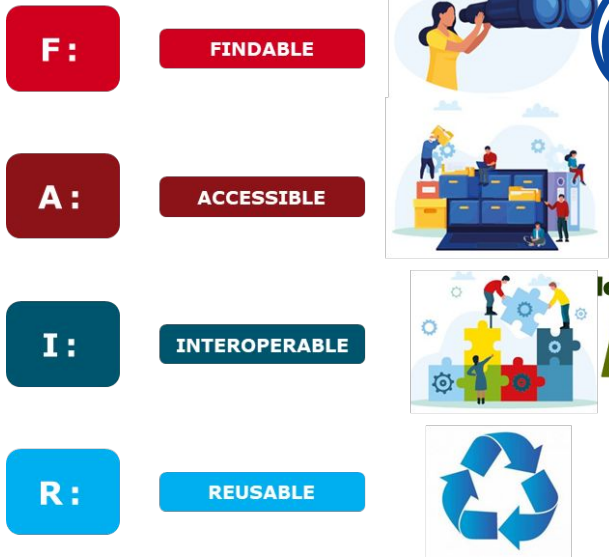
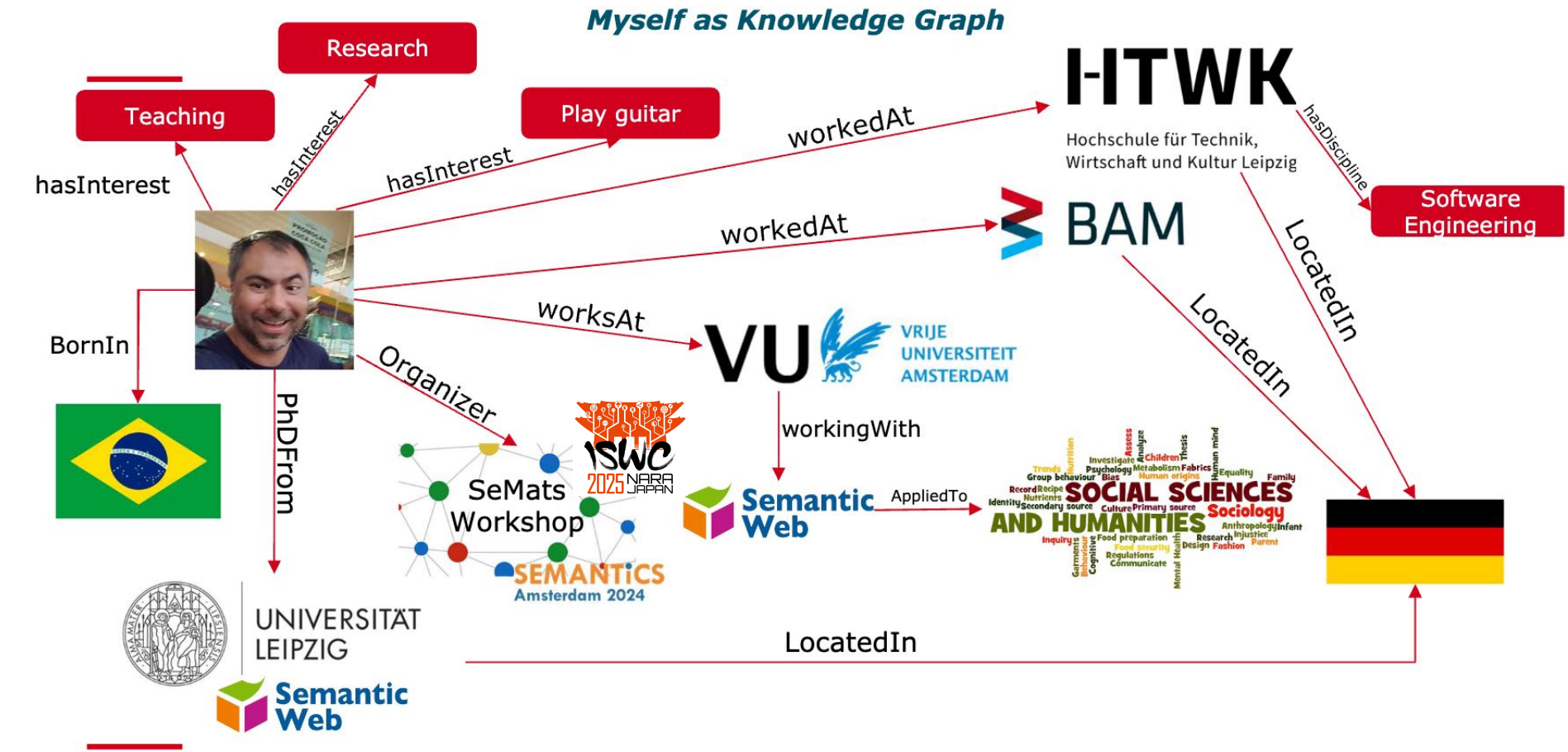
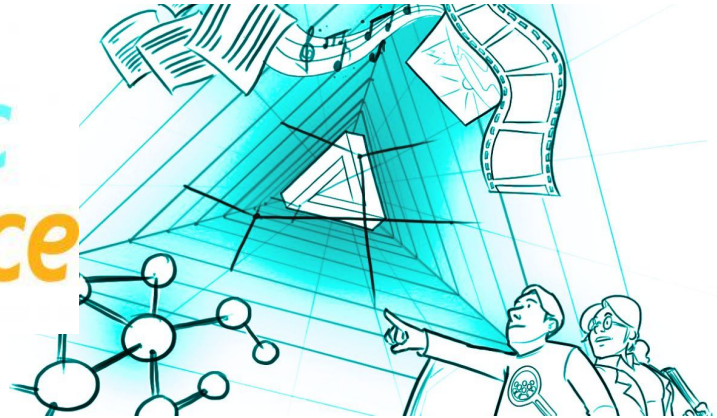
Knowledge Graphs and FAIR principles applied to Social Sciences and Humanities on SSHOC-NL project

By Andre Valdestilhas




Myself as Knowledge Graph
Research
Teaching
Play guitar
hasInterest
hasInterest
hasInterest
workedAt
workedAt
worksAt
Organizer
BornIn
PhDFrom
I-ITWK
Hochschule für Technik, Wirtschaft und Kultur Leipzig
hasDiscipline
Software Engineering
BAM
LocatedIn
LocatedIn
VU
VRIJE UNIVERSITEIT AMSTERDAM
workingWith
ISWC 2025 NARA JAPAN
SeMats Workshop
SEMANTiCS Amsterdam 2024
Semantic Web
AppliedTo
SOCIAL SCIENCES AND HUMANITIES
UNIVERSITÄT LEIPZIG
Semantic Web
LocatedIn

User-Centric Data Science



Research topics

- Cultural heritage, Linguistics, FAIR principles, Digital Humanities …, and **Semantic Web applied in diverse areas, i.e., Social Sciences and Humanities**

Website (https://ucds.cs.vu.nl/)

- Blog, People, Projects, Demos, tools and Data, Publications

Bachelor students

- **Link prediction** on Social Sciences and Humanities
  - Conventional algorithms work compare to neural networks
- **FAIR tools** applied to Social Sciences and humanities, **a comparison and benchmark**
  - key challenges and limitations in adapting FAIR principles to SSH research.
- **Ontology alignment** for Social Sciences and humanities data
  - key barriers to schema alignment across SSH datasets
- **Benchmark and comparison on the state of the art Ontology and vocabulary repositories** for Social Sciences and humanities
  - scope and coverage, interoperability, usability, community support, and integration with SSH research tools.

> Projects, and more…

Hybrid Intelligence

Augmenting Human Intellect

HAICu

Cultural digital heritage

SSHOC NL

social sciences & humanities open cloud

SW + FAIR + SSH

PRESSING MATTER

data models for societal reconciliation with the colonial past and past and its afterlives

HEDGE-IoT

Holistic DiGitalization of the Energy Ecosystem adopting IoT solutions

Civic AI Lab

CAIL

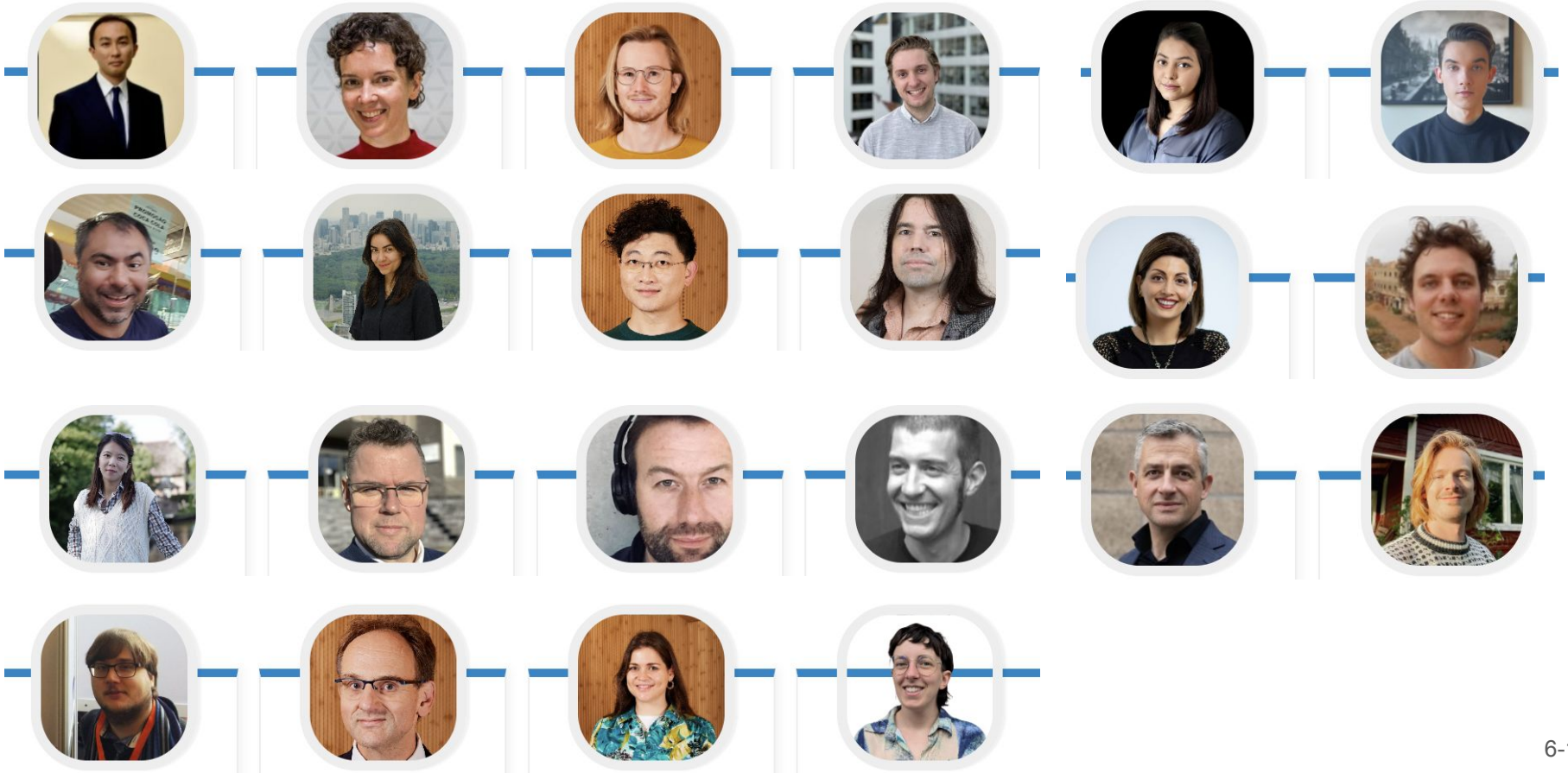
AI highlighting the inequality of opportunity in society

Cultural AI

a lab for culturally valued AI

Socio-technological AI systems for human culture

UCDS group (people)



Facilitate FAIR principles to Social Sciences and Humanities (SSH)

- Annotation and search
  - Tabular data to RDF
  - Query with NLP/LLM
- Linksets
- APIs
- LOD model
  - Use of standard vocabularies/ontologies
- Vocabulary registry e.g., CLARIAH
  - Identify missing vocabularies
- Deliverable include:
  - Knowledge Graph, requirement analysis, Visual interface, quality assurance

SSHOC
social sciences & humanities open cloud

SSHOC-NL Knowledge Graph

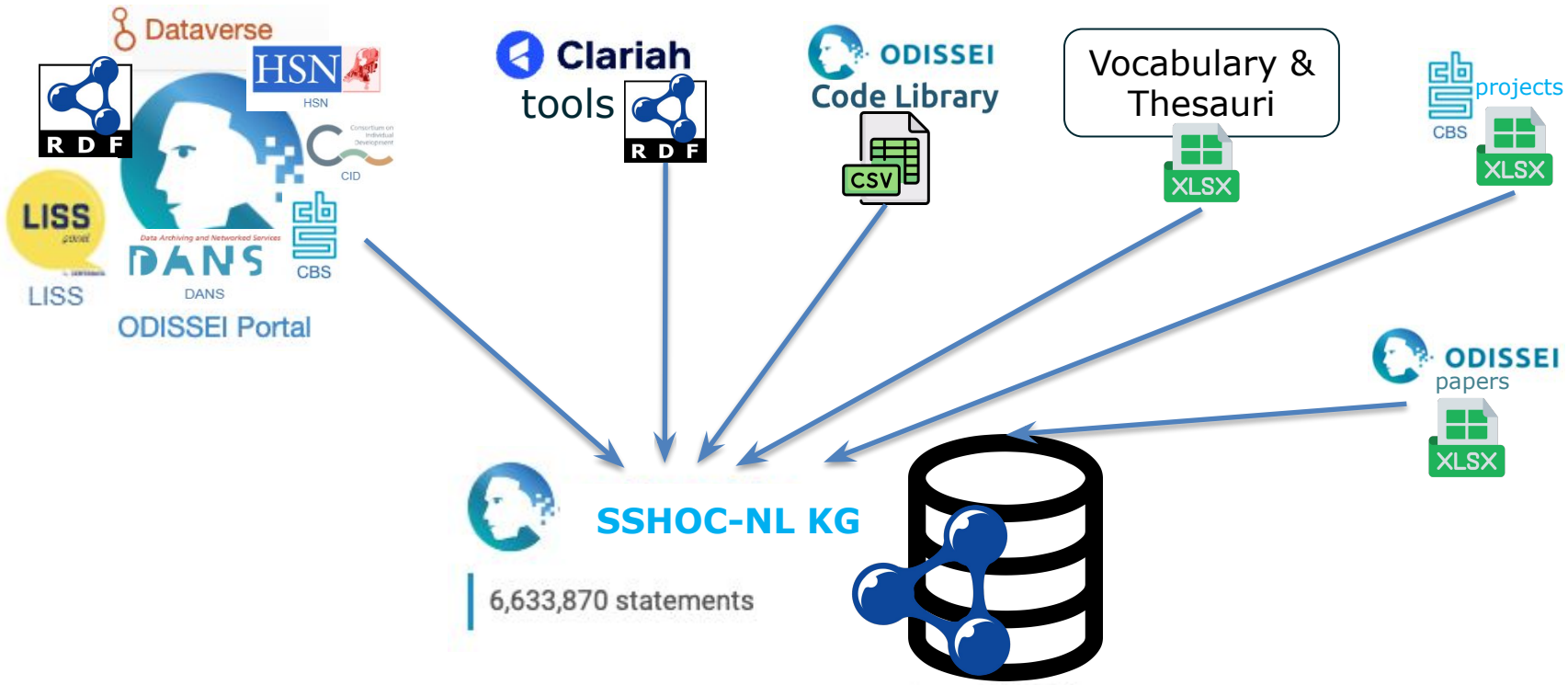
Objective: Develop an initial proof-of-concept knowledge graph (KG).

Key Aspects:

- Models the academic ecosystem in social science & humanities.
- Captures relationships between **researchers**, **datasets**, **research software**, and **research papers**.
- Reuses publicly available data.
- Uses persistent identifiers (DOIs for papers and datasets, ORCIDs for authors, etc.).

More Information: Read our data story about this knowledge graph.
`https://kg.odissei.nl/odissei/-/stories/ODISSEI-Knowledge-Graph-the-story`

Where does the data come from?



FAIR tools vs FIPs

- Same dataset -> Different results
- Automation vs Questionnaire

FAIR Checker

F-UJI Automated FAIR Data Assessment Tool

VS

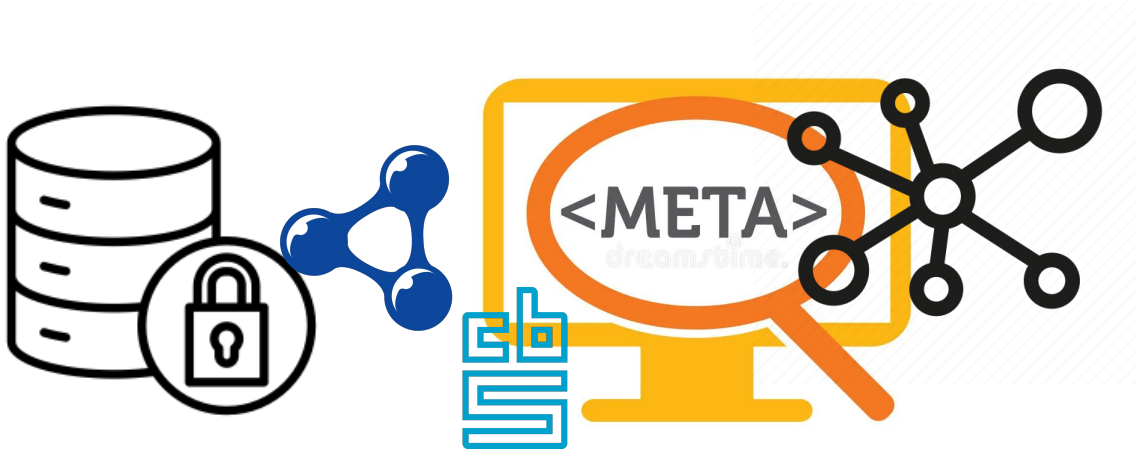
FIP

CLARIN

ODISSEI

Making closed data FAIR

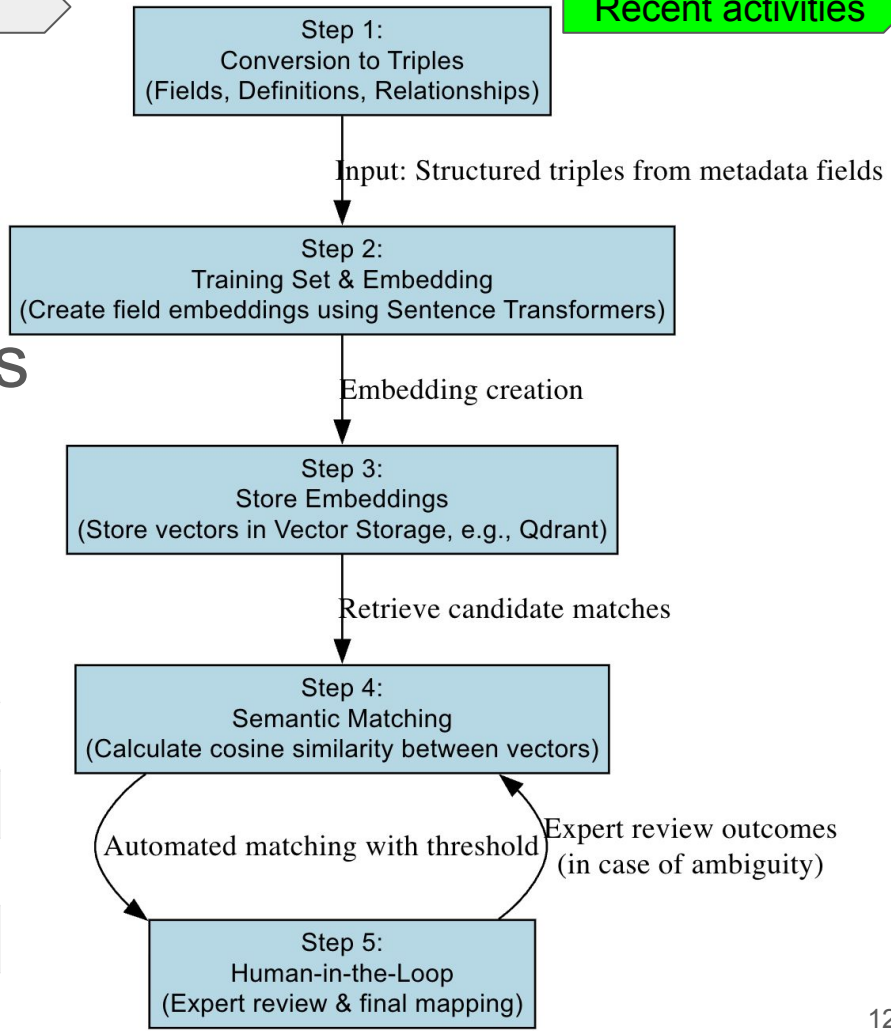
- Dataset-Variable Ontology
  - Private data(tabular) - Public metadata(Information about columns)
- Data don’t need to be Open, but can be FAIR
- Example: CBS metadata available but not the datasets



Ontology Alignment with LLMs and knowledge graphs

CodeMeta Crosswalk WIKIDATA

Property	Wikidata
codeRepository	P1324
programmingLanguage	P277
runtimePlatform	P400
downloadUrl	P4945



SeMatS2025

International Workshop on Semantic Materials Science

Harnessing the Power of Semantic Web Technologies in Materials Science

Deadline: August 2th

Co Located at: ISWC 2025 NARA JAPAN

THE 24th INTERNATIONAL SEMANTIC WEB CONFERENCE
November 2-6, 2025 - Nara, Japan

https://sites.google.com/view/semats2025

VU VRIJE UNIVERSITEIT AMSTERDAM

LINKÖPING UNIVERSITY

FIZ Karlsruhe

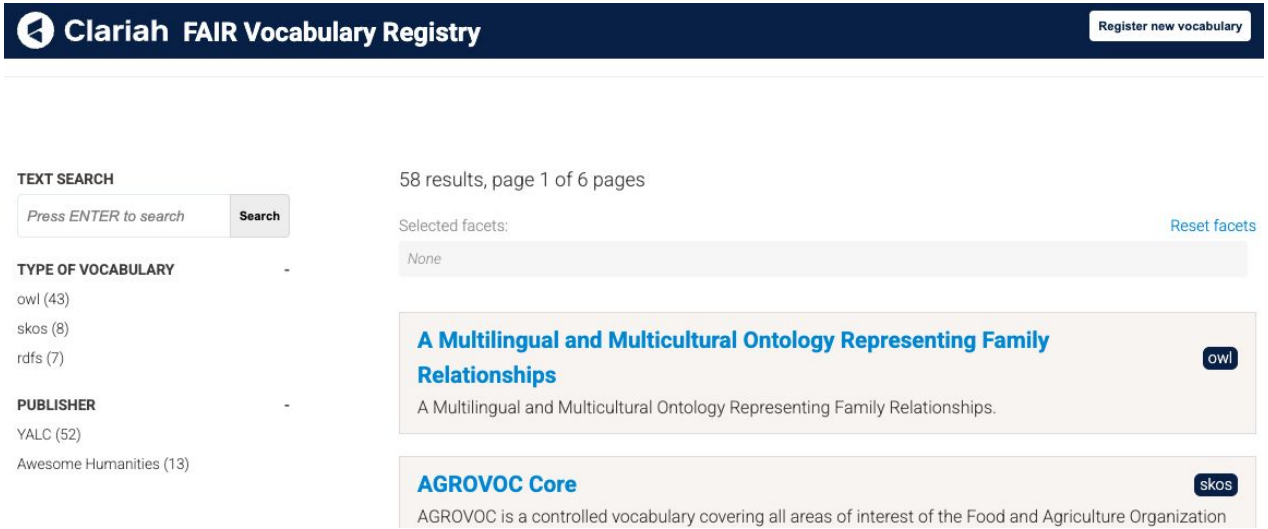
Organizers: Andre Valdestilhas, Huanyu Li, Patrick Lambrix, and Harald Sack

Digital Humanities Benelux Amsterdam 2025 June 3th

Hands on workshop

Let's talk FAIR

creating, finding and (re)using vocabularies in the Humanities and Social Sciences research



Recent papers

ESWC 2025 (2 papers) 1 best paper award

- FAIR tools vs FIPs
- Enhancing Provenance Research with Linked Data: A Visual Approach to Knowledge Discovery

Thanks

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