Efficient research data management for reproducible research, collaboration and data publication

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Research data management tasks, including organizing reproducible data workflows in the lab, keeping relevant data and metadata accessible, or exchanging data for collaboration or publication, are becoming increasingly demanding. To reduce the workload associated with data management, we present tools and services that are designed to seamlessly integrate with and support the scientist's lab data workflows. Specifically, these tools address key components of efficient data management: Metadata collection, data organization and storage, as well as sharing and publication.

Collect all information about your experiment

Main features

- Open metadata format [1]
- Flexible hierarchical key-value storage
- Save to common structured formats: XML, JSON, YAML

Validation engine

- automatically validate documents
- define your own data validations

File structure example

```
Document
+-Section
| +-Property-[Values]
+-Section
  +-Section
  | +-Property-[Values]
  | +-Property-[Values]
  +-Section
```

Manage data and metadata in one open, versatile format

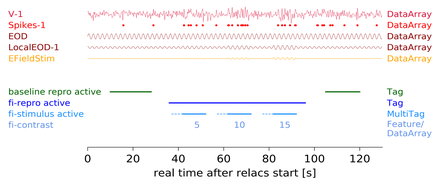
Main features

- Open data format
- Store data, analysis results, and metadata conveniently in the same file
- Descriptive associations between data, analysis results, and metadata
- Built for recording-script automation
- Extract full metadata to separate odML files

Free open source libraries [5]

Integrates with [6,7]

Recording to NIX file: Relacs [8]



Raw and analysed electrophysiology data in the same NIX file

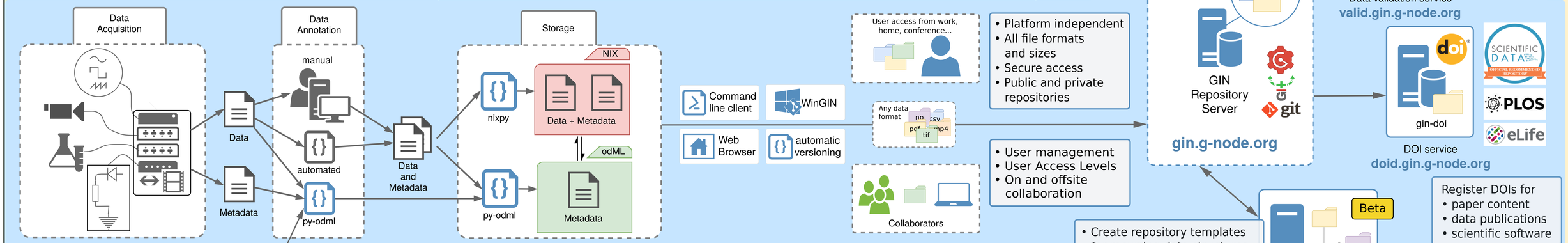
Store data securely; publish and collaborate with ease

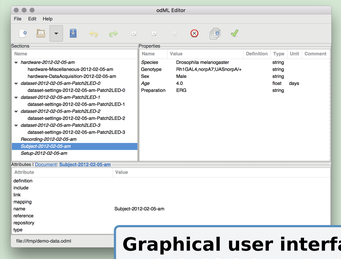
Main features

- Access data from any location
- Free storage for scientific data [10]
- 'Built-in' versioning based on git [11]
- Microservice architecture for easy addition of new services

GIN microservices

- Automatic data validation
- Add custom validations





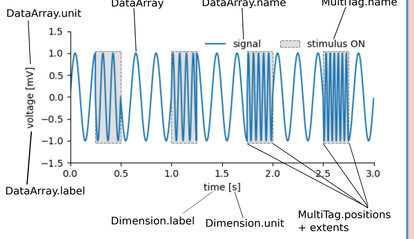
Graphical user interfaces

- odml-ui [3]: browsing and template editing
- odmltables [4]: filtering and tabular export

Re-usable concepts [2]

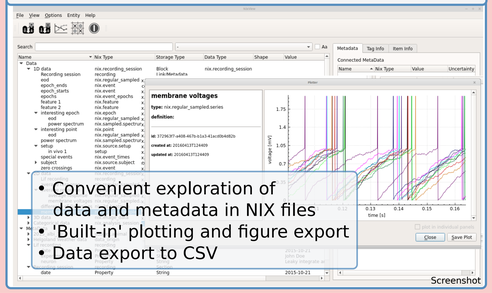
- metadata building blocks
- importable definitions
- file creation automation
- file content standardization

templates.g-node.org
terminologies.g-node.org



Fully annotated file contains all information required to understand and interpret the data and their properties.

NIX View GUI [9]



- Convenient exploration of data and metadata in NIX files
- 'Built-in' plotting and figure export
- Data export to CSV

Screenshot

Resources

[1] Grewe et al (2011), doi:10.3389/fninf.2011.00016
[2] http://www.g-node.org/projects/odml/terminologies
[3] https://github.com/G-Node/odml-ui
[4] https://github.com/INM-6/python-odmltables
[5] http://g-node.github.io/nix
[6] http://neuralensemble.org/neo
[7] http://neuralensemble.org/elephant
[8] https://github.com/relacs/relacs
[9] http://bendalab.github.io/NixView
[10] https://gin.g-node.org
[11] https://git-scm.com
[12] https://github.com/G-Node/tonic

Find out more about G-Node projects at

https://g-node.github.io
https://g-node.github.io/nix
https://g-node.github.io/odml

GIN RRID:SCR_015864
NIX RRID:SCR_016196
odML RRID:SCR_001376

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