

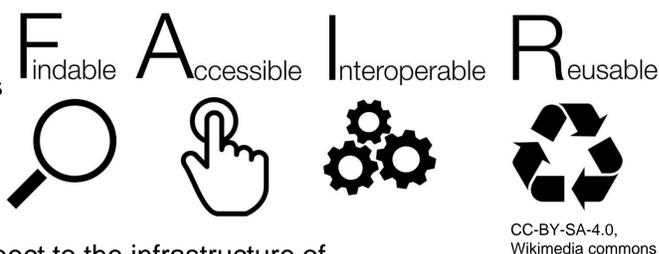
# Quantifying FAIRness: evaluating Helmholtz data repositories using F-UJI

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## Overview

The Helmholtz Metadata Collaboration (HMC) works towards making research data comply with the FAIR principles [1], i.e. data should be findable, accessible, interoperable and reusable. Automatic and quantitative evaluation of FAIRness, of data publications within a repository is important to understand the limitations of FAIR data with respect to the infrastructure of the corresponding repositories. Through our findings we have identified key repository based problems.



## Assessment tool

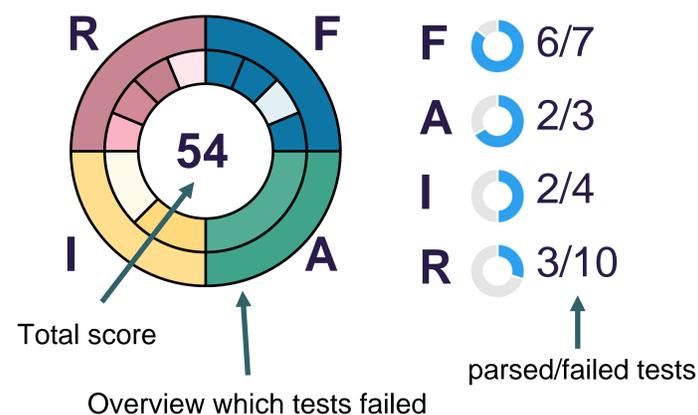
The F-UJI framework [2] developed by the FAIRsFAIR project is a powerful tool that provides a score for the FAIRness for machine findable and readable metadata of a given publication with respect to the FAIRsFAIR metric [3]. We co-develop F-UJI to explore and evaluate ways to apply it in user-sided tools.



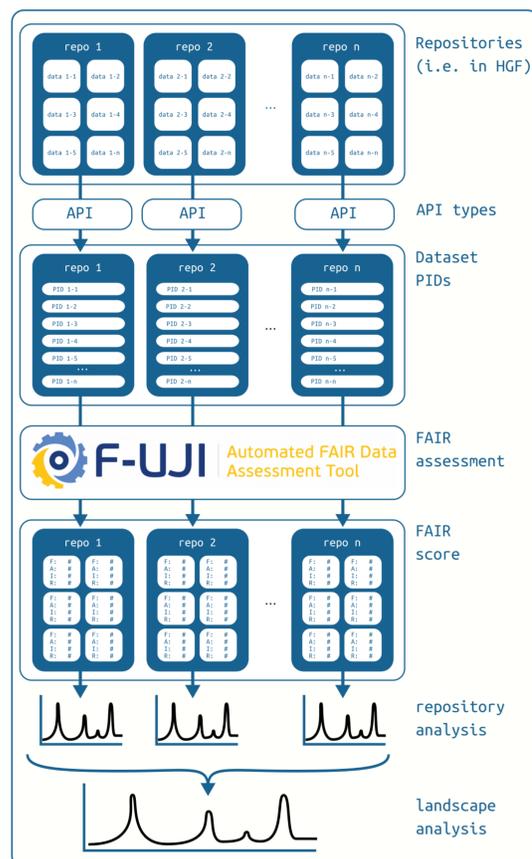
## Single record example:

Given a Persistent Identifier (PID), for example in the form of a DOI, F-UJI harvests metadata from the data set landing page and other data providers. Then it evaluates the quality of this metadata with a formal set of tests derived from the FAIRsFAIR maturity model, resulting in FAIR scores for each part of the FAIR principles and a Total score.

Result visualization:

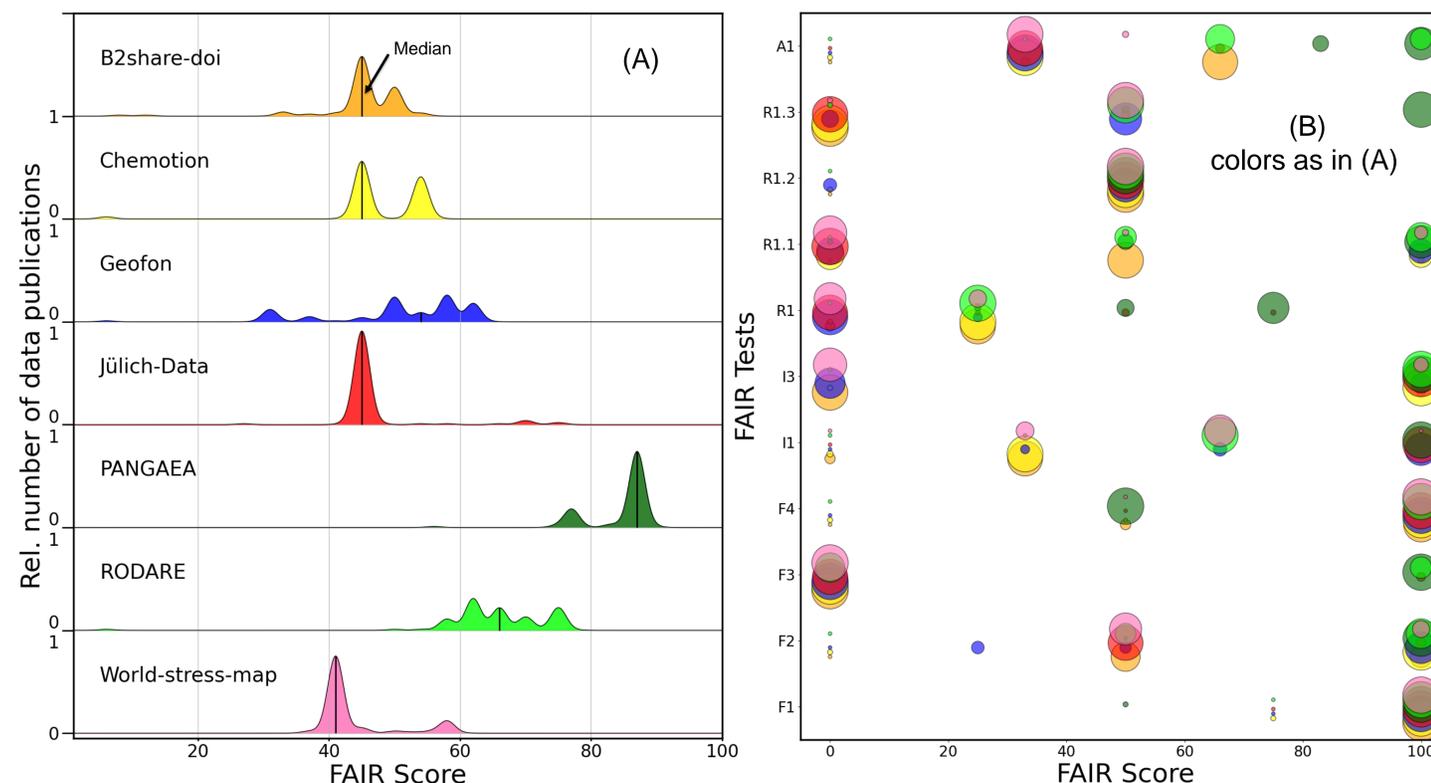


## Workflow overview:



## FAIRness of Helmholtz based data repositories:

There are over 100 data repositories related to the Helmholtz association listed in Re3data. Only a small subset of those have accessible APIs and DOIs for datasets, which is required for automatic FAIR assessment. Below we present the results for seven data repositories hosted by Helmholtz centers.



## Sum up and Outlook:

- code dev**: Develop code and software for automatic FAIR assessment and reports
- consulting**: HMC offers consulting on how repositories can improve the FAIRness of records through better meta data standards and exposure.



In the future we plan to analyze such developments over time to track the improvements over time and extract information about the respected cultural change within the HGF, or a certain research domain.

## References:

[1] Wilkinson, M.D. et al. *Sci Data* 3, 160018 (2016)  
 [2] Devaraju, A., Huber, R. (2020). F-UJI. Zenodo. <https://doi.org/10.5281/zenodo.4063720>  
 [3] Devaraju, A., et al. (2020). FAIRsFAIR Metrics. Zenodo. <https://doi.org/10.5281/zenodo.6461229>

## Acknowledgements:

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