Presenting the Actionable Guidelines for FAIR Research Software Task Force

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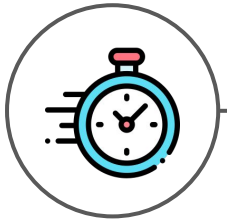
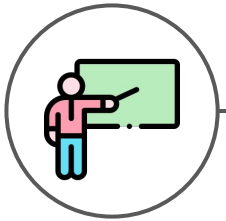
About This Presentation



15 min + 2 min Q&A

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



Learn about the Actionable FAIR4RS Task Force

Making Software FAIR

FAIR = Findable, Accessible, Interoperable, Reusable

Making Software FAIR

FAIR principles

The FAIR (Findable, Accessible, Interoperable, Reusable) principles (2016) are high-level instructions to make research outcomes reusable

Widely adopted across fields of research and by all stakeholders including researchers, funders, and scientific publishers

https://doi.org/10.1038/sdata.2016.18

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.
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.
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

The FAIR4RS principles are being broadly adopted

Many policies require compliance with the FAIR4RS principles
(e.g., Open Research Funders Group)

Grants for supporting compliance are available
(e.g., German Research Council - DFG)

Infrastructure are being build for enabling compliance
(e.g., FAIR-IMPACT FAIR Metrics, CodeMeta)

https://www.researchsoft.org/blog/2024-03

Making Software FAIR
Problem

The FAIR4RS principles, by design,
do not provide actionable instructions

F1. Software is assigned a globally unique and persistent 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.
F3. Metadata clearly and explicitly include the identifier of the software they describe.
F4. Metadata are FAIR, searchable and indexable.

How do I assign a unique identifier?

What is rich metadata?

FAIR-BioRS Guidelines

FAIR-BioRS Guidelines

About

FAIR Biomedical Research Software (FAIR-BioRS) Guidelines (2023)

Minimal, actionable, step-by-step guidelines for complying with each of the FAIR4RS principles

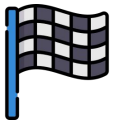
Literature review

Inputs from the biomedical research community

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

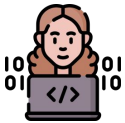
FAIR-BioRS Guidelines

Snapshot



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

FAIR-BioRS Guidelines

Limitations

The FAIR-BioRS guidelines were developed only through inputs from the biomedical research community so they cannot be generalized as is

The 2 year survey of the FAIR4RS principles highlights the need for generalized actionable guidelines

https://doi.org/10.5281/zenodo.15381365

Actionable FAIR4RS Task Force

Actionable FAIR4RS Task Force

Background

The Actionable Guidelines for FAIR Research Software Task Force started in December 2024 under the Research Software Alliance (ReSA)

Establish actionable guidelines (i.e. guidelines that provide practical steps) to make any research software FAIR in line with the FAIR4RS principles

https://www.researchsoft.org/tf-actionable-fair4rs

Actionable FAIR4RS Task Force

New challenges compared to the FAIR-BioRS effort

How to develop domain-agnostic guidelines?

How to address open vs closed source software?

How to keep up with evolving standards?

Actionable FAIR4RS Task Force

Members

~12 active members

Various geographical locations (USA, Canada, Germany, Spain, UK, Netherland, etc.)

Various research domains (Biomedical, Data Science, Knowledge Representation, etc.)

Email me to join! bpatel@calmi2.org

Progress

Progress

Task 1: Understanding the FAIR4RS principles

Studied the 17 principles → **Identified main requirements** → **Had many questions!**

We identified 6 categories where actionable guidelines are needed to comply with the FAIR4RS principles:

C1. Identifier

C2. Metadata for software publication & discovery

C3. Standards for inputs & outputs

C4. Qualified references

C5. Metadata for software reuse

C6. License

Progress

Task 2: Addressing questions from the 6 categories

Subgroups of 2 to 5 members are investigating the questions of each category through three main approaches

Literature review

Personal assessment

External feedback

Everything is tracked through our repo's GitHub issues:
https://github.com/researchsoft/Actionable-FAIR4RS/issues

Progress

Subgroup for category C5 “Metadata for software reuse”

Two FAIR4RS principles

- R1. Software is described with a plurality of accurate and relevant attributes
- R1.2. Software is associated with detailed provenance.

Two main questions

- What provenance and other metadata are necessary for software reuse?
- How to provide that metadata?

Preliminary findings

Provenance metadata:

- Authors info
- Funding details

Other metadata

- Software description
- Required dependencies

How to provide: codemeta.json

Progress

Subgroup for category C3 “Standards for inputs & outputs”

Need to hear from you about how the research software you develop read, write, and exchange data

Survey (6-8 min)

http://bit.ly/48e4OvA

Progress
Timeline

December 2025
Complete sub-groups investigations

March 2026
Release first draft of the guidelines for community feedback

Summer 2026
Publish first version of the guidelines

Fall 2026
Maintain guidelines

https://www.researchsoft.org/tf-actionable-fair4rs

Stop by my poster today to discuss!

Thank You!

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fairdataihub.org

Find these slides and all resources here

bit.ly/a-FAIR4RS