Automated evaluation: FOOPS!

An Ontology Pitfall Scanner for the FAIR principles

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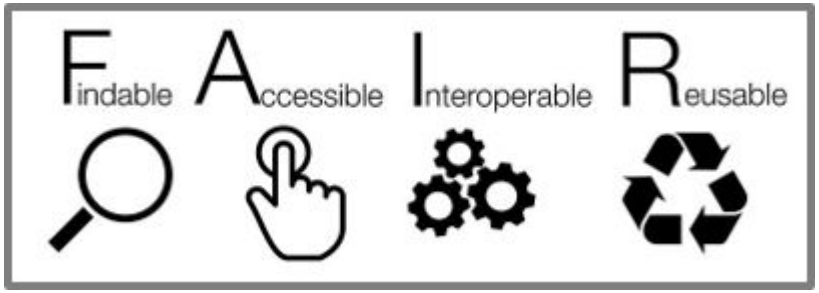
The rise of the FAIR Data principles



Data (initially) [1]

Research Software

Methods

Semantic artefacts

Other guidelines:

- Guidelines for Transparency and Openness Promotion (TOP) [2]
- Reproducibility Enhancement Principles (REP) [3]
- ...

RDA
RESEARCH DATA ALLIANCE

FORCE11
The Future of Research Communications and e-Scholarship

[1] Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* **3,** 160018 (2016). https://doi.org/10.1038/sdata.2016.18
[2] https://www.cos.io/initiatives/top-guidelines
[3] Stodden, V et al Enhancing reproducibility for computational methods https://www.science.org/lookup/doi/10.1126/science.aah6168

FAIR is not new: Background in the Semantic Web

- Linked Data principles [1] and 5-star ranking

1. Use URIs
2. HTTP URIs
3. Resolve and provide useful info
4. Link to other URIs

☆ Available
☆☆ Machine readable
☆☆☆ Open format
☆☆☆☆ Use standards
☆☆☆☆☆ Link to other resources

- LD Principles adapted to ontologies [2] [3]
- Best practices for accessing vocabularies [4]
- Tutorials for publishing vocabularies [5]
-

How does all come together?

[1] https://www.w3.org/DesignIssues/LinkedData.html
[2] https://bvatant.blogspot.com/2012/02/is-your-linked-data-vocabulary-5-star_9588.html
[3] Janowicz, K., Hitzler, P., Adams, B., Kolas, D., Vardeman, I., et al.: Five stars of linked data vocabulary use. Semantic Web 5(3), 173–176 (2014)
[4] Best Practice Recipes for Publishing RDF Vocabularies. https://www.w3.org/TR/swbp-vocab-pub/
[5] Garijo, Daniel (2013): How to (properly) publish a vocabulary or ontology in the web. figshare. Journal contribution. https://doi.org/10.6084/m9.figshare.881824.v1

FOOPS!: A Pitfall Scanner for the FAIR principles

- Validation service inspired by OOPS! (OntOlogy Pitfall Scanner)

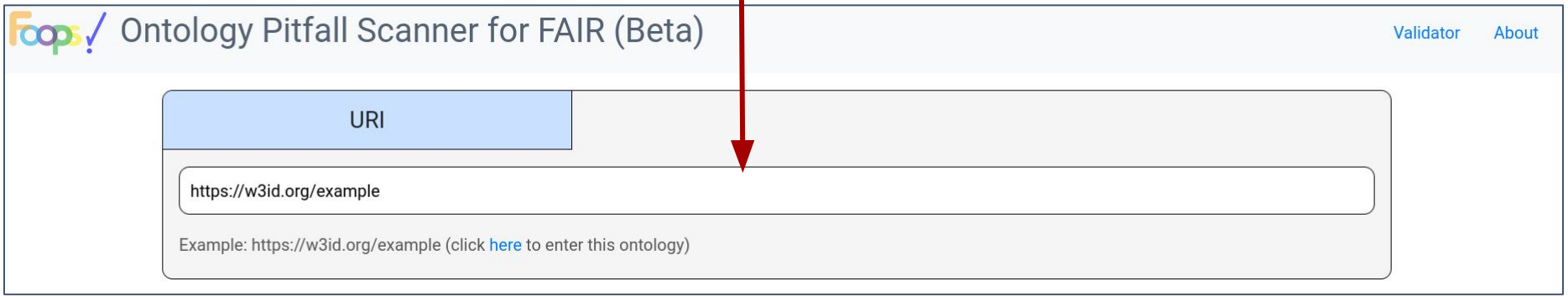
- Designed to guide users
  - Tests have an explanation
  - Tests indicate potential errors

- Practical
  - Based on years of ontology engineering practices from research projects at UPM

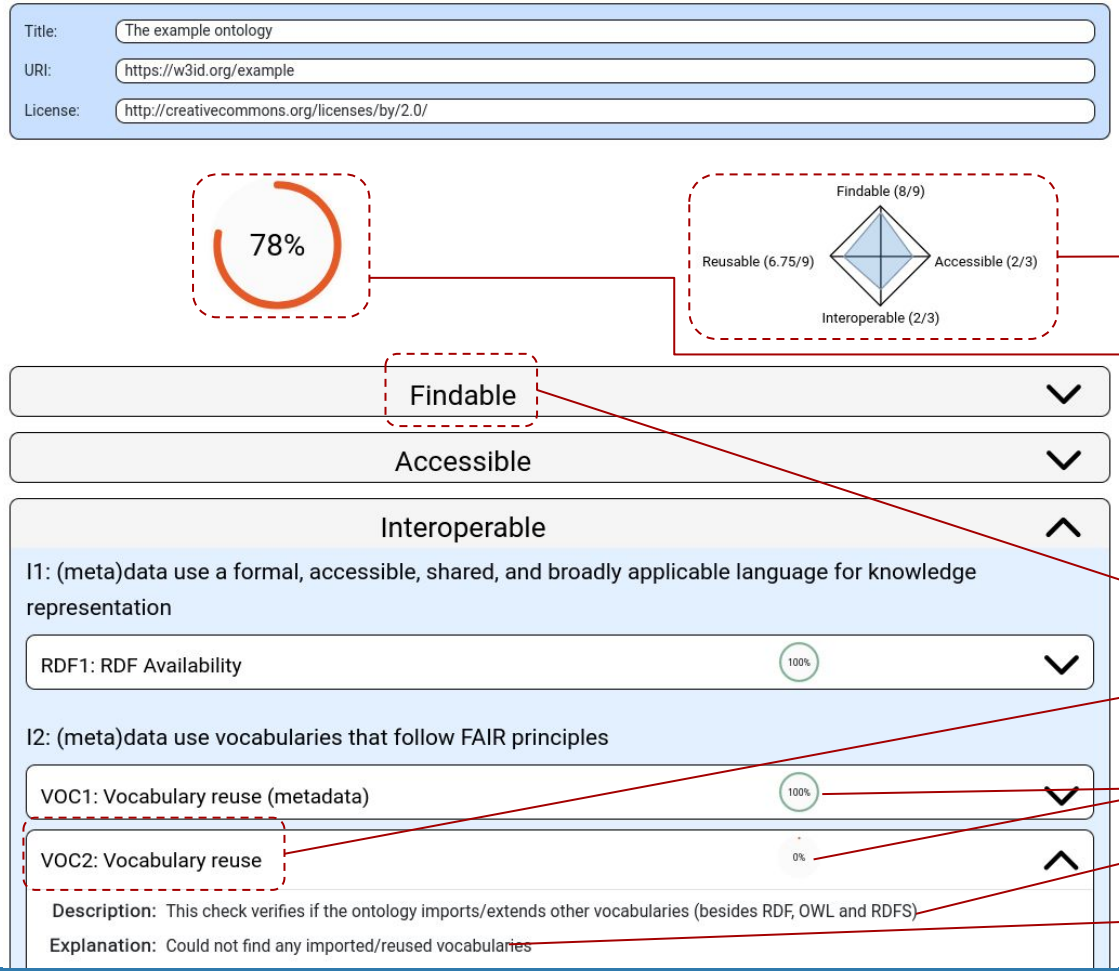
- Aligned to FAIR

Live demo: https://w3id.org/foops/

Enter an ontology URI



FOOPS!: Getting the full report



Ontology metadata summary

FAIRness coverage by category

FAIRness overall score. **Note:** this may be a quality indicator, but there is no defined threshold for FAIRness.

FAIR Category

Check

Check coverage

Check description

Check explanation

Summary of supported tests

Findable

- Ontology URI is resolvable
- Ontology URI is persistent
- Version IRI exists (and resolves)
- Ontology id is ontology URI
- Minimum metadata is available (e.g., title, description, version info, etc.)
- Ontology prefix is in registry
- Ontology is in registry

Accessible

- Ontology is available in RDF/HTML (content negotiation)
- Ontology is in a registry (repeated)
- Ontology is URI is defined in HTTP/HTTPS

Interoperable

- Ontology is at least available in RDF
- Ontology reuses known vocabularies for declaring metadata (DC, Schema, PROV, etc.)
- Ontology extends other vocabularies

Reusable

- HTML representation of the ontology exists
- Extensive metadata is provided with the ontology
- Labels and descriptions exist for all terms
- License is provided and resolvable
- Metadata includes provenance information

Help us improve FOOPS!

Errors? (please be gentle)
New tests?
Suggestions?

https://github.com/oeg-upm/fair_ontologies

Drop us a message:
foops@delicias.dia.fi.upm.es

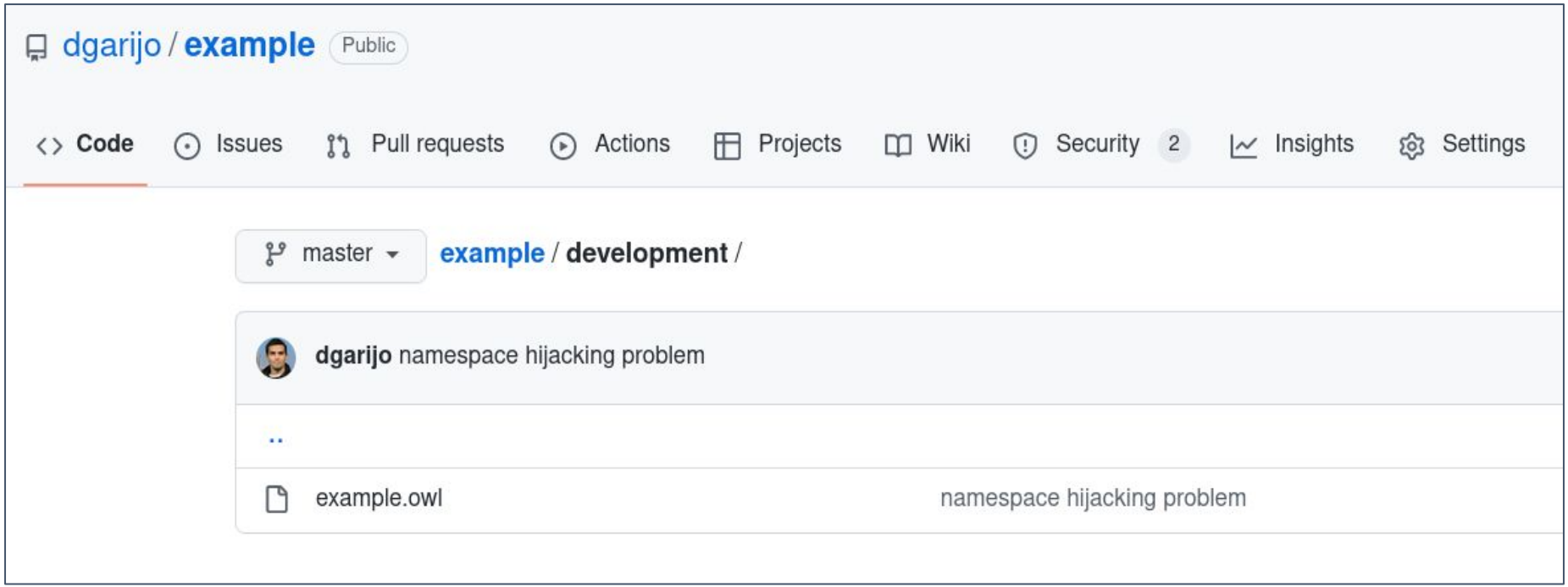
Twitter: **@OOPSoeg**

https://w3id.org/foops/

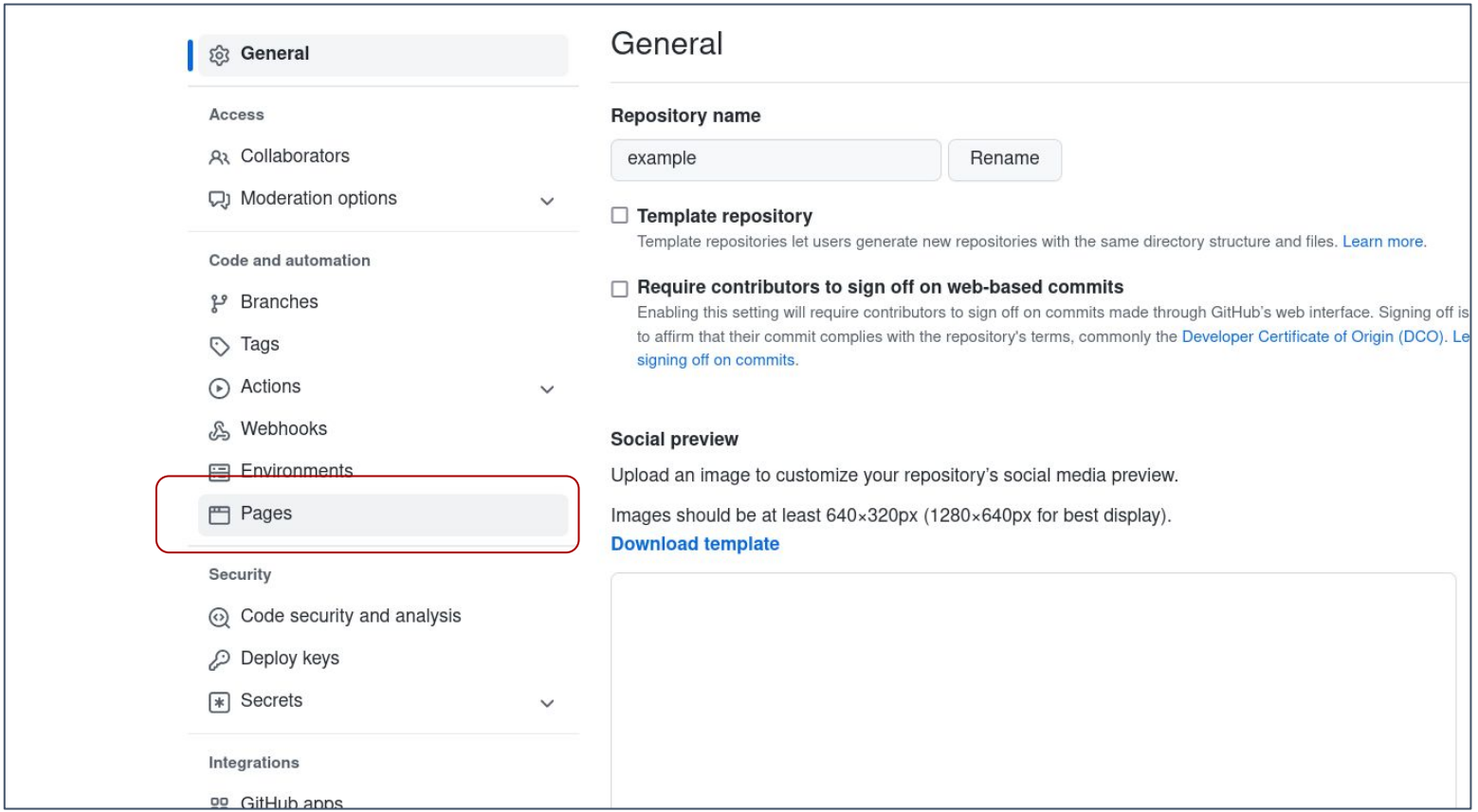
Publications:
https://foops.linkeddata.es/about.html

What if you don’t have a URL yet for your ontology?

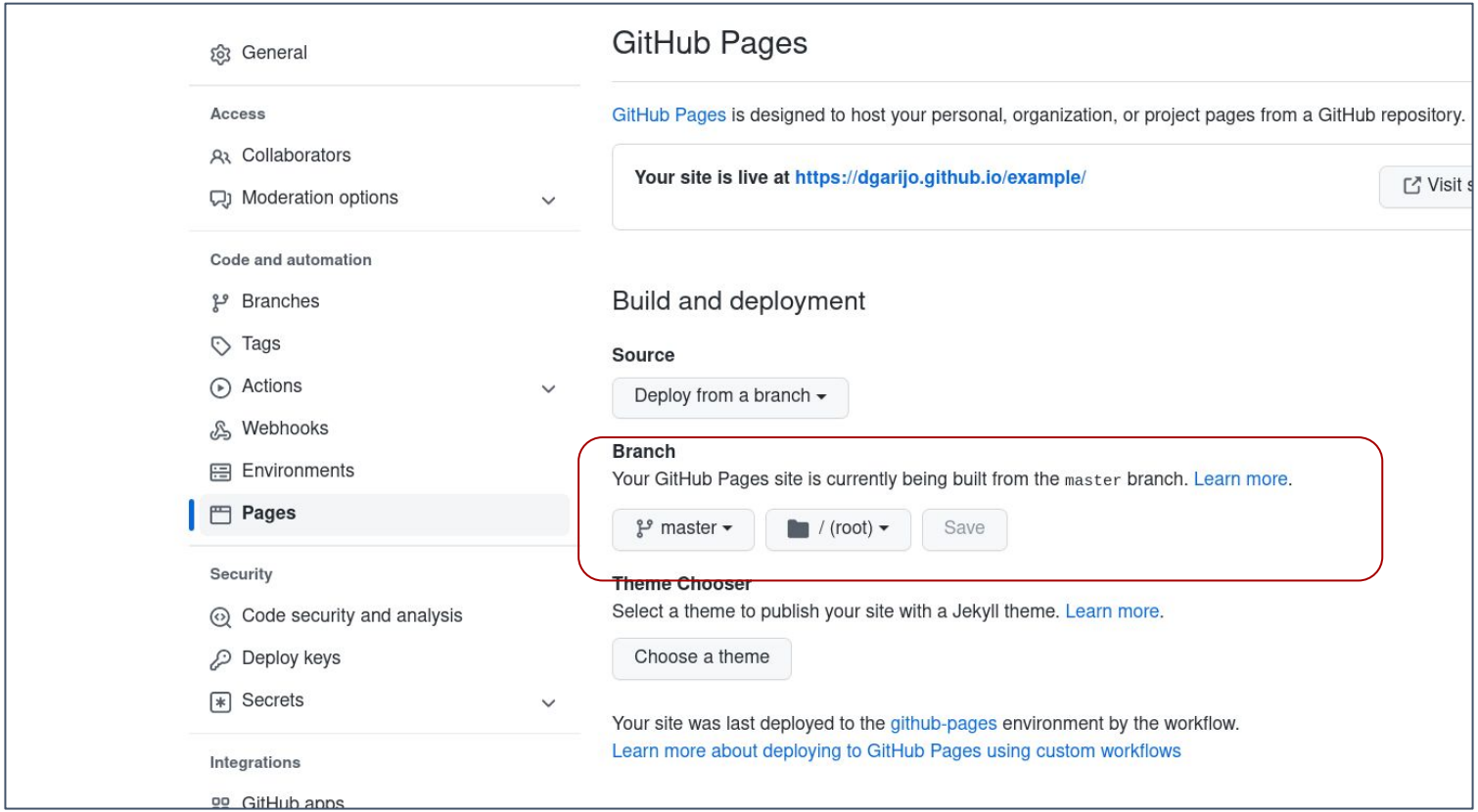
- Don’t worry! Follow the these steps:
  - 1) Put your ontology in a GitHub repository



2) Activate GitHub pages



2) Activate GitHub pages



3) Copy final link in FOOPS!