

# Making Research Software Findable, Accessible, Interoperable, Reusable (FAIR) with Codefair

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Research Software Developer



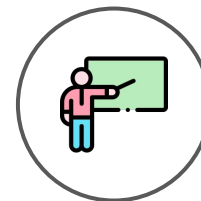
# About This Presentation



15 min + 2 min Q&A



Developers, managers, funders of research software  
(= code files, algorithms, scripts, etc.  
created during the research process)



Learn how to make research software FAIR  
with Codefair



# **Making Software FAIR**

# Making Software FAIR

## FAIR4RS principles

**FAIR Principles for Research Software (FAIR4RS Principles, 2022)**  
**are adaption of the FAIR Principles for research software**

F1. Software is assigned a globally unique and persistent identifier.

How do I assign a unique identifier?

F1.1. Components of the software representing levels of granularity are assigned distinct identifiers.

F1.2. Different versions of the software are assigned distinct identifiers.

F2. Software is described with rich metadata.

What is rich metadata?

F3. Metadata clearly and explicitly include the identifier of the software they describe.

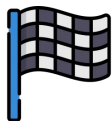
F4. Metadata are FAIR, searchable and indexable.

(and more)

<https://doi.org/10.1038/s41597-022-01710-x>

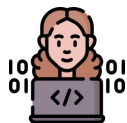
# Making Software FAIR

## FAIR-BioRS: Actionable guidelines for making software FAIR



### Before starting

- Work from a version controlled system platform (e.g. GitHub)
- Select a license and include a LICENSE file



### While developing the software

- Record dependencies
- Maintain a README



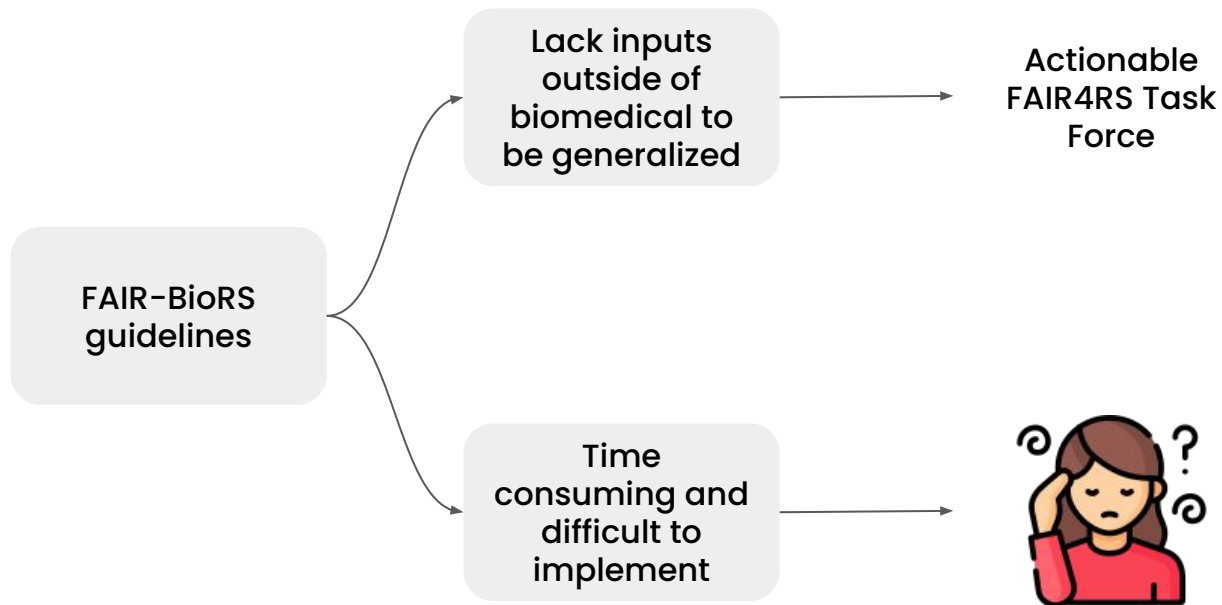
### When releasing a new version

- Include metadata in codemeta.json, CITATION.cff, CHANGELOG
- Archive source code on a DOI-issuing repository like Zenodo

Full guidelines: <https://doi.org/10.1038/s41597-023-02463-x>

# Making Software FAIR

## Challenges





# Codefair

## Overview



Open source and free GitHub app that acts as  
your **personal assistant for making software FAIR**

[codefair.io](https://codefair.io)



# Codefair

Live demo



[Demo repository](#)

# Codefair

## Future work



**Promote Codefair** (currently installed on 560+ repo across 38 users/orgs)



**Add more features to make software FAIR** (README improvement, code formatting, bio.tools registration, etc.)



Include features to support researchers **beyond just FAIR** (software quality, security, etc.)



**Align with the Actionable FAIR4RS guidelines** when they are available

# Codefair

Start making your software FAIR and support us!



## Use

- Install (codefair.io)
- Provide feedback, suggest features
- Star the GitHub repo



## Contribute

- We have Azure credits from Microsoft to run Codefair but **no support for our effort**
- **Contribute features** → Let's collaborate!
- Funding opportunities?

# Thank You!



bpatel@calmi2.org



fairdataihub.org

*Find these slides and  
all resources here*



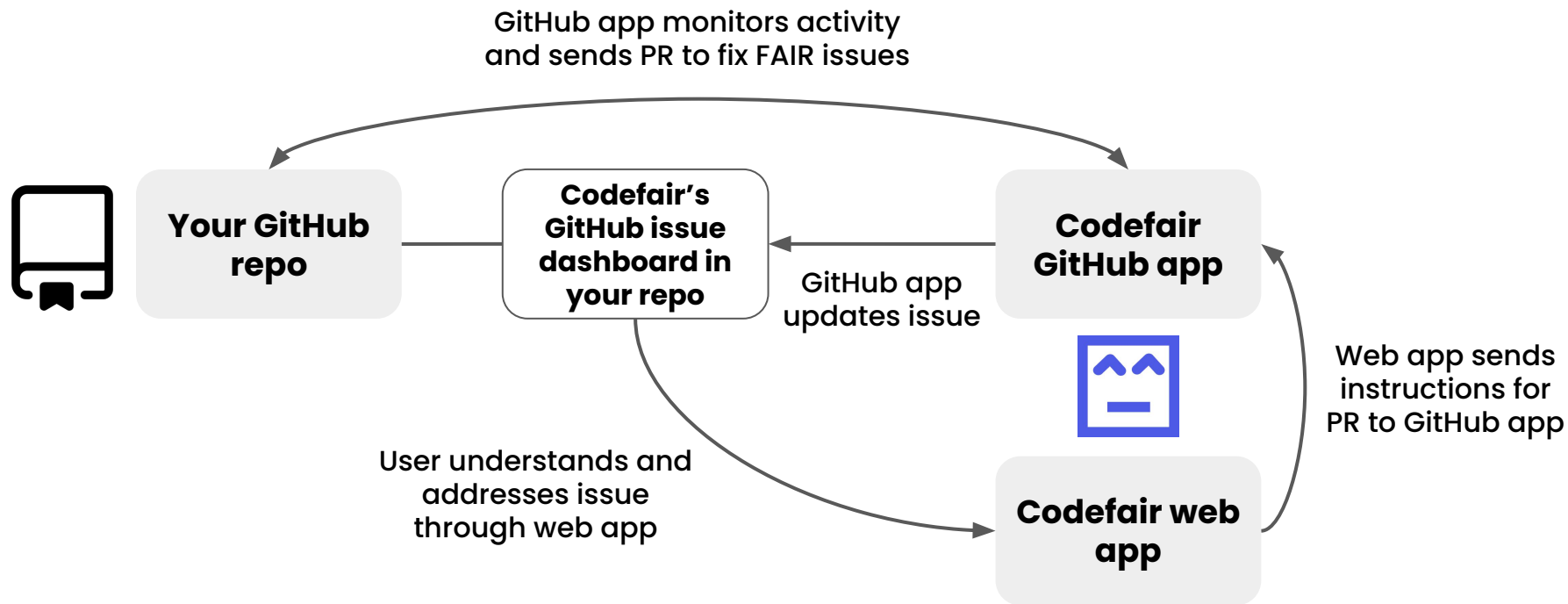
[bit.ly/codefair25](https://bit.ly/codefair25)

*This work is supported by Azure sponsorship credits granted by Microsoft's AI for Good Research Lab*

**Backup slides for live demo**

# Codefair

## Architecture



# Codefair

## Demo

The screenshot shows a GitHub repository interface. At the top, the repository is named 'my-data-analysis-code' under the user 'FAIR-BioRS'. The repository is public. The main navigation bar includes links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. Below this, the repository name is repeated with a 'Public' badge. On the right, there are buttons for 'Edit Pins', 'Watch' (0), 'Fork' (0), and 'Star' (0). The repository has a 'main' branch, 1 branch, and 0 tags. A search bar is present with the text 'Go to file'. A green 'Code' button is visible. The commit history shows a commit by 'bvhpatel' titled 'Update README.md' with 4 commits. The commit details table lists three files: 'LICENSE' (Initial commit, 7 minutes ago), 'README.md' (Update README.md, now), and 'code.py' (Add files via upload, 1 minute ago). The README section is visible, titled 'My data analysis code', with a link to 'codefair.io'. The right sidebar contains an 'About' section with a description 'Repo to demo codefair.io', a list of repository features (Readme, MIT license, Activity, Custom properties), statistics (0 stars, 0 watching, 0 forks), and links for 'Report repository', 'Releases' (No releases published, Create a new release), and 'Packages' (No packages published).

FAIR-BioRS / my-data-analysis-code

Type to search

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

my-data-analysis-code Public

Edit Pins Watch 0 Fork 0 Star 0

main 1 Branch 0 Tags

Go to file

Code

bvhpatel Update README.md f2c121c · now 4 Commits

LICENSE	Initial commit	7 minutes ago
README.md	Update README.md	now
code.py	Add files via upload	1 minute ago

README MIT license

### My data analysis code

Repo to demo [codefair.io](https://codefair.io)

**About**

Repo to demo codefair.io

- Readme
- MIT license
- Activity
- Custom properties

0 stars

0 watching

0 forks

Report repository

**Releases**

No releases published

[Create a new release](#)

**Packages**

No packages published

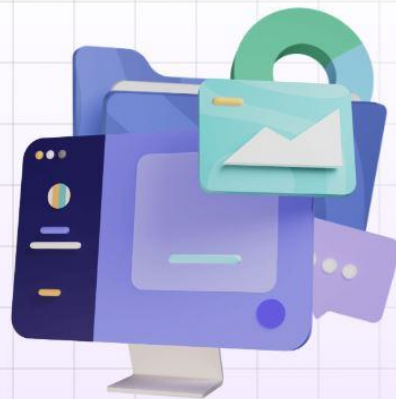
# Codefair

## Demo

[About](#)[FAIR Software](#)[Dashboard](#)

# Make your research software reusable without breaking a sweat!


Let Codefair handle the complexities of making your research software FAIR, so you can focus on what matters most to you.


[Get Codefair →](#)[Read the Documentation](#)



# Codefair

## Demo

 Marketplace / Apps

 **codefair.io** App Add ...

README Transparency

Codefair is your personal assistant for making research software reusable and compliant with the [Findable, Accessible, Interoperable, Reusable \(FAIR\) Principles for Research Software](#). Whether you're developing AI/ML models with Python, data visualization tools with Jupyter, or data analysis code with R, Codefair is here to help.

### Make your research software reusable without breaking a sweat!


By combining a GitHub issue dashboard, a website with intuitive user interfaces, and automated pull request, Codefair ensures your software follows best practices, provides standard metadata, includes a license file, is archived on Zenodo, and more. All you need to do is:

1. Install codefair-app on the GitHub organizations/repositories of your choice (click "Install it for free" below)
2. Code as usual
3. Track FAIR compliance issues through the issue dashboard and address them through the Codefair website

With Codefair by your side, you're not just developing software but you're advocating for better software practices.


### Note

While Codefair is free, installing it via the GitHub Marketplace may still require a credit card to be associated with your (or your organization's) GitHub account. To circumvent this, you can alternatively install Codefair directly from the [app page](#).



### About

Codefair is your personal assistant when it comes to making your research software reusable

By [fairdatahub](#)  40 installs

### Verified

GitHub has verified the publisher's identity, ownership of their domain, and compliance with [other requirements](#).






### Tags

[code-quality](#) [utilities](#)

### Pricing

Basic plan available.

### Resources

-  Support
-  Documentation
-  Privacy Policy
-  Terms of Service
-  Report abuse

# Codefair

## Demo

- Archive
- Logs
- Deleted repositories
- < > Developer settings

✓ Read access to metadata

✓ Read and write access to code, issues, and pull requests

### Repository access

☐ All repositories

This applies to all current and future repositories owned by the resource owner. Also includes public repositories (read-only).

☒ Only select repositories

Select at least one repository. Also includes public repositories (read-only).

Select repositories -

Selected 2 repositories.

FAIR-BioRS/my-data-analysis-code

×

FAIR-BioRS/Hub

×

Save

Cancel

### Danger zone

Suspend your installation

This will block the app access to your resources.

Suspend

Uninstall "codefair.io"

# Codefair Demo

The screenshot shows the GitHub interface for the repository 'FAIR-BioRS / my-data-analysis-code'. The 'Issues' tab is selected, displaying the 'FAIR Compliance Dashboard #1'. The dashboard is a checklist for FAIR software compliance. It includes sections for 'README' (checked), 'LICENSE' (checked), 'Metadata' (unchecked and highlighted with a red box), and 'FAIR Software Release' (unchecked). The 'Metadata' section explains that 'CITATION.cff' and 'codemeta.json' files are required at the root level and provides an 'Add Metadata' button. The right sidebar shows settings for assignees, labels, type, projects, milestone, relationships, development, notifications, and participants.

FAIR-BioRS / my-data-analysis-code

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

## FAIR Compliance Dashboard #1

Edit New issue

codefair-io bot opened now

### Check the FAIRness of your software

This issue is your repository's dashboard for all things FAIR. Keep it open as making and keeping software FAIR is a continuous process that evolves along with the software. You can read the [documentation](#) to learn more.

#### README ✓

A `README.md` file was found at within your repository.

[Edit README](#)

#### LICENSE ✓

A `LICENSE` file is found at the root level of the repository.

[Edit License](#)

#### Metadata ✗

To make your software FAIR, a `CITATION.cff` and `codemeta.json` are expected at the root level of your repository. These files are not found in the repository. If you would like Codefair to add these files, click the "Add metadata" button below to go to our interface for providing metadata and generating these files.

[Add Metadata](#)

#### FAIR Software Release ✗

To make your software FAIR, it is necessary to archive it in an archival repository like Zenodo every time you make a release. When you are ready to make your next release, click the "Create release" button below to easily create a FAIR release where your metadata files are updated (including with a DOI) before creating a GitHub release and archiving it.

[Create Release](#)

Assignees  
No one - [Assign yourself](#)

Labels  
No labels

Type  
No type

Projects  
No projects

Milestone  
No milestone

Relationships  
None yet

Development  
[Code with agent mode](#)

[Create a branch](#) for this issue or link a pull request.

Notifications  
[Subscribe](#)

You're not receiving notifications from this thread.

Participants  
No participants

→ Transfer issue  
📄 Duplicate issue

# Codefair

## Demo

### Edit metadata for [my-data-analysis-code](#)

[Need help?](#)

To make your software FAIR, a CITATION.cff and codemeta.json file are expected at the root level of your repository. They help people discover your software and provide information about your software to them. Provide metadata about your software below and codefair will submit a pull request with a CITATION.cff and codemeta.json file for you.

---

#### > Basic Information

General information of the repository.

Software Name \*

my-data-analysis-code

Description \*

Repo to demo codefair.io

Creation Date

2025-09-30

First Release Date

Select Date

---

#### > Authors and Contributors

Information about the authors and contributors of the software.

Authors \*

Bhavesht Patel

Remove Author

^



# Codefair

## Demo

Default Value

Download URL

Current Version Release Notes


> Additional Information


Additional information about the software.


Development Status

Is Source Code Of

Is Part Of

 Save draft

 Save and push to repository



# Codefair

## Demo

The screenshot displays a GitHub repository for 'FAIR-BioRS / my-data-analysis-code'. A pull request titled 'feat: ✨ Add code metadata files #2' is open, showing a merge of 2 commits from 'code-metadata-0t@gs'. The interface includes navigation tabs for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. Below the pull request header, there are tabs for Conversation, Commits, Checks, and Files changed. The 'Files changed' tab is active, showing a list of changed files: CITATION.cff and codemeta.json. The code for CITATION.cff is displayed, showing a JSON-LD structure with fields like title, authors, affiliation, cff-version, message, type, abstract, keywords, and repository-code. The code for codemeta.json is also shown, displaying a JSON structure with fields like name, context, author, affiliation, familyName, id, givenName, and type.

FAIR-BioRS / my-data-analysis-code

feat: ✨ Add code metadata files #2

codefair-io wants to merge 2 commits into main from code-metadata-0t@gs

Conversation 0 Commits 2 Checks 0 Files changed 2

Changes from all commits File filter Conversations

Filter changed files

CITATION.cff

codemeta.json

14 CITATION.cff



```
@@ -0,0 +1,14 @@
1 + title: my-data-analysis-code
2 + authors:
3 +   - given-names: Bhavesh
4 +     family-names: Patel
5 +     affiliation: California Medical Innovations Institute
6 + cff-version: 1.2.0
7 + message: If you use this software, please cite it using the metadata from this file.
8 + type: software
9 + abstract: Repo to demo codefair.io
10 + keywords:
11 +   - python
12 +   - biomedical
13 + license: MIT
14 + repository-code: https://github.com/FAIR-BioRS/my-data-analysis-code
```










30 codemeta.json







```
@@ -0,0 +1,30 @@
1 + {
2 +   "name": "my-data-analysis-code",
3 +   "@context": "https://w3id.org/codemeta/3.0",
4 +   "author": [
5 +     {
6 +       "affiliation": {
7 +         "name": "California Medical Innovations Institute",
8 +         "type": "Organization"
9 +       },
10 +       "familyName": "Patel",
11 +       "id": "_author_1",
12 +       "givenName": "Bhavesh",
13 +       "type": "Person"
14 +     }
15 +   ]
16 + }
```




# Codefair





## Demo

  FAIR-BioRS / my-data-analysis-code

 Code  Issues 1  Pull requests 1  Actions  Projects  Wiki  Security  Insights  Settings


Type  to search      

FAIR Compliance Dashboard #1   

 codefair-io  opened 5 minutes ago · edited by codefair-io  Contributor 


### Check the FAIRness of your software

This issue is your repository's dashboard for all things FAIR. Keep it open as making and keeping software FAIR is a continuous process that evolves along with the software. You can read the [documentation](#) to learn more.

**README** 


A `README.md` file was found at within your repository.

[Edit README](#)

**LICENSE** 


A `LICENSE` file is found at the root level of the repository.

[Edit License](#)

**Metadata** 

A `CITATION.cff` and `codemeta.json` file are found in the repository. They may need to be updated over time as new people are contributing to the software, etc.


[Edit Metadata](#)

**FAIR Software Release** 


To make your software FAIR, it is necessary to archive it in an archival repository like Zenodo every time you make a release. When you are ready to make your next release, click the "Create release" button below to easily create a FAIR release where your metadata files are updated (including with a DOI) before creating a GitHub release and archiving it.

[Create Release](#)


Additional Recommendations

**Assignees** 


No one - [Assign yourself](#)

**Labels** 


No labels

**Type** 


No type

**Projects** 


No projects



**Milestone** 

No milestone

**Relationships** 


None yet

**Development** 

 Code with agent mode 

[Create a branch](#) for this issue or link a pull request.

**Notifications** [Customize](#)

 [Subscribe](#)




You're not receiving notifications from this thread.

**Participants**

No participants

[Transfer issue](#)

[Duplicate issue](#)

# Codefair

## Demo



Codefair

About

FAIR Software

Dashboard



[Dashboard](#) / [FAIR-BioRS](#) / [my-data-analysis-code](#) / [Release](#) / [Zenodo](#)

## FAIR Software Release

[Need help?](#)

Create a release of your repository on Zenodo. We will also create a Github release and update all referencing DOIs to point to the Zenodo release.

### Required metadata files



#### Confirm License

A license file is required for the repository to be released on Zenodo.

[Review license](#)



The license file was identified as 'MIT'

☐ I have added and reviewed the license file that is required for the repository to be released on Zenodo.



#### Confirm metadata

A code metadata file is required for the repository to be released on Zenodo.

[Review code metadata](#)

Your codemeta.json file is used to generate the title, description, and metadata of your Zenodo deposition. Please make sure that the content of this file is correct and up-to-date.

Codefair will automatically add/update the version number, last modified date, and software identifier before the release so you do not need to worry about them.

☐ I have added and reviewed the citation.CFF and codemeta.json files. I have verified that the content of these files are correct and up-to-date.



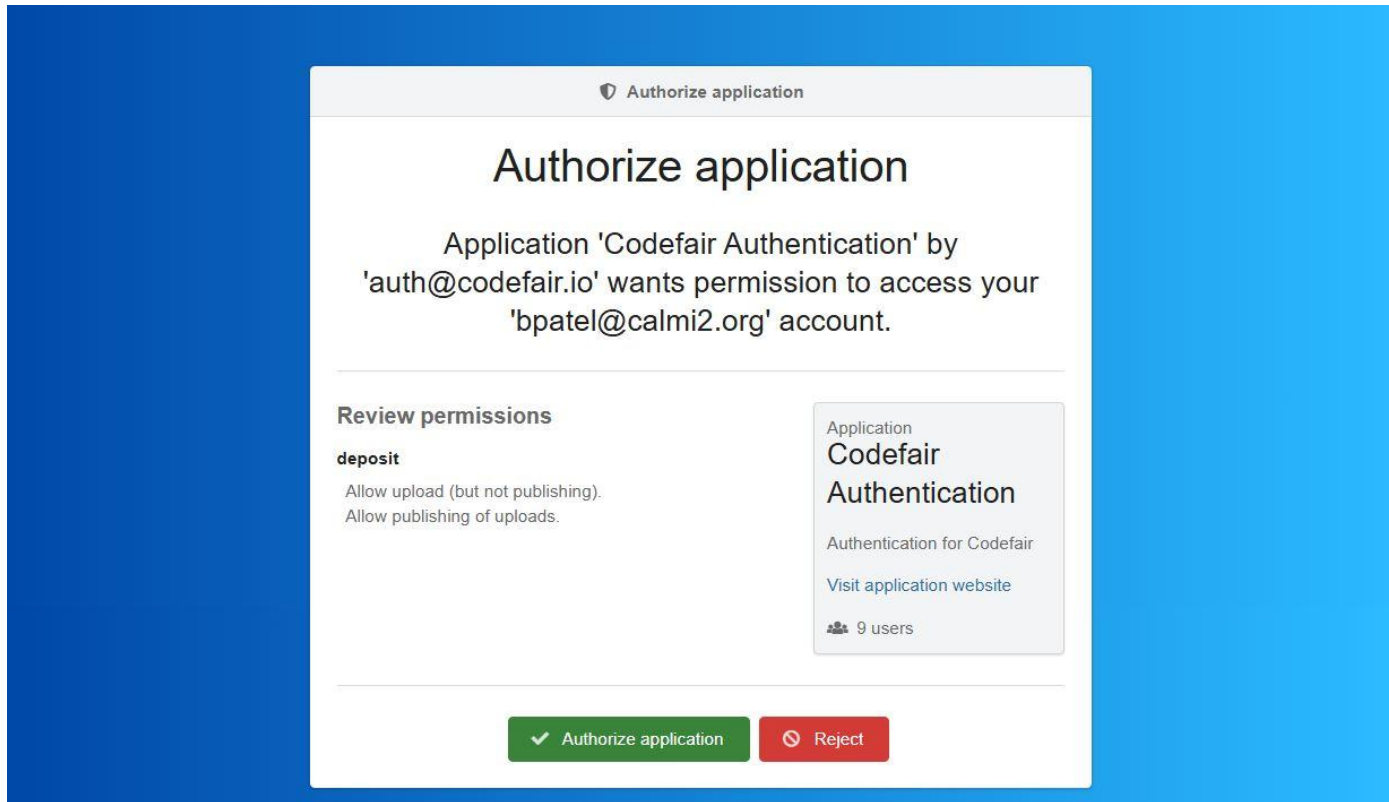
You have not yet confirmed the required metadata files. Please review the license and code metadata files above to continue.





# Codefair

## Demo



# Codefair

## Demo

### Zenodo metadata



#### Provide repository-specific metadata

1 Your `codemeta.json` file is used to generate the title, description, and metadata of your Zenodo deposition. Please make sure that the content of this file is correct and up-to-date. Provide below metadata required by Zenodo but not available in `codemeta.json`.

Version number for this release \*

1.0.0

Access Right \*

- ☒ Open Access
- ☐ Embargoed Access
- ☐ Restricted Access
- ☐ Closed Access

Confirm metadata

### Zenodo release



#### Publish release on Zenodo

You may save the current configuration as a draft and come back to it later.

Save draft

Start the Zenodo publish process




# Codefair

## Demo

Codefair will automatically add metadata to make your software more FAIR. Below is your Zenodo badge. Copy the snippet below and paste it into your README file to display the badge.

☒ I have added and reviewed the

### GitHub release


 **Draft a GitHub release**


GitHub tag \*


v1.0.0

GitHub release \*



v1.0.0

 Please add any additional ex

 Do not publish your Github r

 **Codefair**

With Codefair by your side, you're not just but you are advocating for the developer

reStructuredText 

```
.. image:: https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code
   :target: https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code
```

Markdown 

```
[[[FAIR Software Release](https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code)]](https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code)
```

HTML 

```
<a href="https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code"></a>
```

Image URL 

https://codefair.io/badge/FAIR-BioRS/my-data-analysis-code

Target URL 


https://codefair.io/doi/FAIR-BioRS/my-data-analysis-code

 [View Zenodo Deposition](#)  [View GitHub Release](#)


[Return to Dashboard](#)


the release so you do not need to


correct and up-to-date.

 Github release is not in draft state

you can come back to this page.

[Monitor Codefair service status](#) 

Made with  by the FAIR Data Innovations Hub  
- FAIR Data Innovations Hub. All rights reserved.



# Codefair

## Demo

Open

FAIR Compliance Dashboard #1

Edit Metadata

### FAIR Software Release ✓

v1.0.0 of your software was successfully released on GitHub and archived on Zenodo. You can view the Zenodo archive by clicking the button below:

DOI: 10.5281/zenodo.17238385

Ready to create your next FAIR release? Click the button below:

Create Release

### Additional Recommendations

Although these files aren't part of the core FAIR compliance checks, Codefair recommends including them to improve project governance, community engagement, and contributor experience.

#### CONTRIBUTING.md ✓

This file helps communicate contribution processes and gives contributors clear guidelines placed at the repo root (or in docs/ or github/), saving time and reducing rework. It surfaces automatically on pull requests, issues, and the repository's Contribute page to guide contributors at every step.

Edit CONTRIBUTING

#### CODE\_OF\_CONDUCT.md ✓

Defines clear standards for respectful engagement and shows a welcoming, inclusive community by outlining expectations and procedures for handling abuse. When placed at the repo root (or in docs/ or github/), CODE\_OF\_CONDUCT.md surfaces in the repository's community profile and contributor pages to guide behavior at every step.

Edit CODE OF CONDUCT

Last updated Sep 30 2025, 14:11:06 (timezone: America/Los\_Angeles)

Create sub-issue

Assignees

No one - Assign yourself

Labels

No labels

Type

No type

Projects

No projects

Milestone

No milestone

Relationships

None yet

Development

Code with agent mode

Create a branch for this issue or link a pull request.

Notifications

Subscribe

You're not receiving notifications from this thread.

Participants

No participants

Transfer issue

Duplicate issue

Lock conversation

Pin issue

Delete issue

Add a comment

Write

Preview

H B I @

Use Markdown to format your comment

28