



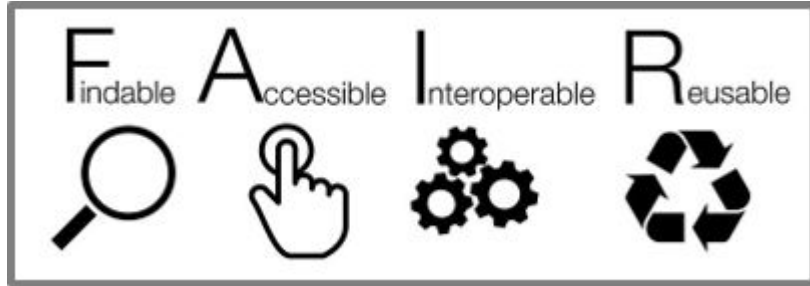
# Automated evaluation: FOOPS!

An Ontology Pitfall Scanner for the FAIR principles

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Data (initially) [1]



Research Software



Methods



Semantic artefacts

Other guidelines:

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



[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>

- Linked Data principles [1] and 5-star ranking
  1. Use URIs ☆ Available
  2. HTTP URIs ☆☆ Machine readable
  3. Resolve and provide useful info ☆☆☆ Open format
  4. Link to other URIs ☆☆☆☆ 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](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>



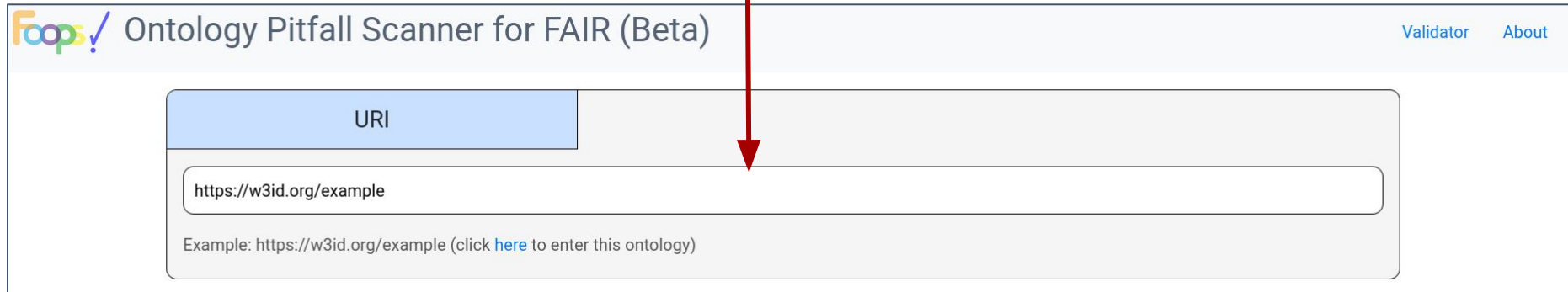
- **Validation service** inspired by OOPS! (Ontology Pitfall Scanner)



- 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



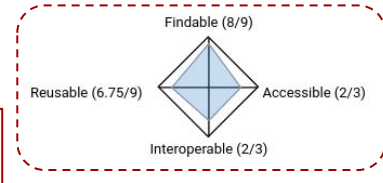
The screenshot shows the FOOPS! web interface. At the top left is the logo "foops!" followed by the title "Ontology Pitfall Scanner for FAIR (Beta)". On the top right are links for "Validator" and "About". Below the title is a form with a light blue header labeled "URI". Underneath is a text input field containing the example URI "https://w3id.org/example". Below the input field is a line of text: "Example: https://w3id.org/example (click [here](#) to enter this ontology)". A red arrow points from the text "Enter an ontology URI" above to the input field.

Title:

URI:

License:

} 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.

Findable

Accessible

FAIR Category

Interoperable

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

RDF1: RDF Availability

I2: (meta)data use vocabularies that follow FAIR principles

VOC1: Vocabulary reuse (metadata)

VOC2: Vocabulary reuse

Description: This check verifies if the ontology imports/extends other vocabularies (besides RDF, OWL and RDFS)

Explanation: Could not find any imported/reused vocabularies

Check

Check coverage

Check description

Check explanation



## 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](https://github.com/oeg-upm/fair_ontologies)

Drop us a message:

**foops@delicias.dia.fi.upm.es**

Twitter: **@OOPSoeg**

<https://w3id.org/foops/>



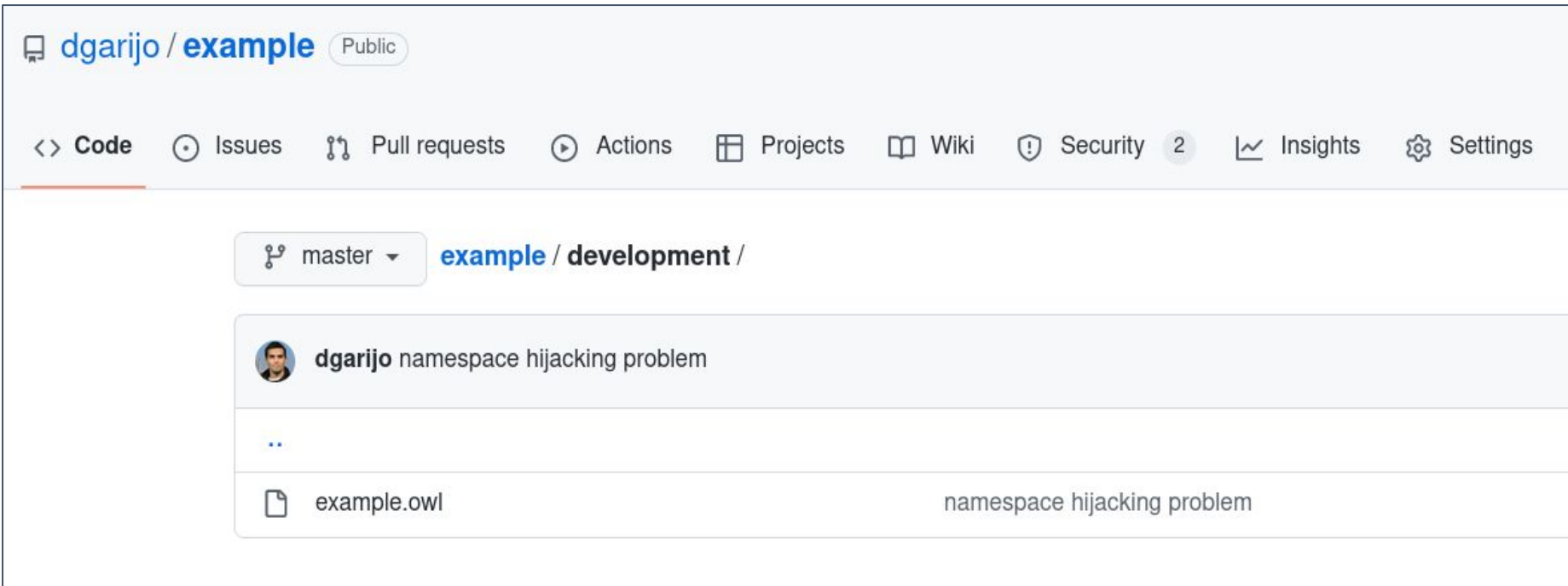
Publications:

<https://foops.linkeddata.es/about.html>



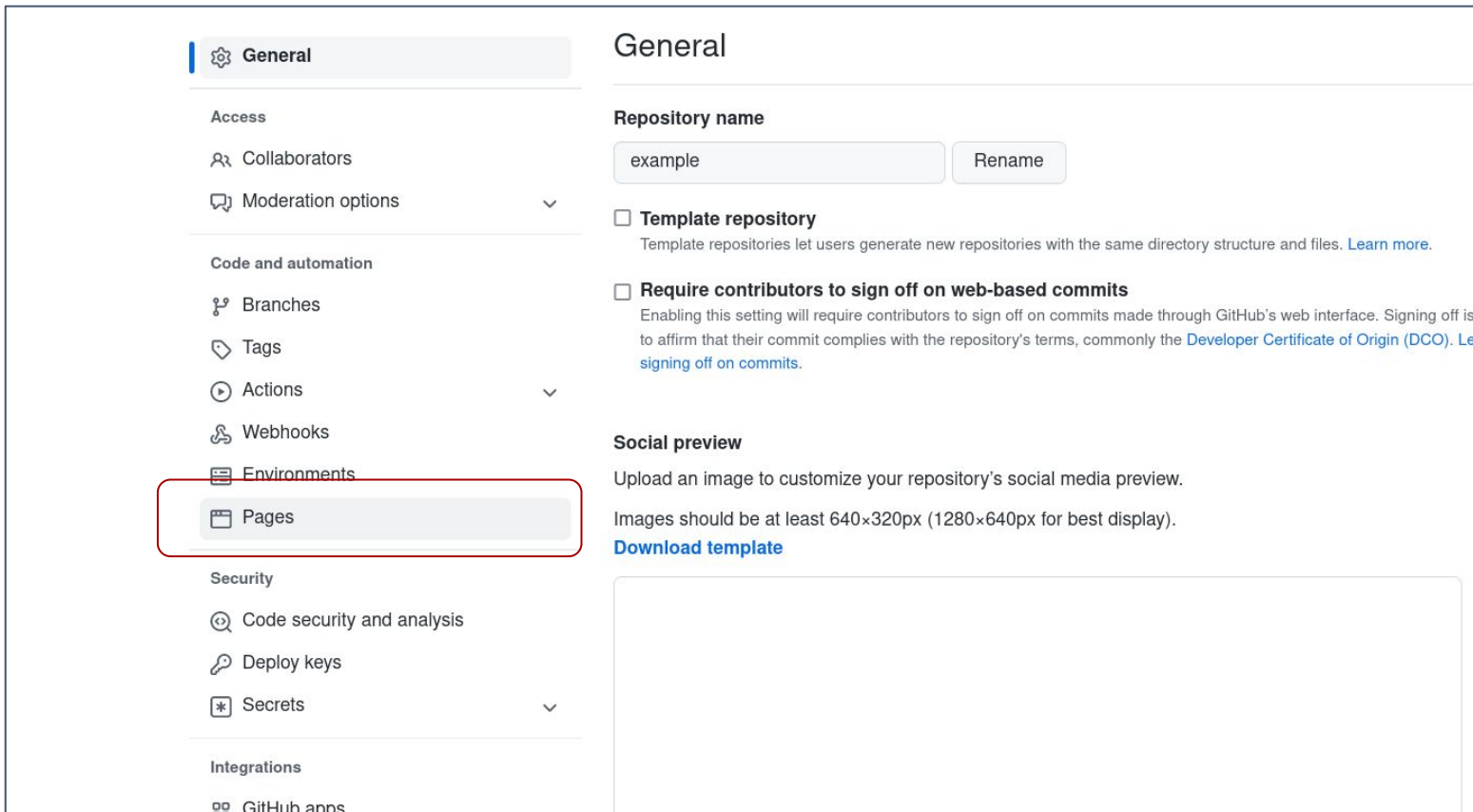
## What if you don't have a URL yet for your ontology?

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



The screenshot shows a GitHub repository page for 'dgarijo / example' (Public). The navigation bar includes 'Code', 'Issues', 'Pull requests', 'Actions', 'Projects', 'Wiki', 'Security' (with a notification badge '2'), 'Insights', and 'Settings'. Below the navigation bar, the repository path is shown as 'master' (selected) / 'example' / 'development'. The main content area displays a commit by 'dgarijo' titled 'namespace hijacking problem'. Below the commit, there is a file named 'example.owl' with the description 'namespace hijacking problem'.

## 2) Activate GitHub pages



**General**

**Access**

- Collaborators
- Moderation options

**Code and automation**

- Branches
- Tags
- Actions
- Webhooks
- Environments
- Pages**

**Security**

- Code security and analysis
- Deploy keys
- Secrets

**Integrations**

- GitHub apps

### General

**Repository name**

example Rename

**Template repository**  
Template repositories let users generate new repositories with the same directory structure and files. [Learn more.](#)

**Require contributors to sign off on web-based commits**  
Enabling this setting will require contributors to sign off on commits made through GitHub's web interface. Signing off is to affirm that their commit complies with the repository's terms, commonly the [Developer Certificate of Origin \(DCO\)](#). [Learn more about signing off on commits.](#)

**Social preview**

Upload an image to customize your repository's social media preview.

Images should be at least 640x320px (1280x640px for best display).

[Download template](#)

## 2) Activate GitHub pages

**General**

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**Integrations**

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### GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is live at <https://dgarijo.github.io/example/> [Visit site](#)

### Build and deployment

**Source**

Deploy from a branch

**Branch**

Your GitHub Pages site is currently being built from the master branch. [Learn more.](#)

master / (root) Save

**Theme Chooser**

Select a theme to publish your site with a Jekyll theme. [Learn more.](#)

Choose a theme

Your site was last deployed to the [github-pages](#) environment by the workflow. [Learn more about deploying to GitHub Pages using custom workflows](#)

### 3) Copy final link in FOOPS!

URI

<https://dgarijo.github.io/example/release/1.0.1/ontology.ttl>

Example: <https://w3id.org/example> (click [here](#) to enter this ontology)

RUN

Title:

URI:

License:

74%

Findable ( )

Reusable (6.75/9)

