

Maintaining reproducible data workflows while keeping data in sync, backed up, and easily accessible from within and outside the lab is a key challenge in research. To minimize time and effort invested in these tasks scientists have to spend on these tasks, we provide a suite of tools designed for comprehensive, reproducible and versioned management of scientific data.

Organize and Store Data and Metadata

odML: Manage all information about an experiment

The odML format

- Open metadata format
- Flexible hierarchical key-value storage
- Template system for reusable metadata structures

meta.g-node.org

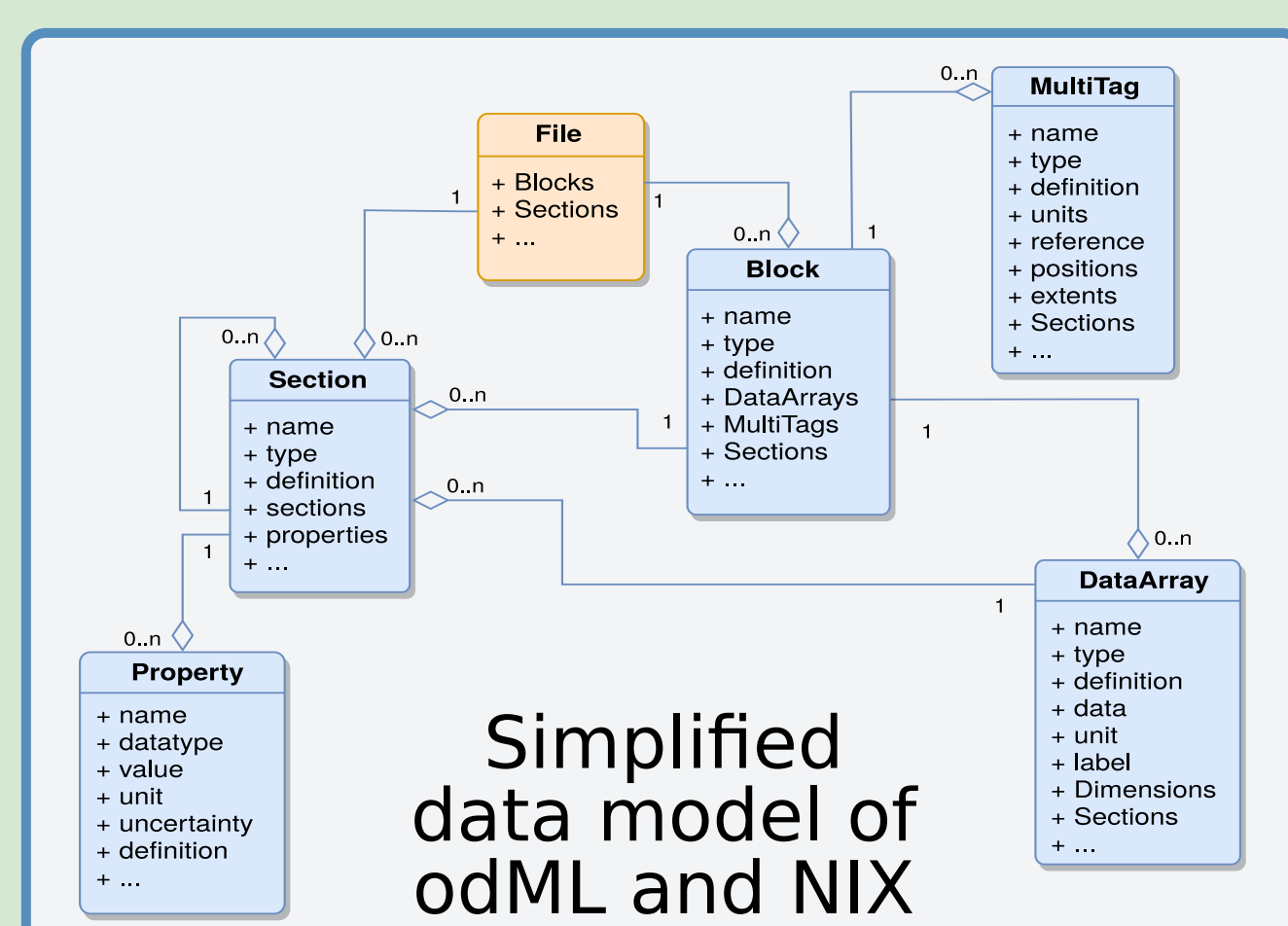
- export odML to RDF
- access diverse metadata datasets
- all datasets are publicly available
- searchable by SPARQL via API and web



Re-usable metadata concepts:

<https://templates.g-node.org>
Re-usable building blocks to construct metadata files.


<https://terminologies.g-node.org>
Importable definitions to link to metadata entities.



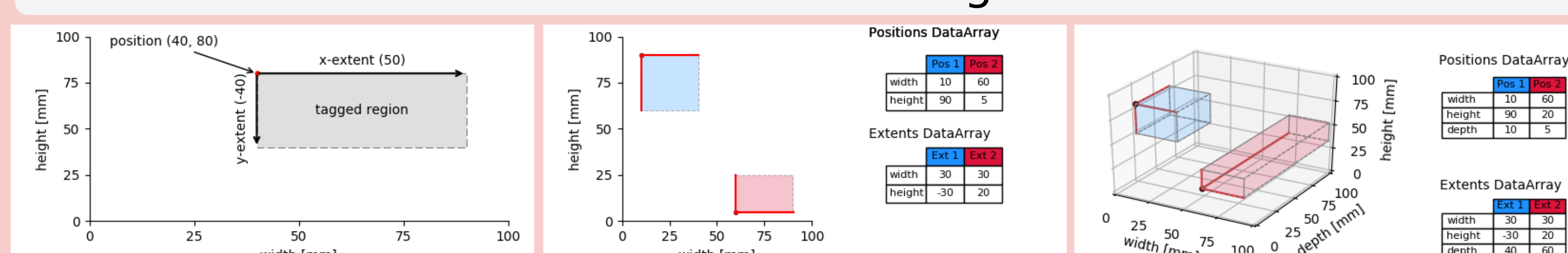
NIX: Manage data and metadata in one versatile format

The NIX format

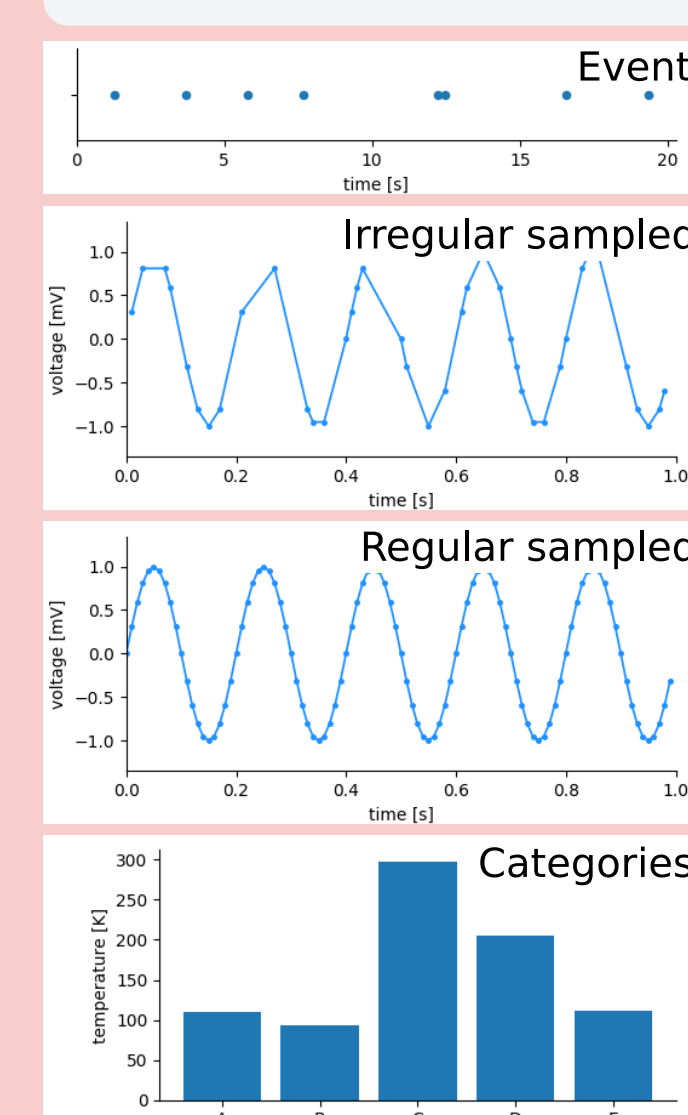
- Open data format
- Raw data, analysis results, and metadata in the same file
- Descriptive associations between data, analysis results, and metadata

Integrates with:
neo 

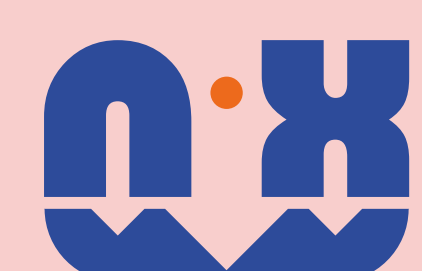
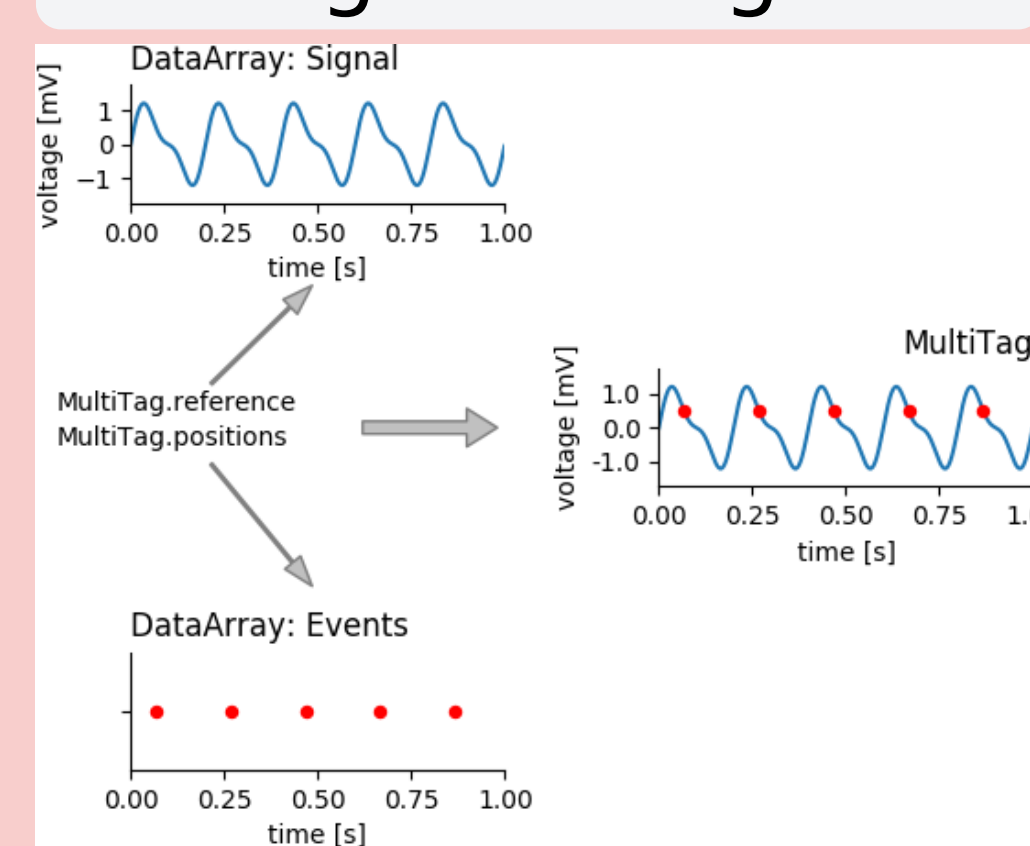
ROIs via MultiTags



Dimensions



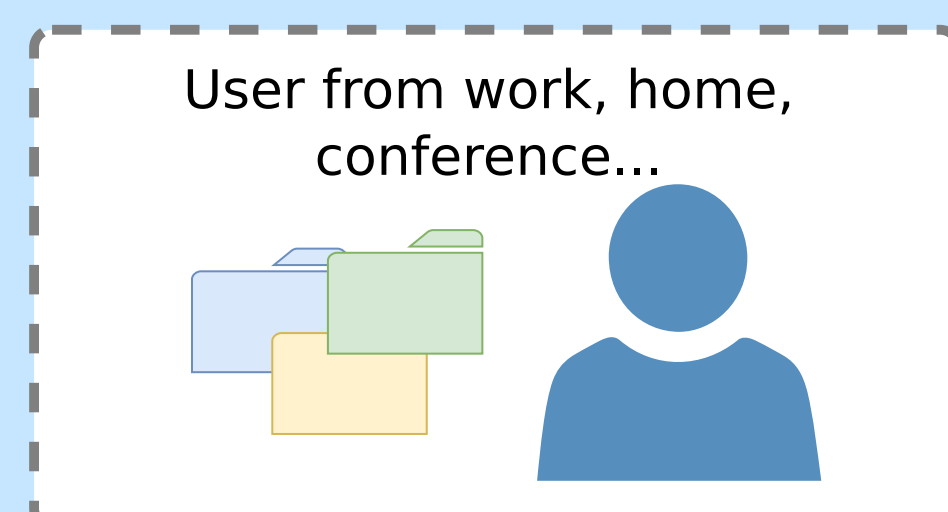
Putting it all together



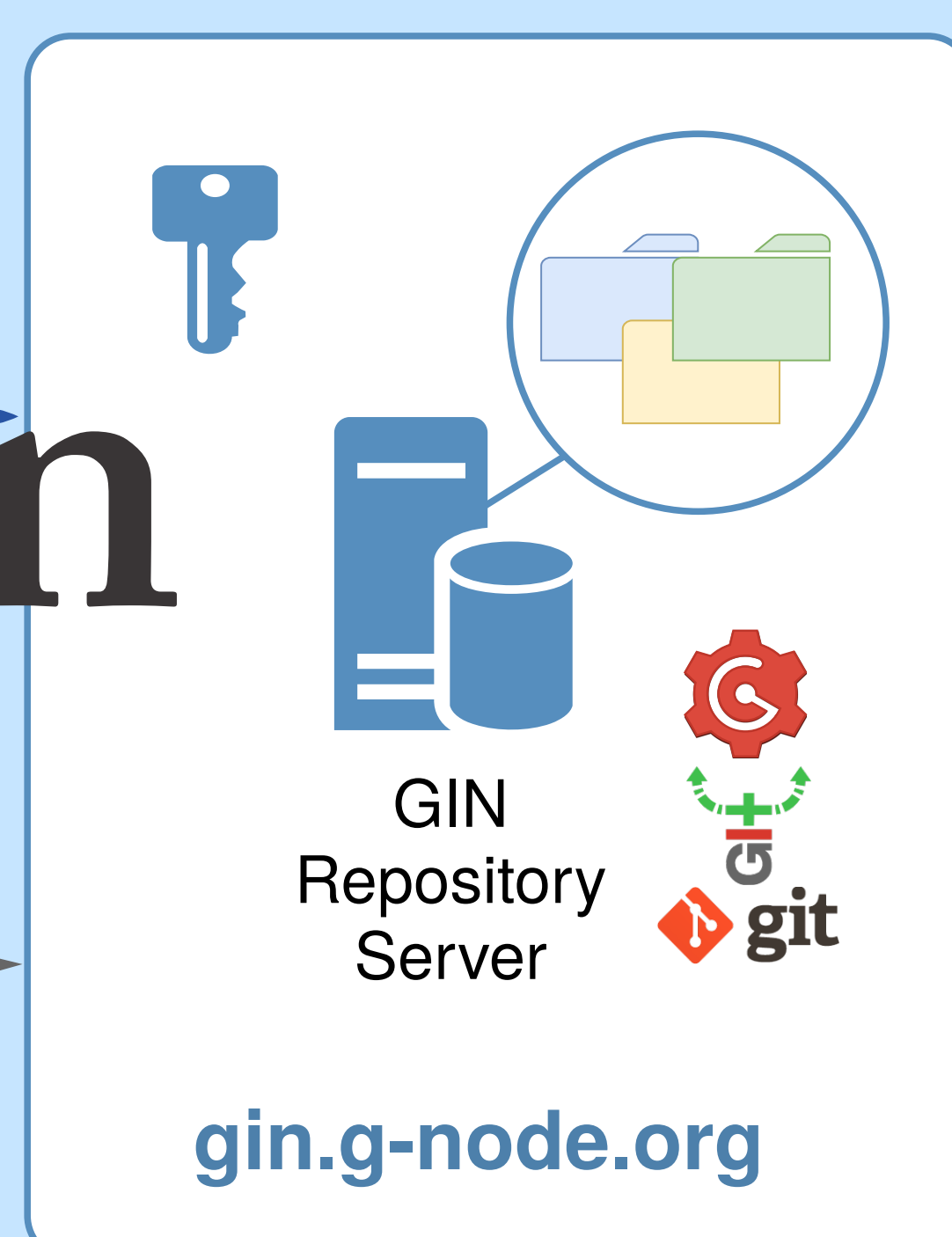
Store data securely; publish and collaborate with ease

GIN Core Features

- Access data from any location
- Backup
- Built-in versioning
- Platform independent
- Secure access
- Public and private repositories

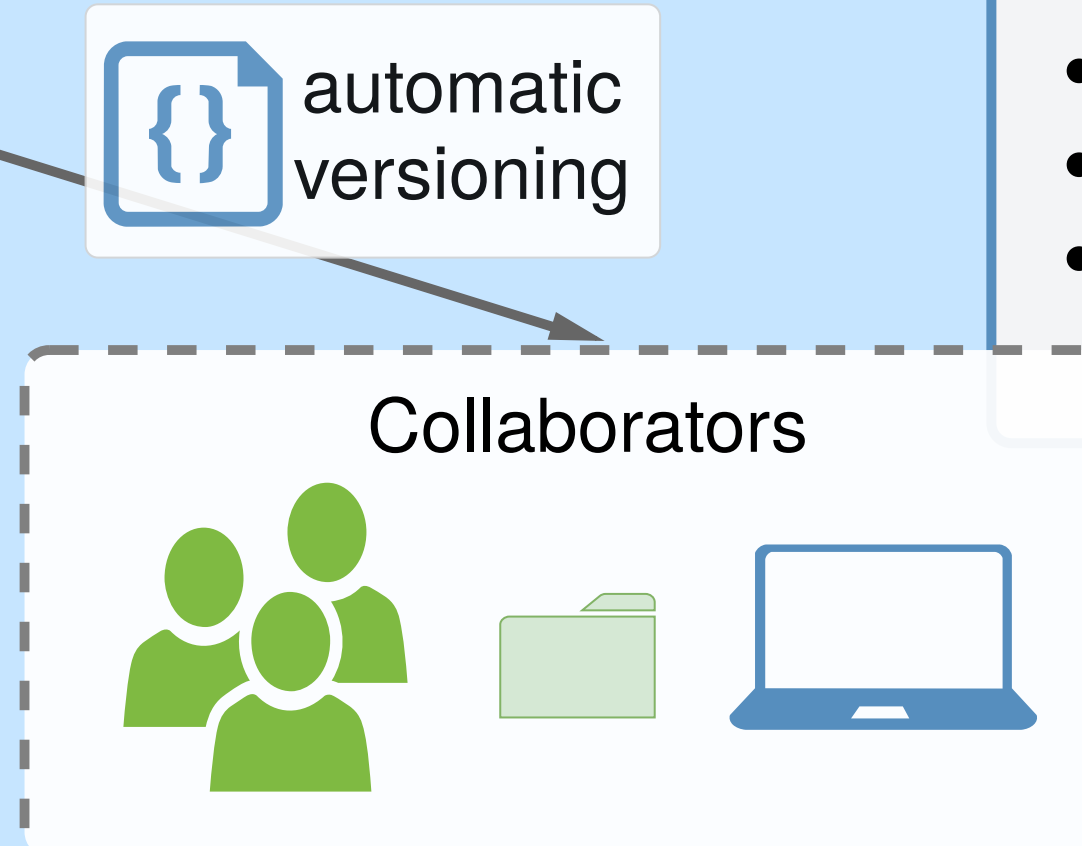


automatic versioning



Coordination and Collaboration

- User management
- User access levels
- On and offsite collaboration
- Online issues help coordination
- Ensure repository integrity with versioning and "Pull requests".

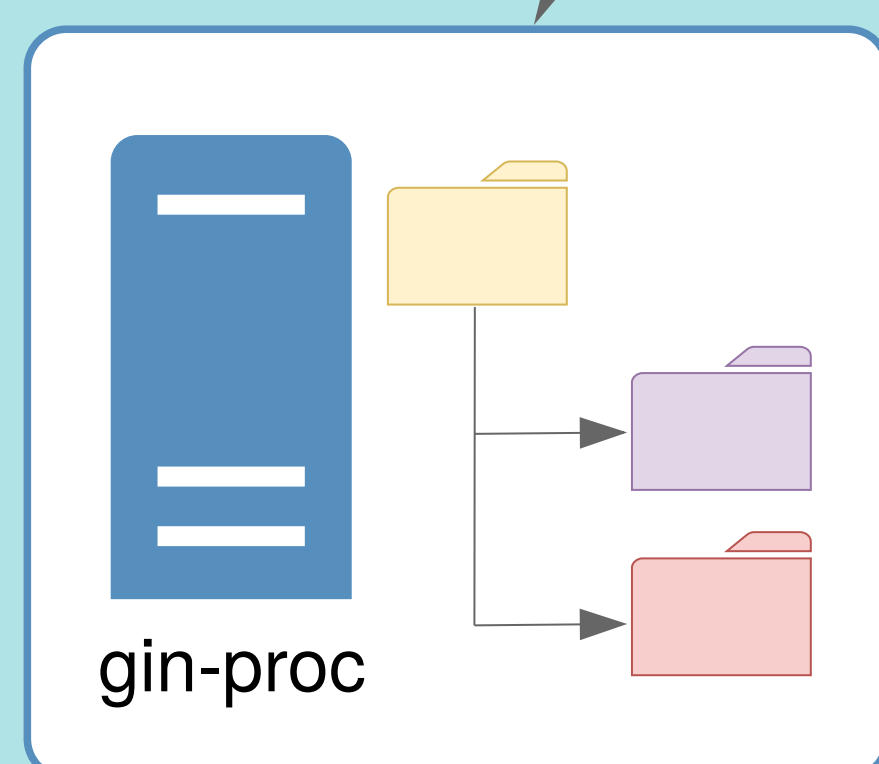


Data Publication and Searchability

Automation and Validation Tools



Data validation service
valid.gin.g-node.org



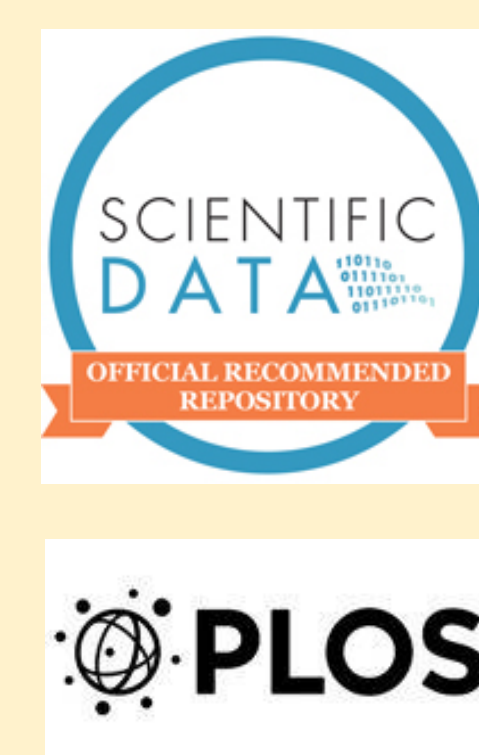
Data processing service
proc.gin.g-node.org



Data search service
gin.g-node.org/explore/data



DOI service
doid.gin.g-node.org



Automated Data Validation

- Automatically runs validation on selected repositories
- Supported validation formats:
 - BIDS
 - odML
 - NIX
- Easily extensible to more formats
- Format validation contributions are welcome

Automated Data Processing

- Automatically runs pre-defined processing pipelines
- Triggered on repository changes
- Automatically returns specified results
- Based on SnakeMake and DroneCI

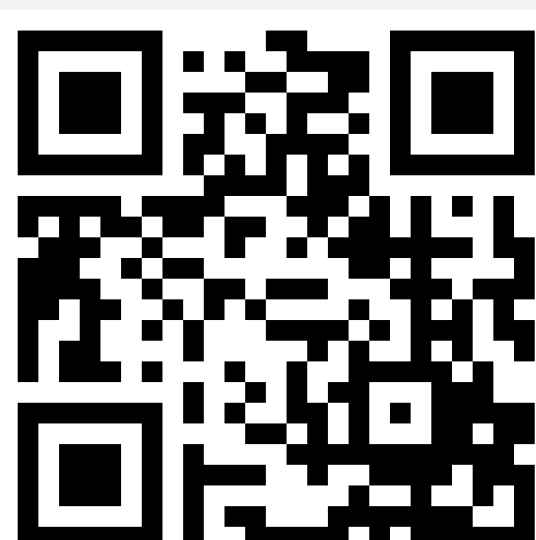
Findable Data via GIN

- GIN provides automatic indexing of all text based files
- Online search for repository content
- Interactive rendering of
 - Markdown
 - YAML
 - JSON
 - XML

Persistent Identifiers

- Any public GIN repository can be registered
- Make your code and data citable
- DOIs for:
 - Data related to publications
 - Research software
 - Whole data sets

Resources and References



Contact:
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Grewe et al (2011), doi:10.3389/fninf.2011.00016
<https://github.com/G-Node/python-odml>
<https://github.com/G-Node/odml-ui>
<https://github.com/INM-6/python-odmltables>
<https://github.com/G-Node/nix>
<https://github.com/G-Node/nixpy>
<https://github.com/G-Node/nix-mx>

<https://gin.g-node.org>
<https://github.com/G-Node/gin-cli>
<https://github.com/G-Node/wingin>
<https://github.com/G-Node/gogs>
<http://neuralensemble.org/neo>
<http://neuralensemble.org/elephant>
<http://bendalab.github.io/NixView>

Supported by BMBF grants
01GQ1302, 01GQ1509