

Codefair: Your Personal Assistant for Developing FAIR Software

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CALIFORNIA MEDICAL
INNOVATIONS INSTITUTE



FAIR DATA
INNOVATIONS HUB

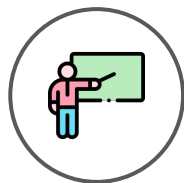
About This Presentation



12 min + 3 min Q&A



Anyone developing, managing,
funding research software



Learn how to make research
software FAIR with Codefair



FAIR

What is FAIR?

FAIR (Findable, Accessible, Interoperable, Reusable) Principles (2016):
High-level instructions to make research outcomes reusable

FAIR Principles for Research Software (FAIR4RS Principles, 2022):

- F1. Software is assigned a globally unique and persistent identifier.
- F2. Software is described with rich metadata.
- Etc.

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

FAIR

How to practically make software FAIR?

FAIR Biomedical Research Software (FAIR-BioRS) Guidelines (2023):
Minimal, actionable guidelines for making software FAIR

- ❑ Include a LICENSE file
- ❑ Include codemeta.json and CITATION.cff metadata files
- ❑ Archive each version of your software, e.g. on Zenodo
- ❑ Etc.

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

FAIR

Challenges for making software FAIR



Lack of awareness/training

What is FAIR? What is a codemeta.json file? What is Zenodo?



Time consuming

For each release, update release date, version number, DOI, authors, etc. in codemeta.json, CITATION.cff, CHANGELOG, archival repository metadata



Codefair

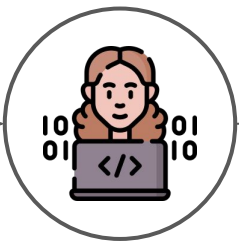
Overview



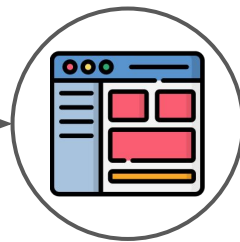
Codefair is a free and open source GitHub app that acts as
your personal assistant for making software FAIR



Install Codefair on your
GitHub repository
(codefair.io)



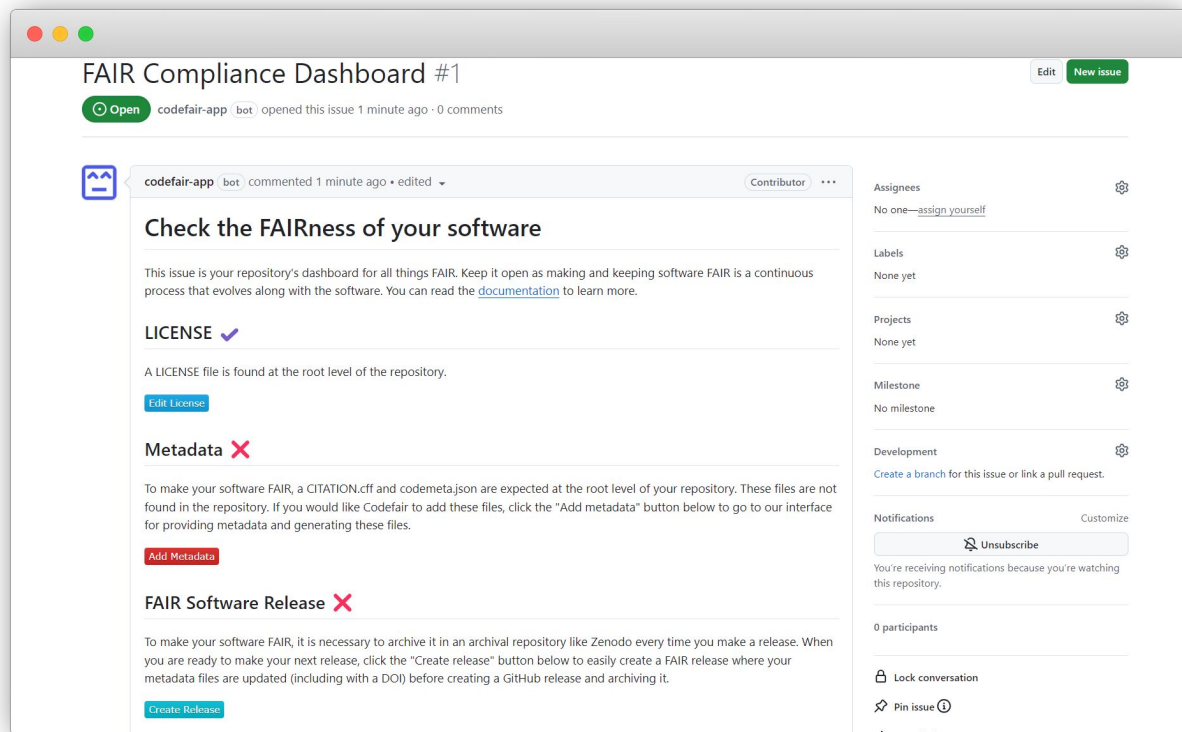
Develop your software
as usual from GitHub



Track and address FAIR
compliance issues
through the GitHub issue

Codefair

GitHub issue dashboard



Codefair

Codefair UI

The screenshot shows a web browser window with the Codefair logo and navigation links (About, FAIR Software, GitHub, Dashboard, Sign Out) at the top. The breadcrumb trail indicates the user is in the 'Edit Code Metadata' section for the repository 'my-awesome-research-software'. The main heading is 'Edit metadata for my-awesome-research-software', with a 'Need help?' link. A paragraph explains that CITATION.cff and codemeta.json files are expected at the root level of the repository. Below this, the 'Basic Information' section is expanded, showing a form with the following fields: 'Software Name' (filled with 'my-awesome-research-software'), 'Description' (filled with 'Awesome software'), 'Creation Date' (filled with '2024-10-14'), and 'First Release Date' (set to 'Select Date'). The 'Authors and Contributors' section is partially visible at the bottom.

Codefair About FAIR Software GitHub Dashboard ^{Open} Sign Out

Dashboard / bvhpatel / my-awesome-research-software / Edit Code Metadata

Edit metadata for [my-awesome-research-software](#) [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-awesome-research-software

Description *
Awesome software

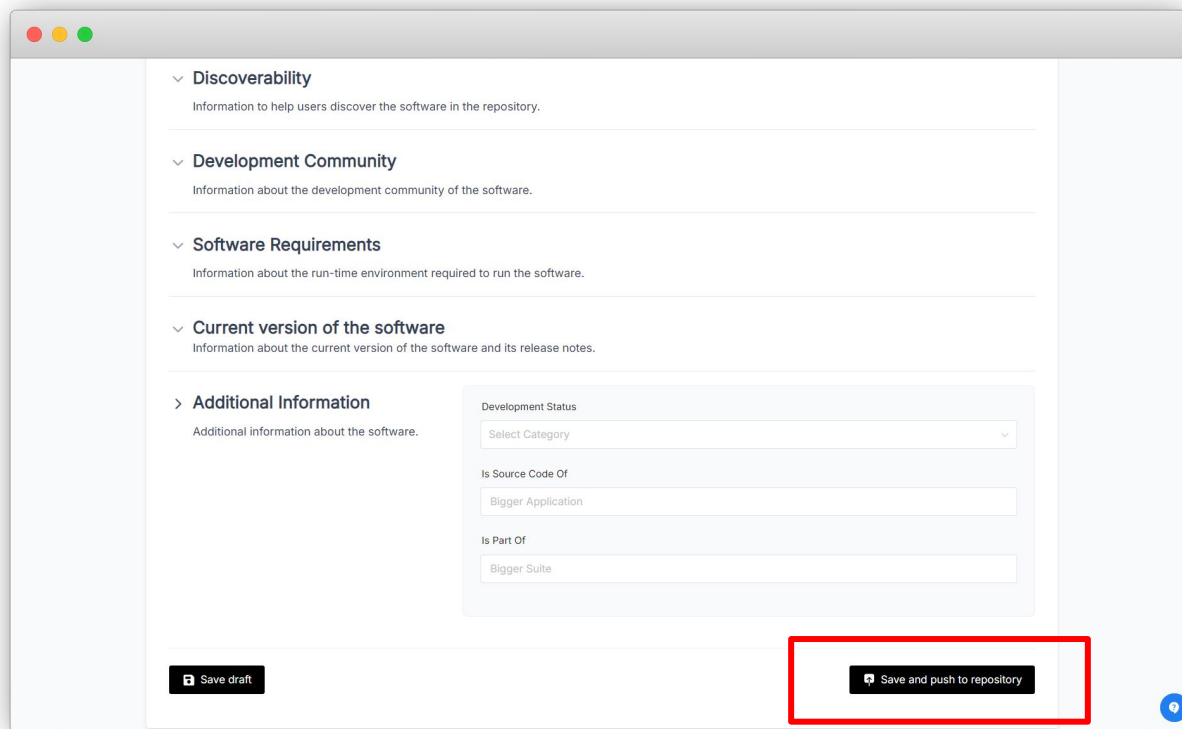
Creation Date
2024-10-14

First Release Date
Select Date

< **Authors and Contributors**
Information about the authors and contributors of the software.

Codefair

Codefair UI



The screenshot displays a web form with a light gray background and a white content area. The form is organized into several sections, each with a dropdown arrow icon to its left. The sections are: 'Discoverability' (Information to help users discover the software in the repository.), 'Development Community' (Information about the development community of the software.), 'Software Requirements' (Information about the run-time environment required to run the software.), and 'Current version of the software' (Information about the current version of the software and its release notes.). Below these is the 'Additional Information' section (Additional information about the software.), which contains a sub-form with three input fields: 'Development Status' (with a dropdown menu showing 'Select Category'), 'Is Source Code Of' (with a text input field containing 'Bigger Application'), and 'Is Part Of' (with a text input field containing 'Bigger Suite'). At the bottom of the form, there are two buttons: 'Save draft' and 'Save and push to repository'. The 'Save and push to repository' button is highlighted with a red rectangular border. A blue circular icon with a question mark is located in the bottom right corner of the form.

Discoverability
Information to help users discover the software in the repository.

Development Community
Information about the development community of the software.

Software Requirements
Information about the run-time environment required to run the software.

Current version of the software
Information about the current version of the software and its release notes.

Additional Information
Additional information about the software.

Development Status
Select Category

Is Source Code Of
Bigger Application

Is Part Of
Bigger Suite

Save draft

Save and push to repository

Codefair

GitHub issue dashboard

The screenshot shows a GitHub issue titled "FAIR Compliance Dashboard #1" created by the "codefair-app" bot. The issue content is a dashboard for repository compliance, divided into three sections: "Check the FAIRness of your software", "LICENSE", and "Metadata". The "Metadata" section is highlighted with a red rectangle. To the right of the issue content is a sidebar with various GitHub issue management options.

FAIR Compliance Dashboard #1 Edit New issue

Open codefair-app [bot] opened this issue 5 minutes ago · 0 comments

codefair-app [bot] commented 5 minutes ago · edited

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.

LICENSE ✓

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

[Edit License](#)

Metadata ✓

A CITATION.cff and a 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](#)

Assignees No one—[assign yourself](#)

Labels None yet

Projects None yet

Milestone No milestone

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

Notifications [Customize](#)

[Unsubscribe](#)

You're receiving notifications because you're watching this repository.

0 participants

[Lock conversation](#)

[Pin issue](#)

Codefair

FAIR Software Release

FAIR Compliance Dashboard #1

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[Contributor](#) • ••

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[Pin issue](#) ⓘ

Codefair

Who should use it?



Anyone developing
research software
(any application in any
field of research)



No knowledge of FAIR
software required



No coding required
(code-free tool)

Codefair

Features



Add/edit LICENSE file



Add/edit codemeta.json and CITATION.CFF metadata files



Create FAIR release via Zenodo



Validate Common Workflow Language (CWL) files



Codefair dashboard



Enhance existing features (e.g., add Figshare, Software Heritage)



Support additional metadata files (CHANGELOG, CONTRIBUTING, etc.)



Integration with linting and other code improvement tools



LLM integration to improve README, metadata, and more



Expand Codefair beyond GitHub (e.g., GitLab)



Supporting Codefair

Supporting Codefair

Many ways!



Use

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



Contribute

- No development support (this is a side project) → we can use your help!
- Developer documentation: docs.codefair.io



Fund

- Any funding opportunities?
- Let's collaborate!

Supporting Codefair

Many ways!

Join our Research Software Alliance (ReSA) task force
for developing actionable guidelines for making any software FAIR



www.researchsoft.org/taskforces

Email me to join the task force: bpatel@calmi2.org

Thank You!



codefair.io



bpatel@calmi2.org



fairdataihub.org

*Find these slides and
all resources here*



bit.ly/codefairUSRSE2024