Les principes FAIR pour les logiciels de recherche

Recommandation FAIR4RS

Service des **bibliothèques**
Université de Strasbourg

RDA
RESEARCH DATA ALLIANCE

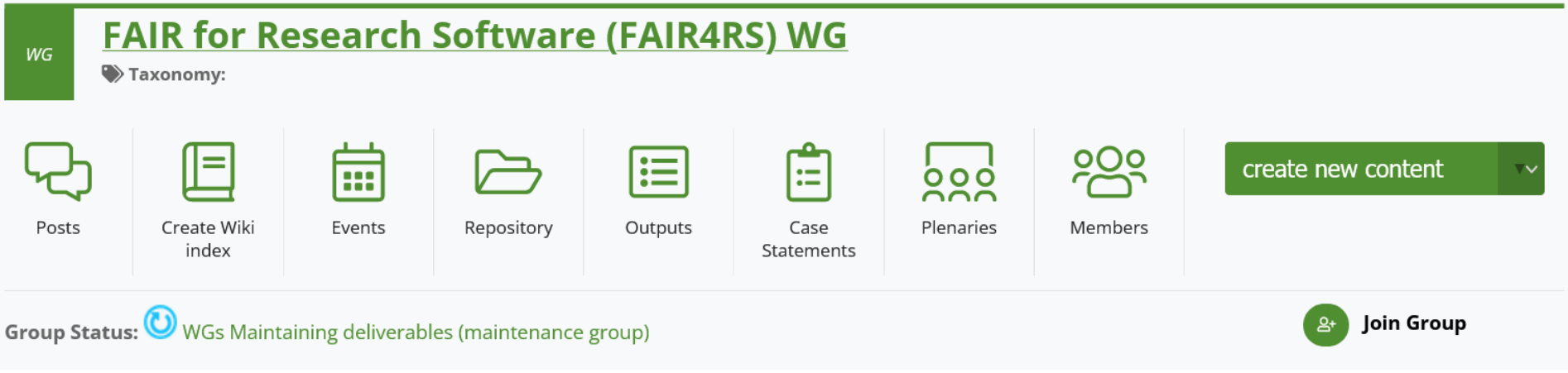
Stéphanie Cheviron, 01/12/2022

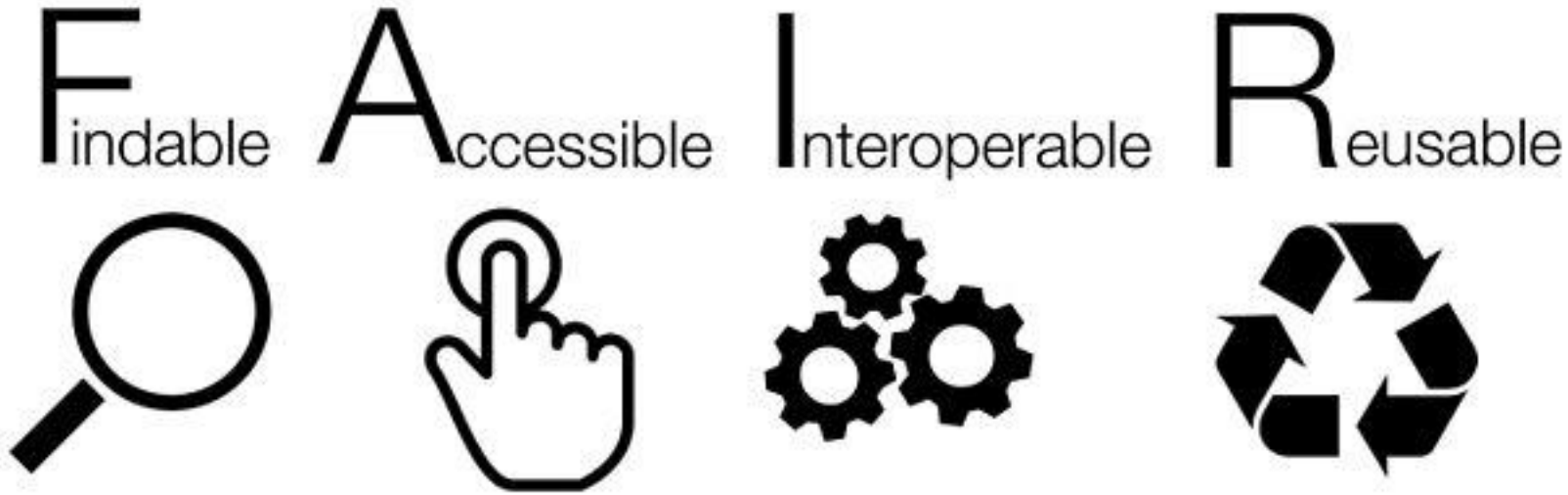
Le **WG FAIR4RS** (2020-2022) piloté par la RDA, FORCE11 et la **Research Software Alliance (ReSA)** a rassemblé une communauté **pour réviser et étendre les principes FAIR aux logiciels de recherche.**

RDA Endorsed Recommendations

FAIR Principles for Research Software (FAIR4RS Principles)

https://doi.org/10.15497/RDA00068





The FAIR Guiding Principles for scientific data management and stewardship

http://dx.doi.org/10.1038/sdata.2016.18

Définition du logiciel de recherche (Gruenpeter et al., 2021) :

Research Software *includes source code files, algorithms, scripts, computational workflows and executables that were* ***created during the research process or for a research purpose****.*

Software components *(e.g., operating systems, libraries, dependencies, packages, scripts, etc.) that are used for research but were not created during or with a clear research intent* ***should be considered software in research*** *and not Research Software.*

This differentiation may vary between disciplines.

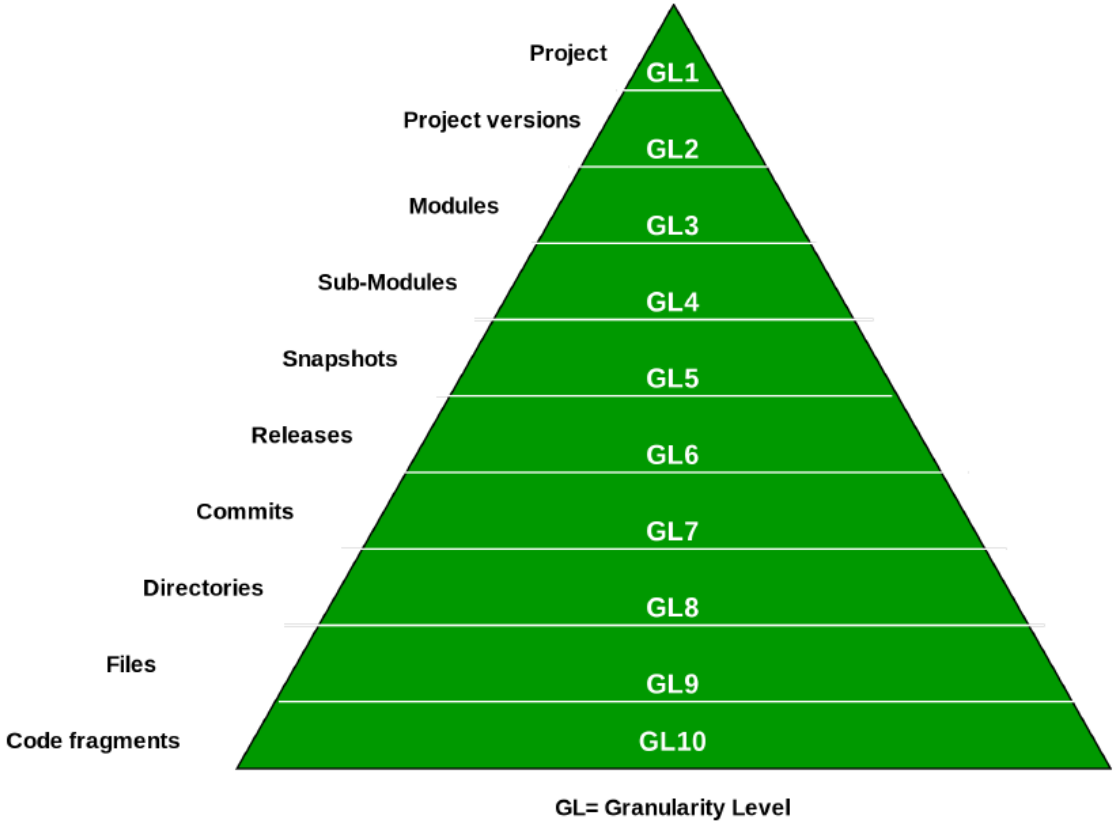


Figure 1: Granularity levels for software as identified by the RDA/FORCE11 Software Source Code Identifiers WG (RDA/FORCE11 SSCID WG et al., 2020)

F
I
N
D
A
B
L
E

FAIR Guiding Principles (2016)

The first step in (re)using data is to find them.

Metadata and data should be easy to find for both humans and computers.

Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the FAIRification process.

FAIR4RS Principles (2022)

Software, and its associated metadata, is easy for both humans and machines to find.

FINDABLE

FAIR Guiding Principles (2016)

F1. (Meta)data are assigned a globally unique and persistent identifier

FAIR4RS Principles (2022)

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.

FINDABLE

FAIR Guiding Principles (2016)

F2. Data are described with rich metadata (defined by R1 below)

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

F4. (Meta)data are registered or indexed in a searchable resource

FAIR4RS Principles (2022)

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.

A C C E S S I B L E

FAIR Guiding Principles (2016)

Once the user finds the required data, she/he needs to know how can they be accessed, possibly including authentication and authorisation.

FAIR4RS Principles (2022)

Software, and its metadata, is retrievable via standardized protocols.

ACCESSIBLE

FAIR Guiding Principles (2016)

A1. (Meta)data are retrievable by their identifier using a standardized communications protocol

A1.1. The protocol is open, free, and universally implementable

A1.2. The protocol allows for an authentication and authorization procedure, where necessary

FAIR4RS Principles (2022)

A1. Software is retrievable by its identifier using a standardized communications protocol.

A1.1. The protocol is open, free, and universally implementable.

A1.2. The protocol allows for an authentication and authorization procedure, where necessary.

ACCESSIBLE

FAIR Guiding Principles (2016)

A2. Metadata are accessible, even when the data are no longer available

FAIR4RS Principles (2022)

A2. Metadata are accessible, even when the software is no longer available.

INTEROPERABLE

FAIR Guiding Principles (2016)

The data usually needs to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

FAIR4RS Principles (2022)

Software interoperates with other software **by exchanging data and/or metadata**, and/or through interaction via application programming interfaces (APIs), described through standards.

INTEROPERABLE

FAIR Guiding Principles (2016)

I1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.

I2. (Meta)data use vocabularies that follow FAIR principles

I3. (Meta)data include qualified references to other (meta)data

FAIR4RS Principles (2022)

I1. Software **reads, writes and exchanges data** in a way that meets domain-relevant community standards.

*Now split between **F4** and **I1**.*

I2. Software includes qualified references to other objects.

REUSABLE

FAIR Guiding Principles (2016)

The ultimate goal of FAIR is to optimize the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.

FAIR4RS Principles (2022)

Software is both **usable** (can be executed) and **reusable** (can be understood, modified, built upon, or incorporated into other software).

R
E
U
S
A
B
L
E

FAIR Guiding Principles (2016)

R1. (Meta)data are richly described with a plurality of accurate and relevant attributes

R1.1. (Meta)data are released with a clear and accessible data usage license

FAIR4RS Principles (2022)

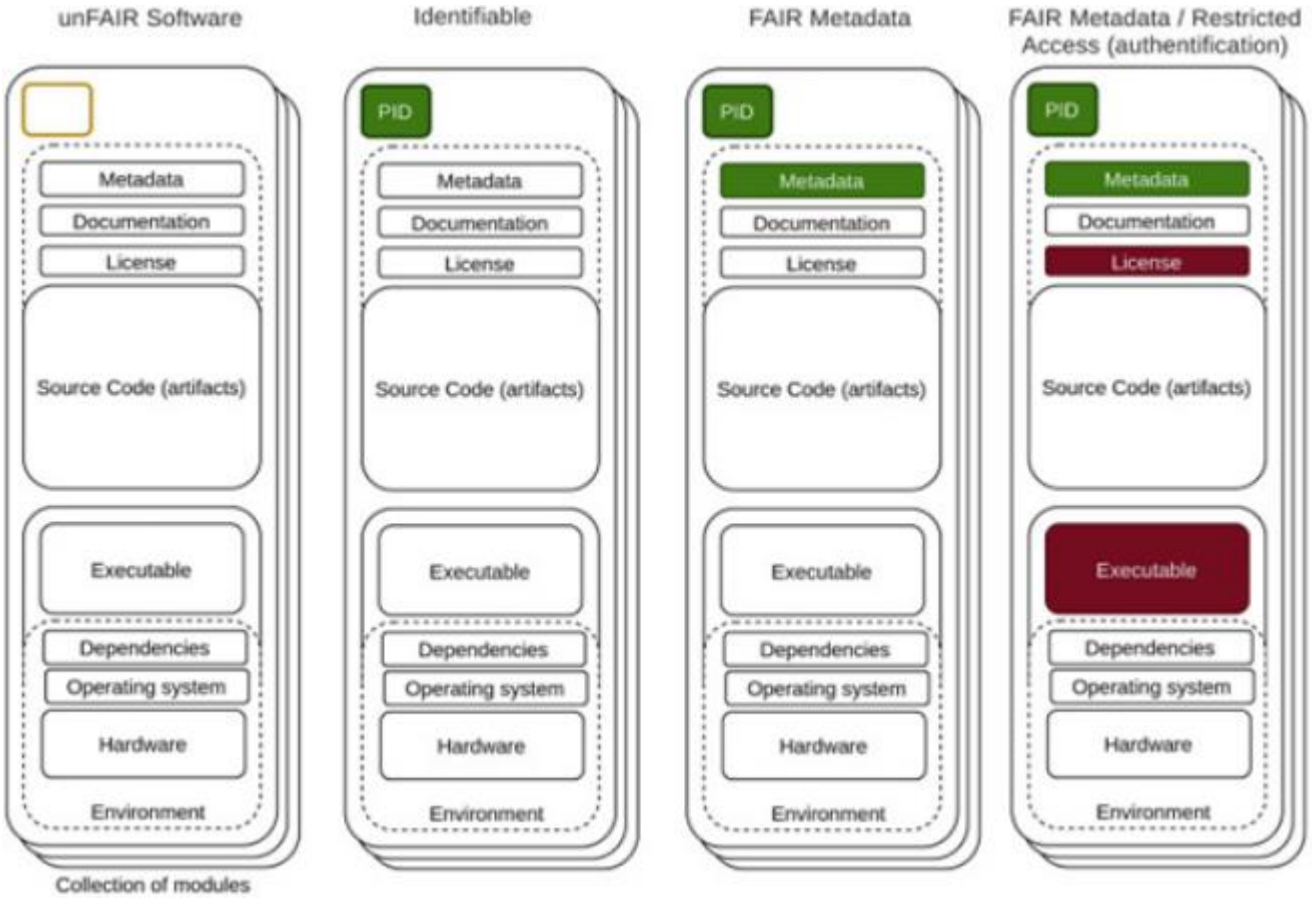
R1. Software is described with a plurality of accurate and relevant attributes.

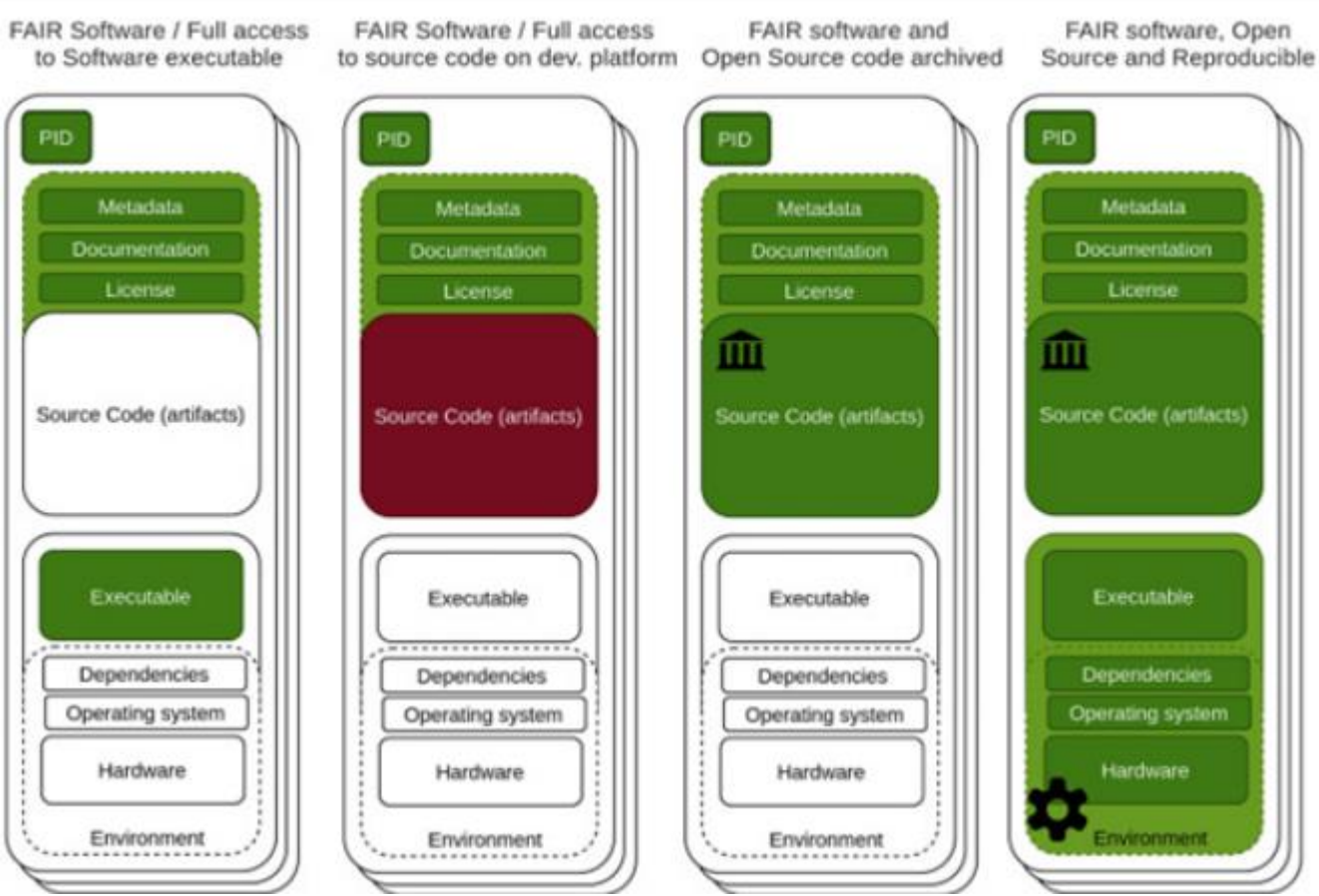
R1.1. Software is given a clear and accessible license.

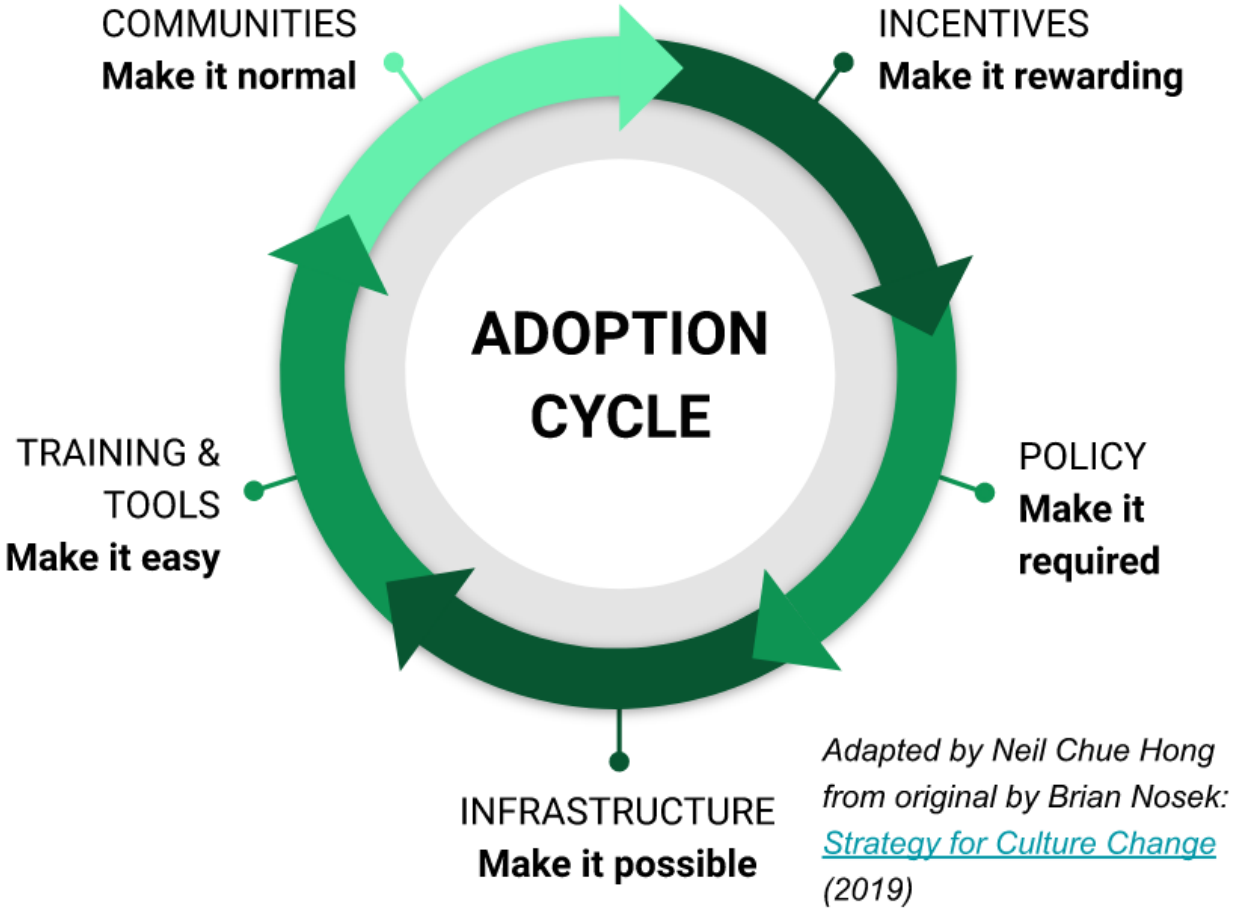
R E U S A B L E

FAIR Guiding Principles (2016)	FAIR4RS Principles (2022)
R1.2. (Meta)data are associated with detailed provenance	**R1.2**. Software is associated with detailed provenance.
	R2. Software includes **qualified references to other software**.
R1.3. (Meta)data meet domain-relevant community standards	**R3**. Software meets domain-relevant community standards.

Merci pour votre attention !


unFAIR Software
Identifiable
FAIR Metadata
FAIR Metadata / Restricted Access (authentification)
PID
Metadata
Documentation
License
Source Code (artifacts)
Executable
Dependencies
Operating system
Hardware
Environment
Collection of modules


FAIR Software / Full access to Software executable
FAIR Software / Full access to source code on dev. platform
FAIR software and Open Source code archived
FAIR software, Open Source and Reproducible
PID
Metadata
Documentation
License
Source Code (artifacts)
Executable
Dependencies
Operating system
Hardware
Environment



Adapted by Neil Chue Hong from original by Brian Nosek: Strategy for Culture Change (2019)