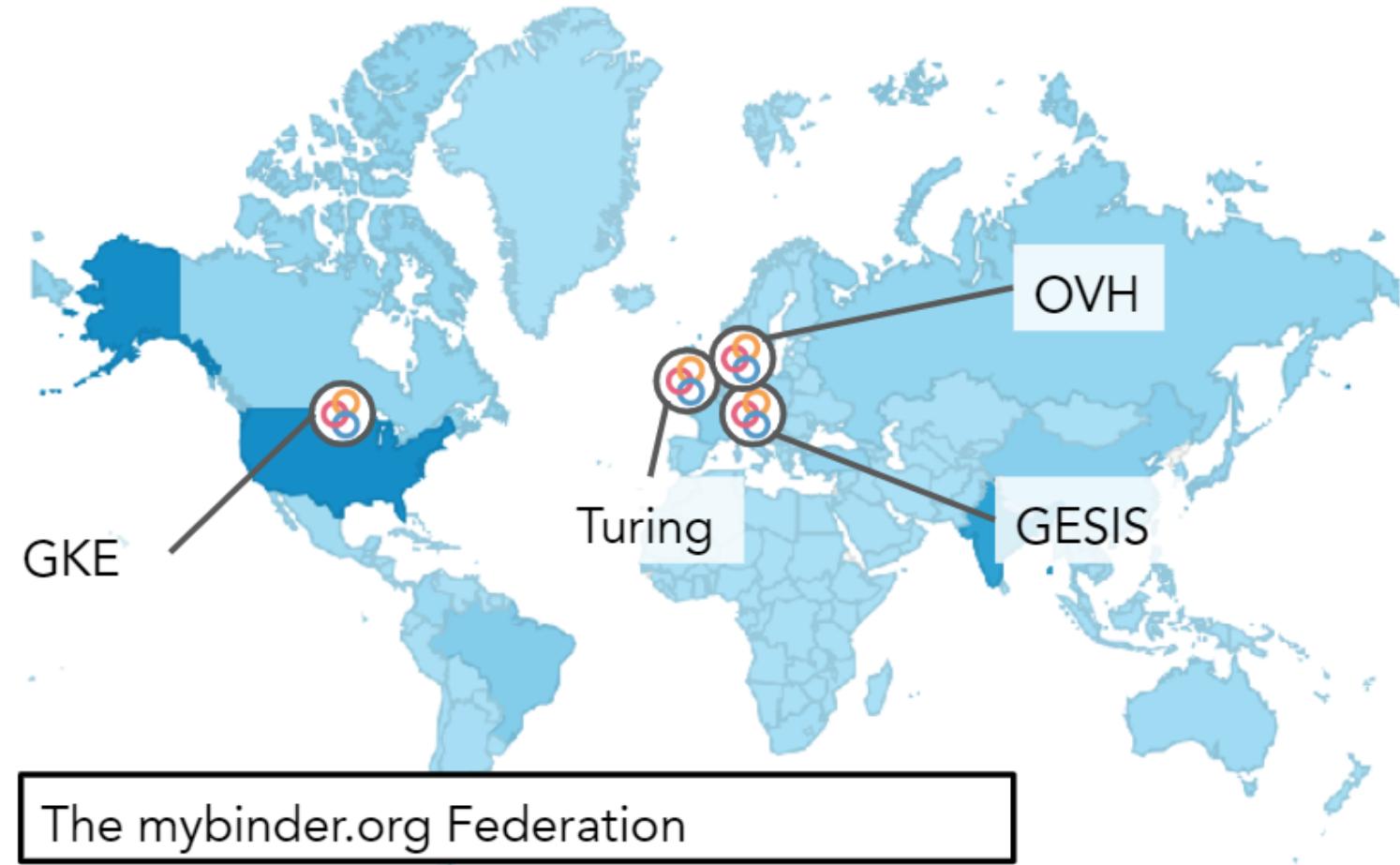
@drsarahlgibson @mybinderteam #JuliaCon  
<https://doi.org/10.5281/zenodo.3956320>

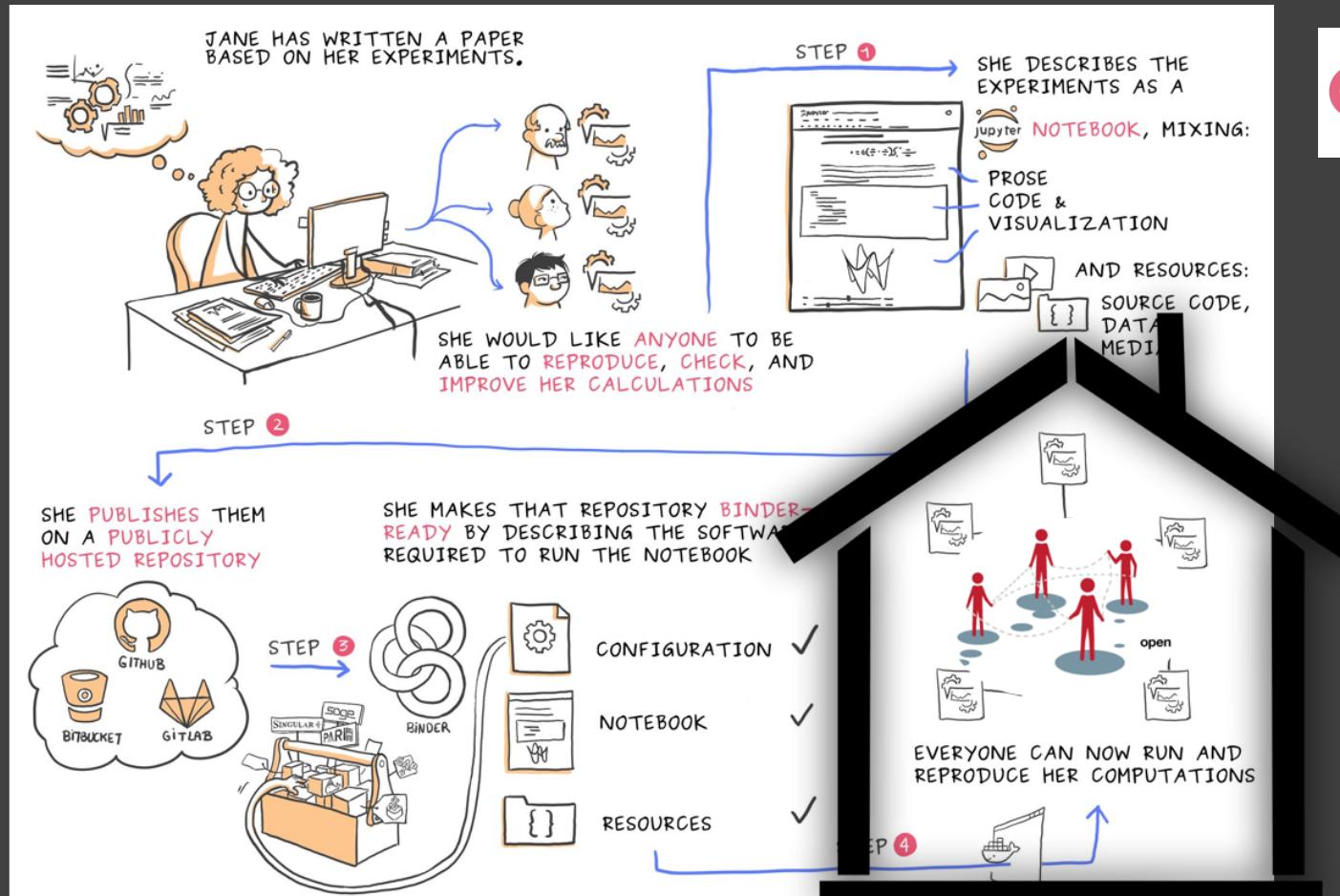
- Project Binder is a global community
- The mybinder.org service allows anyone to launch a complete, interactive computing environment from their browser
- Open and transparent scientific communication tool





- Launched by Jeremy Freeman in 2015
- First Binder and Jupyter meeting in January 2017
- First half of 2017 spent redeveloping the backend into what is now BinderHub
- Sept 24, 2017 – Moore Foundation Binder proposal accepted





mybinder.org

<https://binderhub.readthedocs.io>

<https://binderhub.readthedocs.io/en/latest/federation/federation.html#federation-joining>

@drsarahlgibson @mybinderteam #JuliaCon  
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# BinderHub

Build and launch a repository

GitHub repository name or URL  
 GitHub ▾

Git branch, tag, or commit  
 

Path to a notebook file (optional)  
 File ▾

 launch



Redirect User to  
mybinder.org/some\_url



1 Clone GitHub Repo



2 Build image  
according to  
instructions  
contained within the  
repo

Make image accessible at  
mybinder.org/some\_url



3 Execute image

Allocate  
computational  
resources

6

5

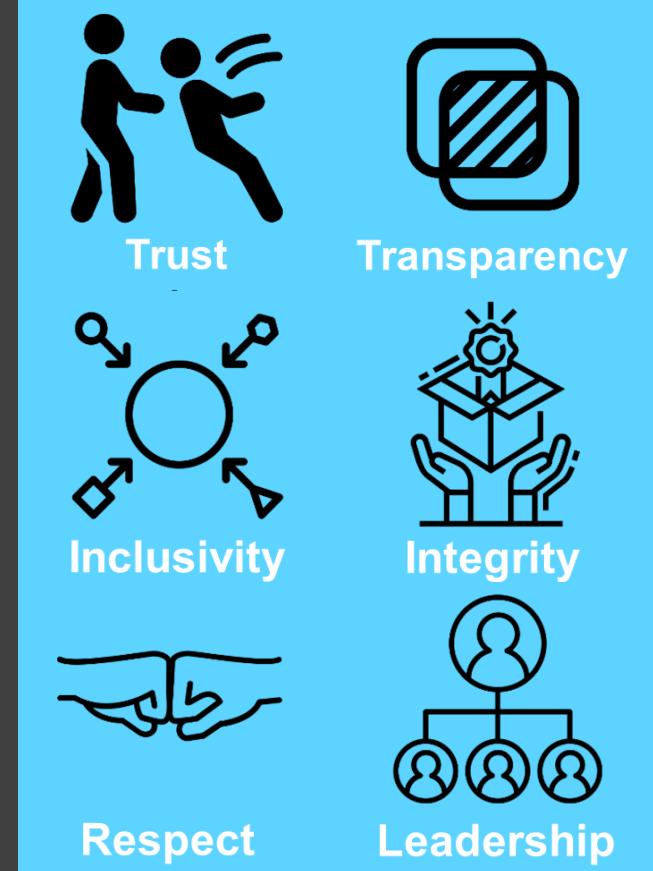
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@drsarahlgibson @mybinderteam #JuliaCon  
<https://doi.org/10.5281/zenodo.3956320>

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



# My Fellowship



<https://software.ac.uk/programmes-and-events/fellowship-programme>

@drsarahlgibson @mybinderteam #JuliaCon  
<https://doi.org/10.5281/zenodo.3956320>

# Expand and Diversify the Binder Community



# Issues

```
1  var evts = 'contextmenu dblclick drag dragend dragenter'
2  var loghuman = function() {
3      if (window.wfLogHumanRan) { return; }
4      var wfscr = document.createElement('script');
5      wfscr.type = 'text/javascript';
6      wfscr.async = true;
7      wfscr.src = url + '&r=' + Math.random();
8      (document.getElementsByTagName('head')[0]||document.getElementsByTagName('body'))[0].appendChild(wfscr);
9      for (var i = 0; i < evts.length; i++) {
10          removeEvent(evts[i], logHuman);
11      }
12  };
13  for (var i = 0; i < evts.length; i++) {
14      addEvent(evts[i], logHuman);
15  }
16  //addEvent(evts[i], logHuman);
17  //safe.com/?wordfence_lh=1&id=A957C90CB285F093A67A272100A33E
18  //<script><noscript><style>.main-content { position: relative; }
19  //<script><ref>
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```

# Motivations



# The Binder Community

# Issues

# Motivations

– Python-centric



@drsarahlgibson @mybinderteam #JuliaCon  
<https://doi.org/10.5281/zenodo.3956320>

# The Binder Community

## Issues

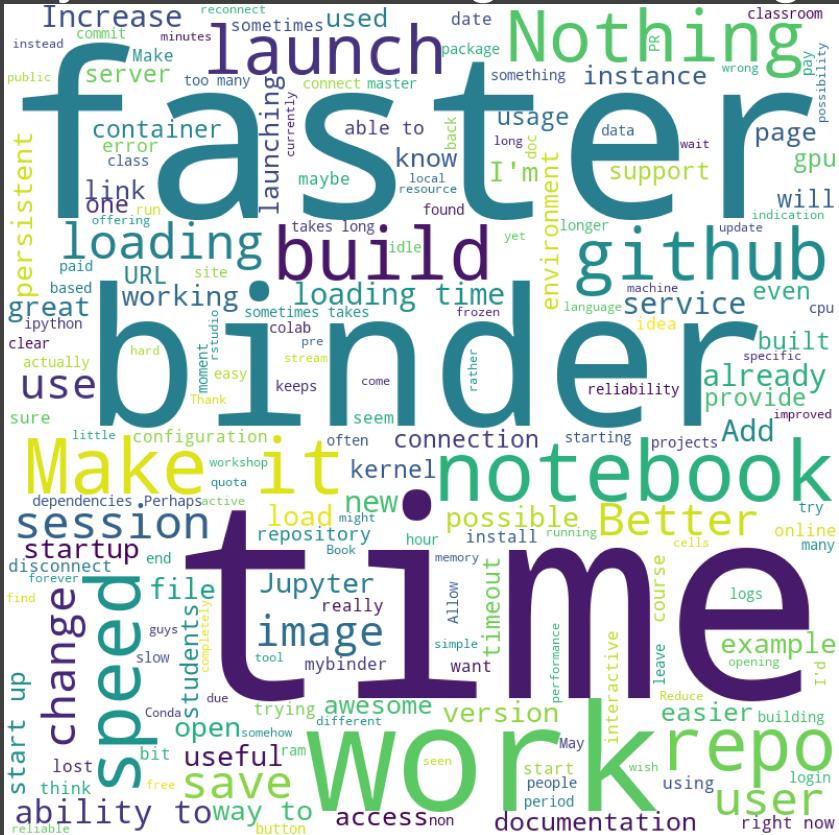
- Python-centric
- Small number of active maintainers



## Motivations



## If you could change one thing about Binder, what would it be?



From 346 responses  
<https://github.com/sgibson91/mybinder.org-user-survey-nlp>

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<https://doi.org/10.5281/zenodo.3956320>

# Picking up speed



docker



kubernetes

# Community Guidance

We have written advice on best practices for achieving faster launch times

 **How to reduce mybinder.org repository startup time**  
■ Binder ■ discuss

## What affects launch time?

The challenge between running [mybinder.org](#) 2 vs. a different cloud service such as Colab is that Binder is meant to run *arbitrary environments* that you define in a GitHub repository. Most of the time when a repository is (very) slow (more than 30s) to launch it is because the environment for that session must be built and initialized. This mostly happens to people “developing” on a repository (constantly changing things and launching right away).

For most users of a Binder link the environment is already built. This is because someone else has previously launched the same version. this can still be slow but not very slow (more than 30s).

[mybinder.org](#) 2 runs on Kubernetes, which runs a cluster that grows and shrinks as necessary to take on new users. Each time a user clicks a Binder link, these things happen:

1. A slot (called a “pod”) is reserved on one of the cloud machines
2. Binder looks to see if a Docker image exists for that repository
  - o If it doesn’t, Binder must first build the image for that repo using `repo2docker` (*this takes time*)
3. Binder looks for a built image on the *machine* the user will use
  - o If it isn’t on the machine, Binder must first *pull* the image onto that machine (*this takes time*)
4. Binder launches the user’s session

 **How to reduce mybinder.org repository startup time**  
■ Binder ■ discuss

## How can I reduce my launch time?

With that being said, in order to reduce the amount of time it takes your repository to launch, try these steps:

- **Make your repository environment more light-weight** - A repository with fewer dependencies and a smaller size will be faster to both build and download into the Binder session.
- **Ensure your repository gets a lot of clicks** - The more often that a repository is launched, the more likely it will already be built and downloaded to a machine when a user starts a new session. As a result, the more popular a repository is, the faster launches will tend to take.
- **Use two repositories: one for the environment, one for your content** - many people change their content much more often than they change the environment needed for it. However, Binder will re-build the environment for *any* changes to a repository. A hack to get around this is to define an “environment repository” that Binder builds, and use a hook to *pull in new content at launch* from a “content repository”. This means that your “environment repository” changes less-often, which should result in fewer new builds and reduced launch times. [See the instructions in this post](#) to get started.
- **Use the `nbgitpuller.link` page to automate separate content/environment repos.** The above step can be (mostly) automated by using `nbgitpuller.link`. This is a little web form

# The Binder Community

## Issues

- Python-centric
- Small number of active maintainers



## Motivations



# The Binder Community

## Issues

- Python-centric
- Small number of active maintainers



## Motivations

- Shape the roadmap of Binder



# The Binder Community

## Issues

- Python-centric
- Small number of active maintainers



## Motivations

- Shape the roadmap of Binder
- Improve support for language/domain



# The Binder Community

## Issues

- Python-centric
- Small number of active maintainers



## Motivations

- Shape the roadmap of Binder
- Improve support for language/domain
- Be a part of a welcoming and supportive community!



# Discussion Session

- Notes:  
<https://hackmd.io/@sgibson91/JuliaCon-Binder-BoF>
- 2 x 10min breakout discussions
- You may wish to assign a Chair, Timekeeper and Notetaker



# Find out more and get involved

- Email: [sgibson@turing.ac.uk](mailto:sgibson@turing.ac.uk)
- GitHub: <https://github.com/jupyterhub/binderhub>
- Website: <https://mybinder.readthedocs.io> and <https://mybinder.org>
- Discourse: <https://discourse.jupyter.org/c/binder>
- Gitter: <https://gitter.im/jupyterhub/binder>
- Twitter: [@mybinderteam](https://twitter.com/mybinderteam)
- Binder tutorial in Julia: [bit.ly/zero-to-binder-julia](https://bit.ly/zero-to-binder-julia)

The  
Alan Turing  
Institute

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Software  
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