



**Towards a
National Research Data Infrastructure
for Data Science and Artificial Intelligence**

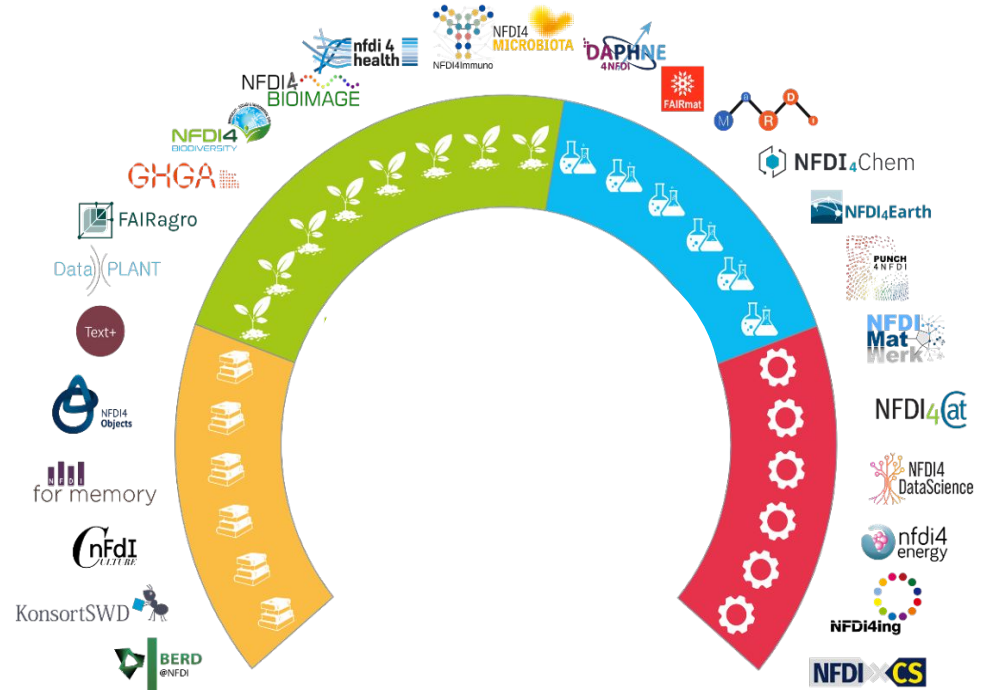
Prof. Dr. Sonja Schimmler

12.2024

NFDI: National Research Data Infrastructure



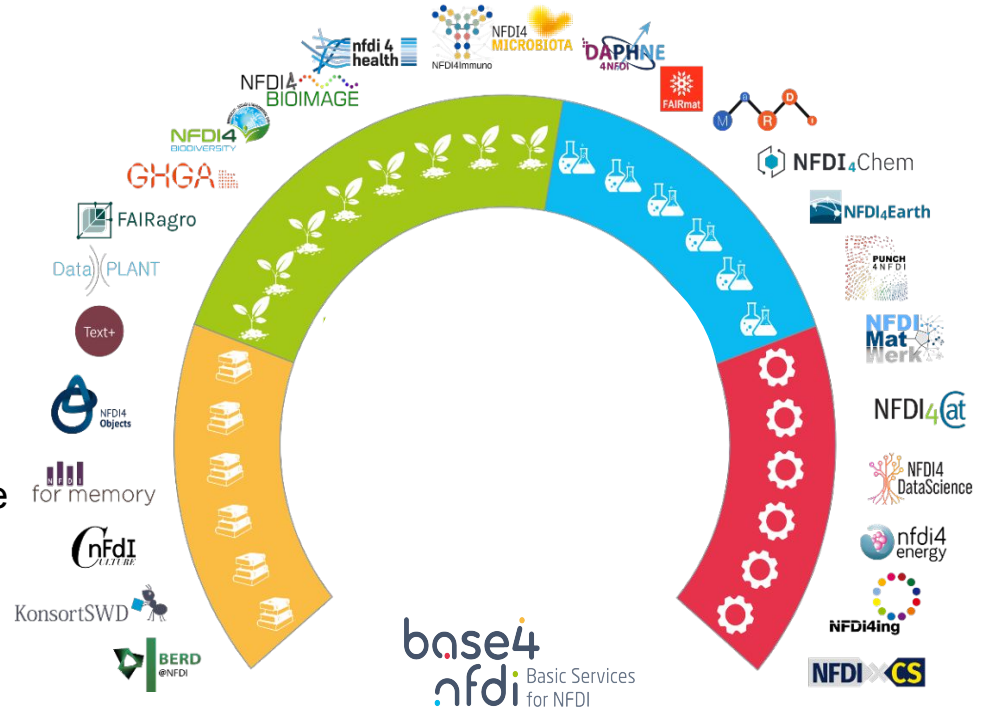
- NFDI to set up a ...
 - ... National Research Data Infrastructure
- 26 domain-specific NFDI consortia



NFDI: National Research Data Infrastructure



- NFDI to set up a ...
 - ... National Research Data Infrastructure
- 26 domain-specific NFDI consortia
 - ... and Base4NFDI
- Sections on Cross-cutting Topics
 - Common Infrastructures
 - Ethical, Legal and Social Aspects
 - Industry Engagement
 - Metadata, Terminologies, Provenance
 - Training and Education



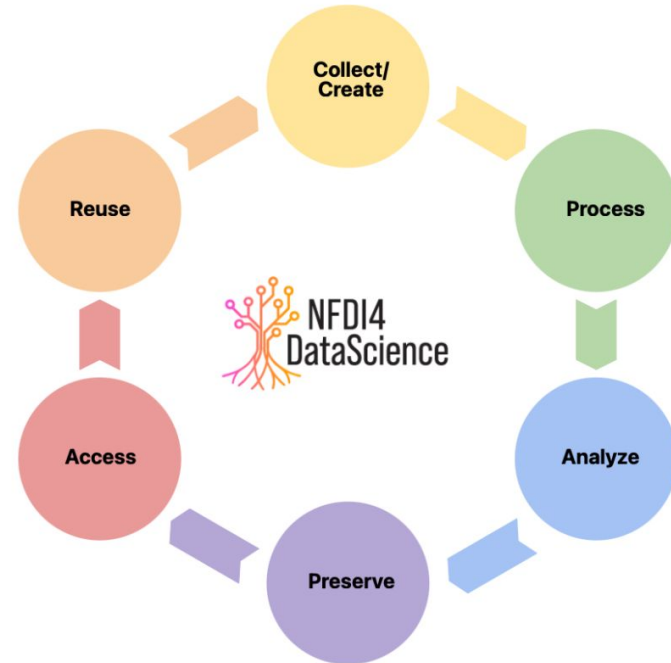
NFDI4DS: NFDI for Data Science and Artificial Intelligence



- NFDI4DS to set up a ...
 - ... **National Research Data Infrastructure for Data Science and Artificial Intelligence**

NFDI4DS: NFDI for Data Science and Artificial Intelligence

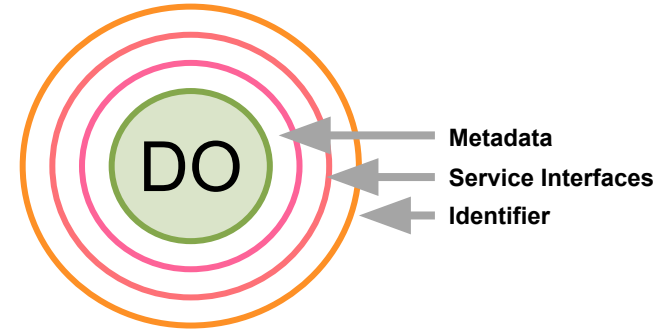
- NFDI4DS to set up a ...
 - ... **National Research Data Infrastructure for Data Science and Artificial Intelligence**
- **Our Vision**
 - Target the **data science** and **artificial intelligence community** in Germany
 - Support the **whole research data lifecycle**: collect/create, process, analyze, preserve, access, reuse



NFDI4DS: NFDI for Data Science and Artificial Intelligence

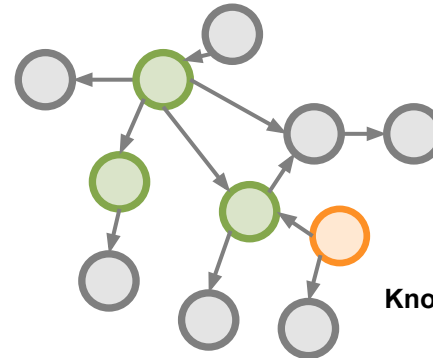
- NFDI4DS to set up a ...
 - ... **National Research Data Infrastructure for Data Science and Artificial Intelligence**

FAIR Digital Objects (FDOs)



- **Our Objectives**

- Develop, establish and sustain a national **research data infrastructure** and offer innovative tools and services
- Make **all digital artefacts** (articles, data, models, workflows, scripts/code) available
- **Interlink** all digital artefacts

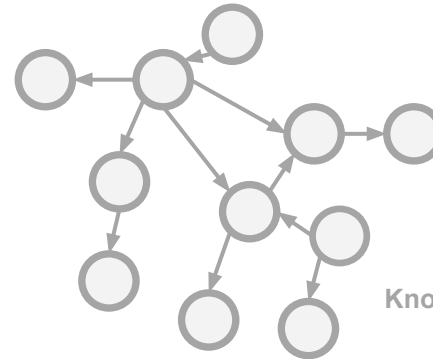
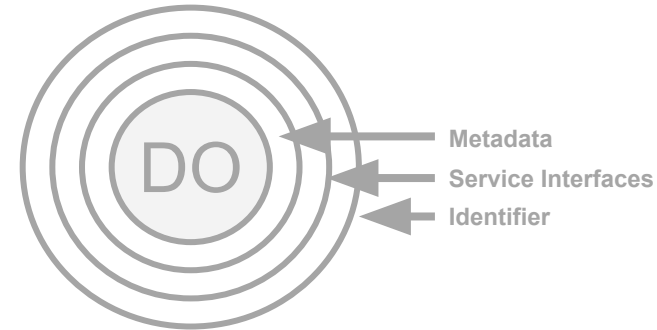


Knowledge Graphs (KGs)

NFDI4DS: NFDI for Data Science and Artificial Intelligence

- NFDI4DS to set up a ...
 - ... **National Research Data Infrastructure for Data Science and Artificial Intelligence**
- **Our Objectives**
 - Develop, establish and sustain a national **research data infrastructure** and offer innovative tools and services
 - Make **all digital artefacts** (articles, data, models, workflows, scripts/code) available
 - **Interlink** all digital artefacts
 - Foster **FAIR** (findable, accessible, interoperable, reusable) and **open** research
 - Increase **transparency, reproducibility** and **fairness**
 - Consider **ethical, legal** and **social** aspects

FAIR Digital Objects (FDOs)



Knowledge Graphs (KGs)

NFDI4DS: Infrastructure and Services



**FAIR Digital Objects
& Knowledge Graphs**

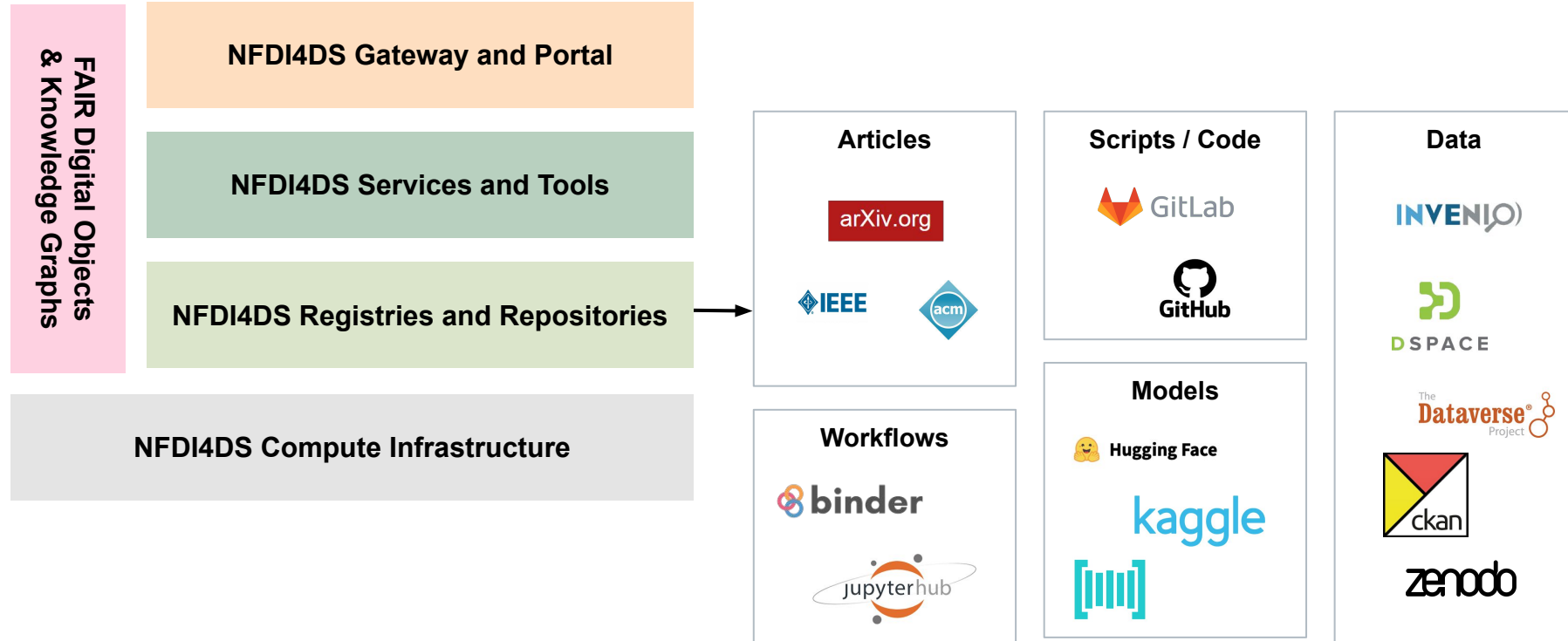
NFDI4DS Gateway and Portal

NFDI4DS Services and Tools

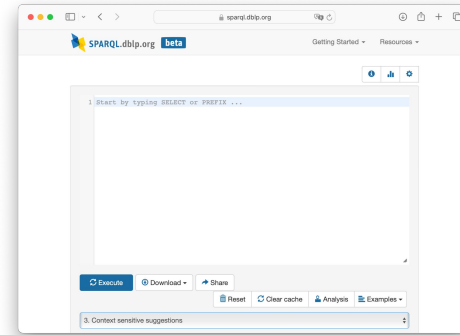
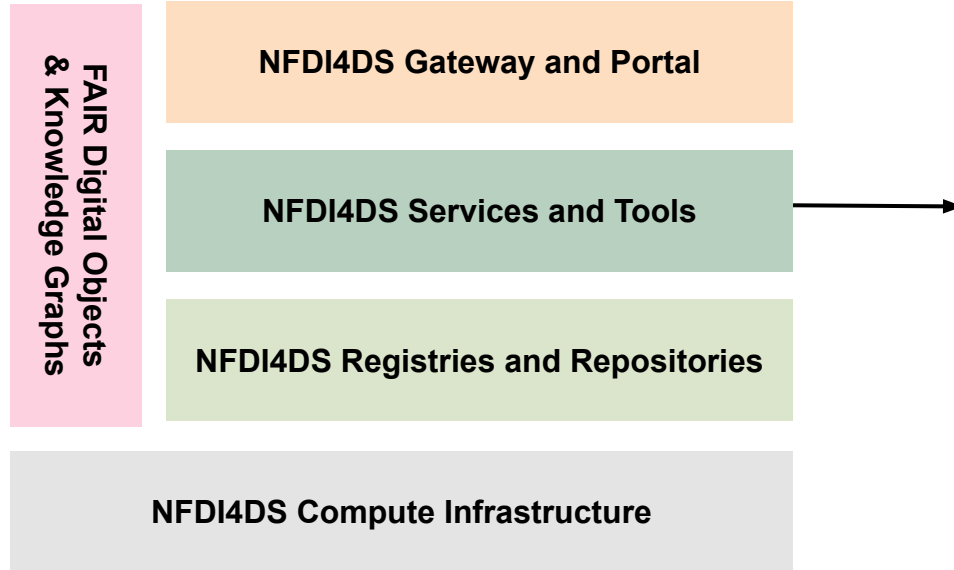
NFDI4DS Registries and Repositories

NFDI4DS Compute Infrastructure

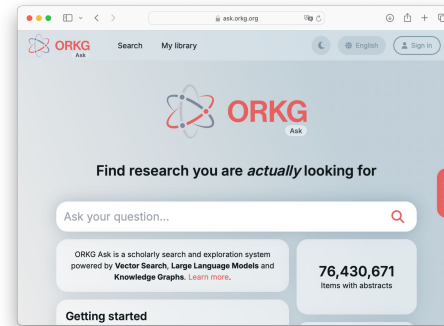
NFDI4DS: Infrastructure and Services



NFDI4DS: Infrastructure and Services

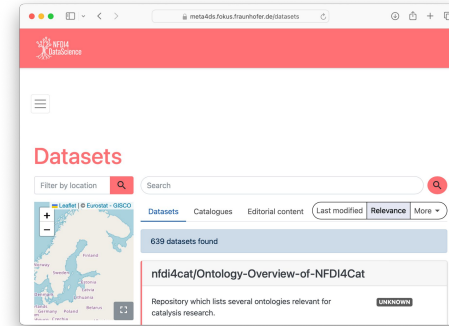
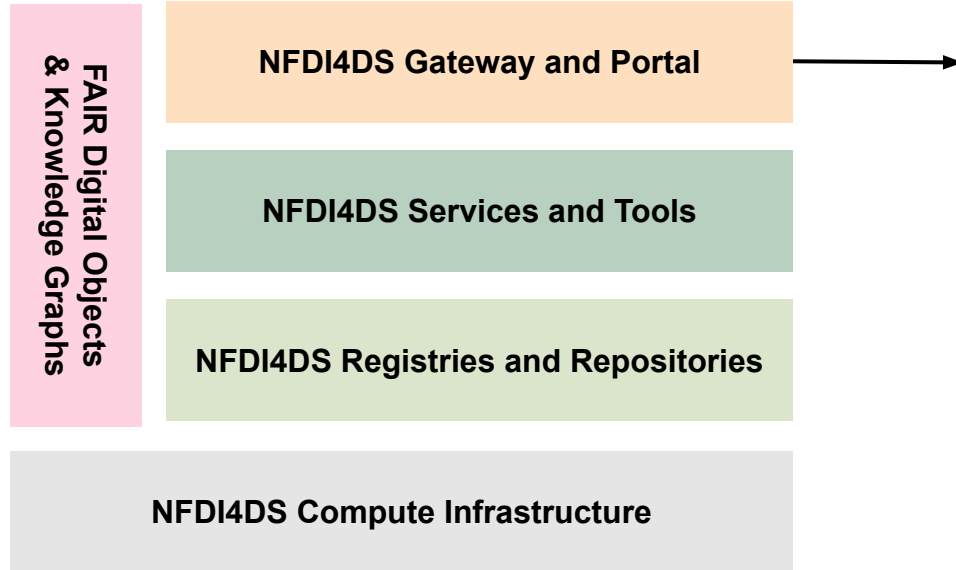


dblp SPARQL

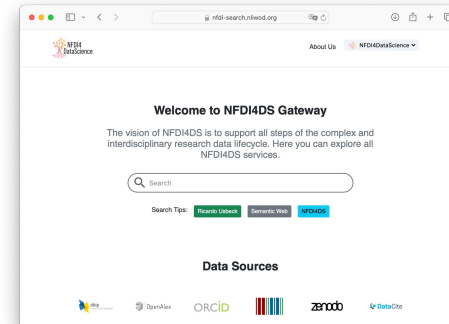


ORKG Ask

NFDI4DS: Infrastructure and Services



NFDI4DS Portal



NFDI4DS Gateway

- **Shared Tasks in 2023/2024**

- Scholarly QALD @ISWC 2024
 - Question answering over scholarly knowledge graphs
- LLMs4OL @ISWC 2024
 - Large language models for ontology learning
- SOTA @CLEF 2024
 - State-of-the-art tracking in AI scholarly publications
- FoRC, SOMD @ESWC 2024
 - Field of research classification for scholarly publications
 - Software mention detection in scholarly publications

TASK	Dataset	Metric	Score
Template-Based Automatic Search of Architectures One discovered architecture achieves	Compact Semantic Segmentation	mean IoU	63.2%
...	CamVid	Mean IoU	63.2
... .. evaluation. val	CityScapes	Mean IoU	67.8
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...	CityScapes	Mean IoU	67.8

- **Mini Hackathons in 2023/2024**

- Metadata for machine learning
- Machine-actionable software management plans
- Webby FDOs with RO-Crates and FAIR Signposting

NFDI4DS: Community Involvement - New Technologies



NFDI4DS Workshop 2024



NFDI4DS Consortium Meeting 2024



NFDI4DS Summer School 2024



NFDI4DS Video Series 2024



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