
G-Node highlights 2019

... and what they might do for you!

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What do you do in the G-Node?

What do you do in the G-Node?

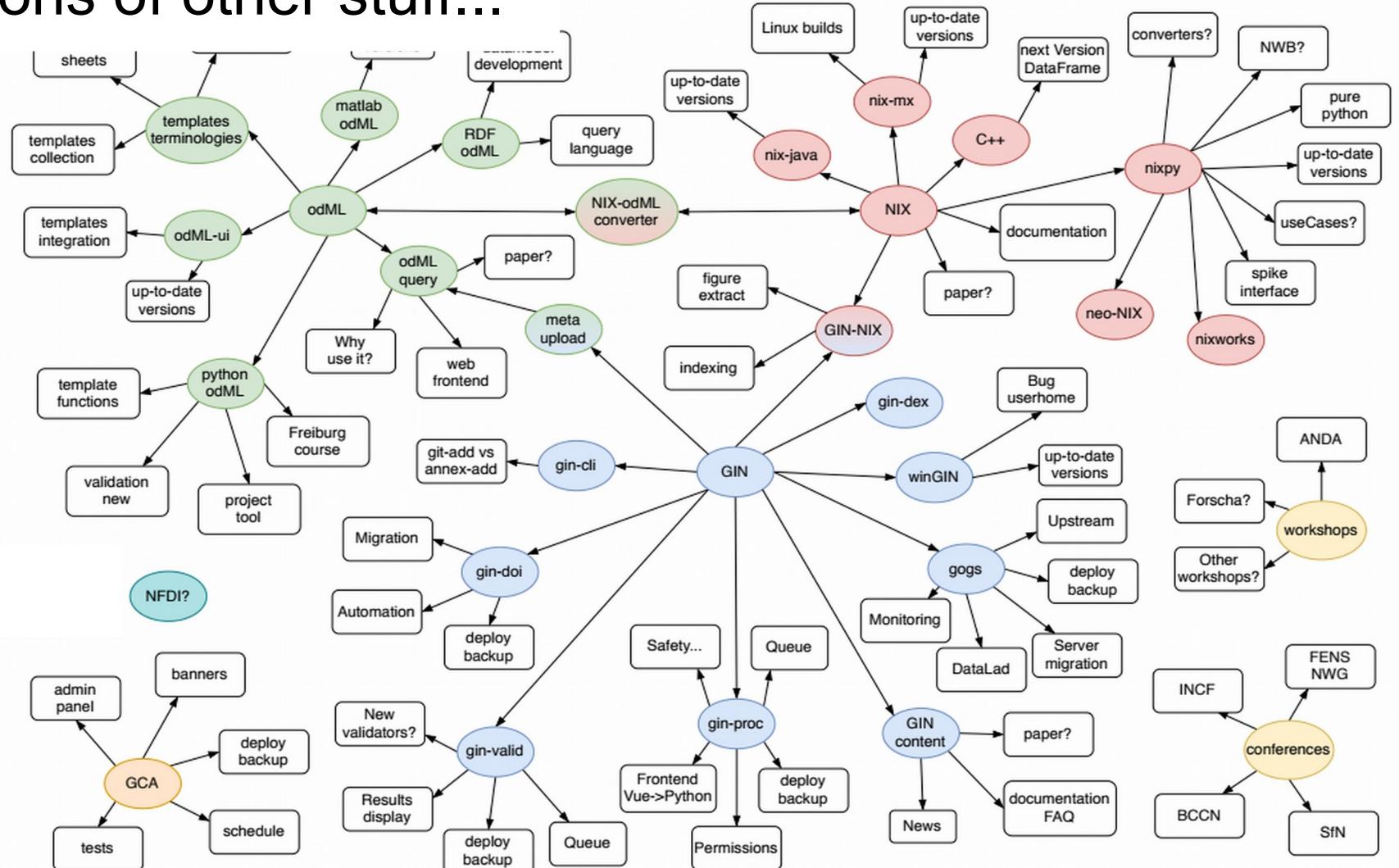
Swag!



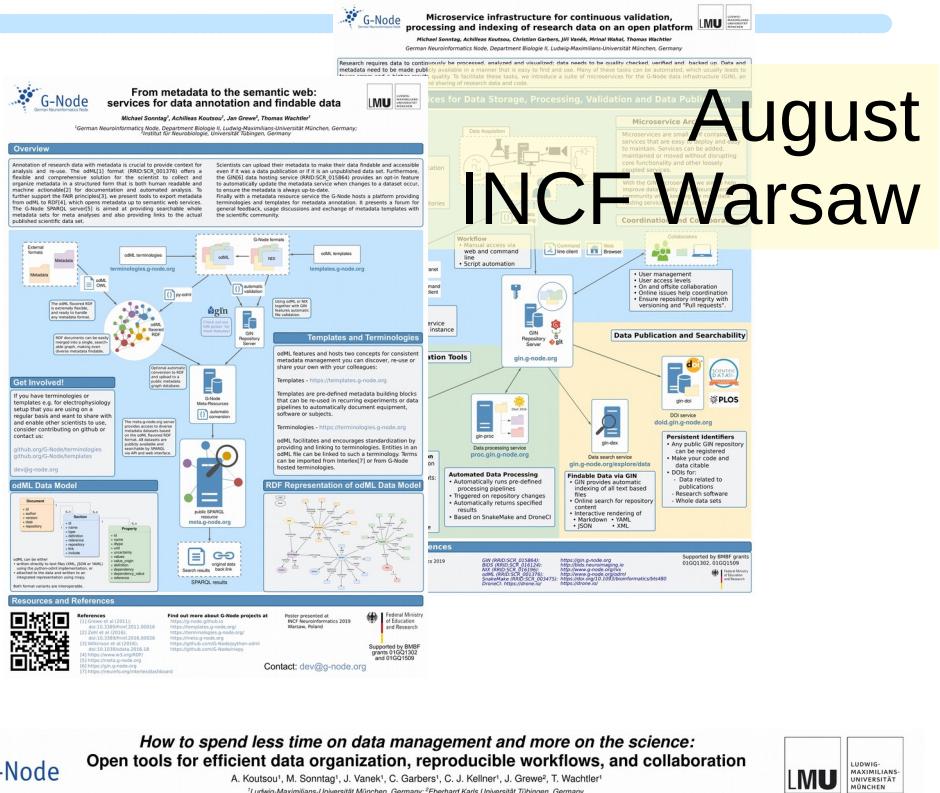
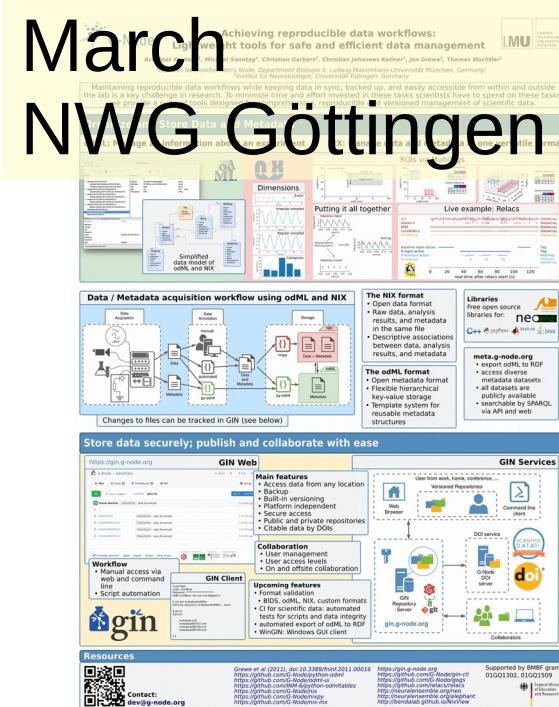
Social hour!

What do you do in the G-Node?

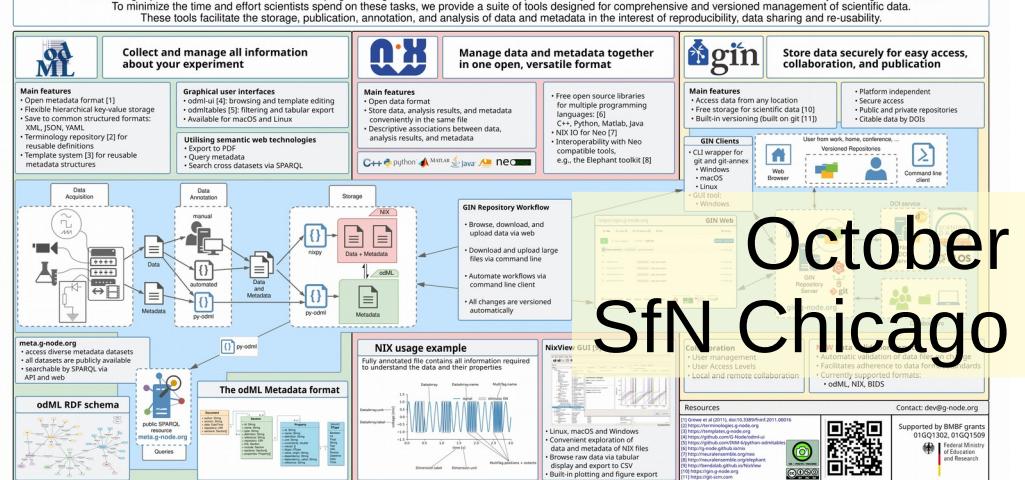
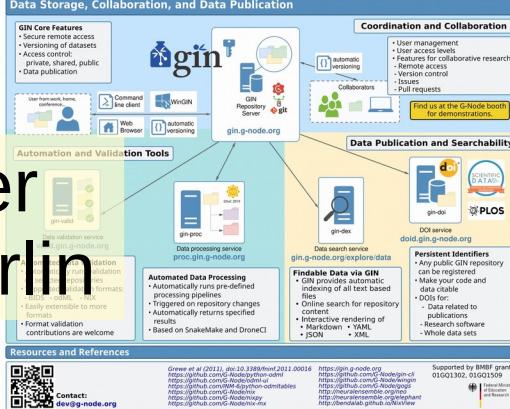
And tons of other stuff...



Conferences 2019



September BCCN Berlin



Brief 2019 intro

- Workshops
 - we want U for science!
- GCA – conference abstracts
- NIX – open data format
- odML – metadata handling
- GIN – data sharing and collaboration
 - Microservices!
- FOSDEM – call for participants

Workshops 2019

- Feb: FZ Jülich
 - GIN microservice collaboration project
 - basics for GSoC project 2019
- Mar: Pilzen – NIX / odML workshop
- April: ANDA – data analysis course
- May: NWB hackathon Janelia Farm
- June: odML workshop Uni Freiburg
- July: Research data management course LMU

Workshops 2020 outlook

- ANDA – Advanced Neural Data Analysis
 - April 13-30
- LMU Research data management course
 - Summer semester 2020
- NFDI Neuroscience
Data management workshop
 - TBA

Workshops 2020 outlook

- ANDA – Advanced Neural Data Analysis
 - April 13-30
 - <https://projects.g-node.org/advanced-course-2020>

Single neuron properties and statistics · Stochastic processes · Surrogate methods · Detection of spatio-temporal patterns · Unitary Events · Statistical analysis of massively parallel spike data · Higher-order correlation analyses · Elephant toolbox · Spike-LFP relationship · Population coding · State space analysis · Machine learning · Data mining · Research data management, reproducibility, data sharing
 - Organizers:

Thomas Wachtler, Sonja Grün, Martin Nawrot

Workshops 2020 outlook

- ANDA – Advanced Neural Data Analysis
 - April 13-30
- LMU Data management course
 - Summer semester 2020
 - University course
 - Research data management
 - Reproducibility
 - Data sharing
 - Organizer: Thomas Wachtler

Workshops 2020 outlook

- ANDA – Advanced Neural Data Analysis
 - April 13-30
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 - Summer semester 2020
- NFDI Neuroscience
Data management workshop
 - TBD

<https://nfdi-neuro.de/#activities>

- NFDI: DFG call

"The aim of the national research data infrastructure (NFDI) is to systematically manage scientific and research data, provide long-term data storage, backup and accessibility, and network the data both nationally and internationally.

The NFDI will bring multiple stakeholders together in a coordinated network of consortia tasked with providing science-driven data services to research communities."

https://www.dfg.de/en/research_funding/programmes/nfdi/index.html

- NFDI: DFG call
- NFDI Neuroscience
 - supported by NWG and BNCN
 - organized by
 - Michael Denker (Forschungszentrum Jülich)
 - Alexandra Stein (Bernstein Coordination Site)
 - Thomas Wachtler (G-Node, Bernstein Facility for Data Technology)

DFG Deutsche
Forschungsgemeinschaft



G-Node Conference Application

Conference abstracts and submission

Login

15th annual meeting of the Ethological Society

We cordially invite you to the historical university town of Tuebingen. This meeting of 100 - 120 participants encourages researchers from any career stage to share and discuss their findings from across all fields in ethology in an informal setting, with plenty of time for social interactions.

Abstract submission October 1 - November 30, 2019

February 18 - 21, 2020



BERLIN
September 17-20, 2019

Bernstein Conference 2019

The Bernstein Conference is the largest annual Computational Neuroscience conference in Europe, attracting an international audience from across the world.

The main conference takes place from September 18-20, 2019. It will be preceded by satellite workshops taking place from September 17-18, 2019.

Contributed talks are selected in a (double-)blind review process. Please see the Conference website for details:
bernstein-conference.de/2019/abstracts

September 17 - 20, 2019



keynotes | panel discussions | demos & posters | socials
neuroinformatics2019.org



Neuroinformatics 2019

The annual INCF Congress provides a meeting place for researchers in all fields related to neuroinformatics. Join us for keynotes from top neuroscientists, community sessions and poster- and demo sessions. Neuroinformatics 2019 comes to Warsaw, Poland and is organized in collaboration with the Polish INCF Node. Welcome to Warsaw!

September 1 - 2, 2019

G-Node Conference Application

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- Free to use for any conference
 - host your own instance or
 - use abstracts.g-node.org



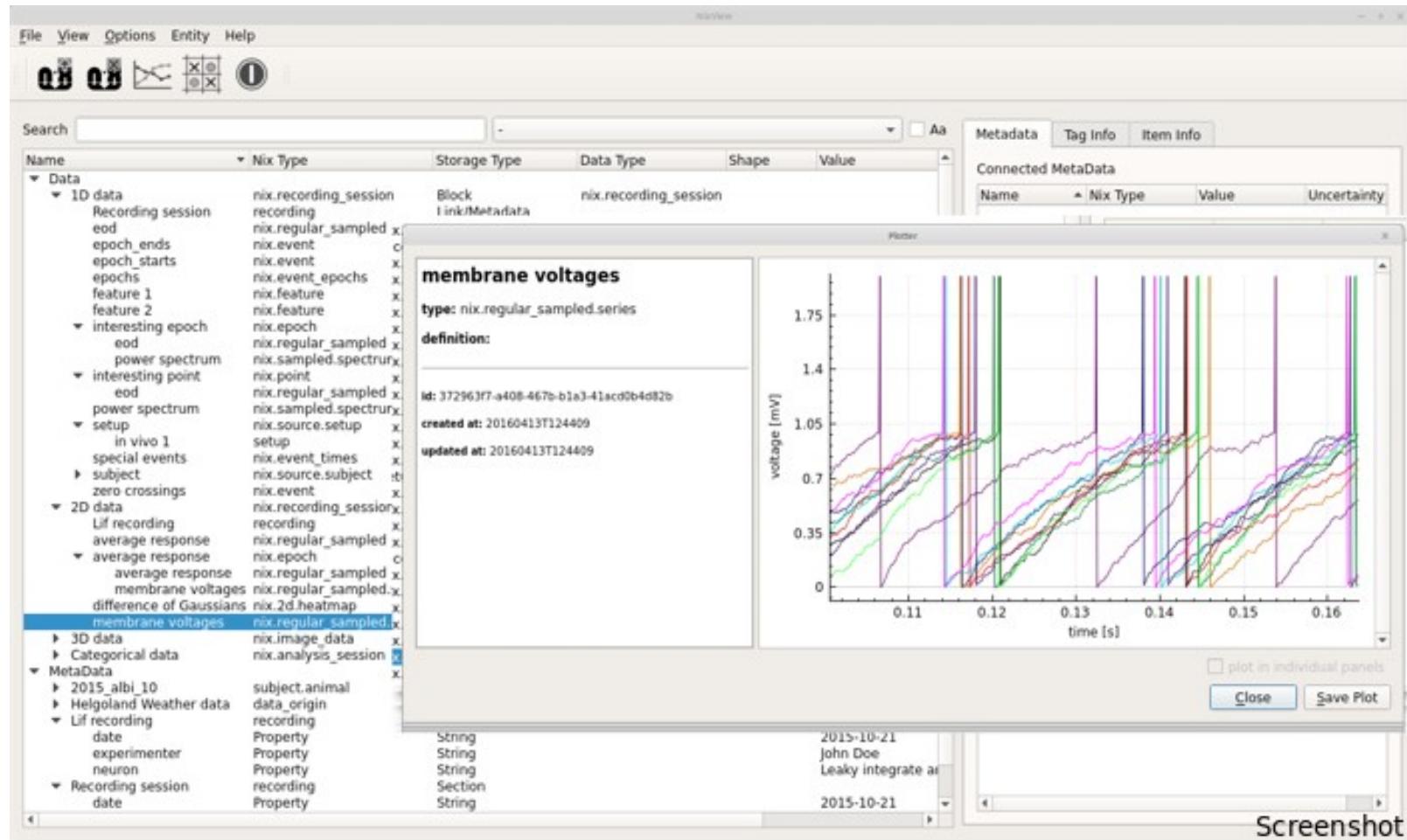
Neuroinformatics

The annual INCF Congress provides a platform for keynotes from top neuroscientists and posters from young researchers. Neuroinformatics 2019 comes to Warsaw, Poland!

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NIX ... Neuroscience Exchange format

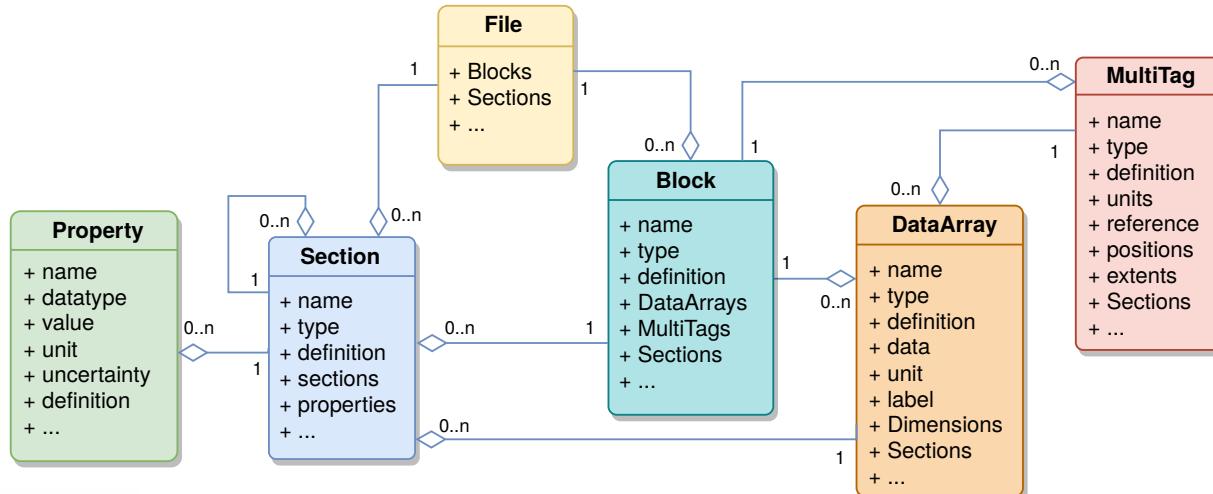


<http://bendalab.github.io/NixView>

<http://g-node.org/nix>

What is it?

- Flexible data model for various kinds of data
- Data and metadata in the same HDF5 file
- Descriptive association between data and metadata
- Multiple language support and tools

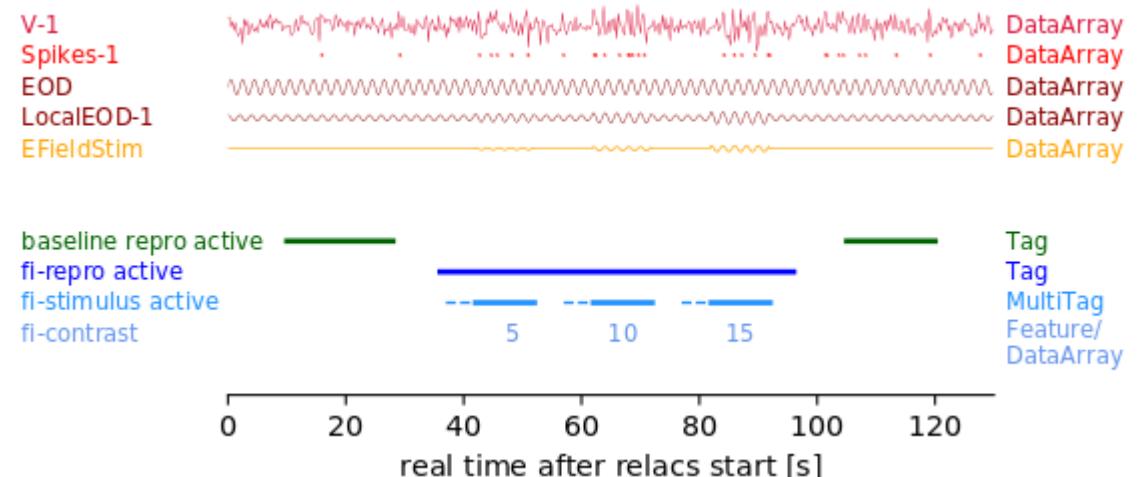
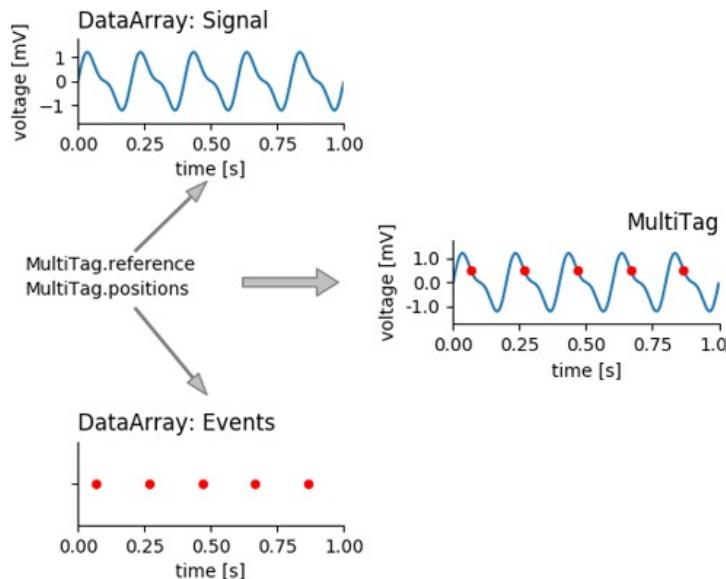




NIX ... overview

What does it do (for me)?

What does it do (for me)?





NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - NIX is used as a storage backend
 - Save supported proprietary formats to NIX

<http://neuralensemble.org/neo>





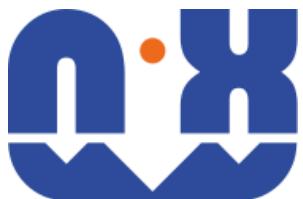
NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - MNE - EEG/MEG data analysis and visualization
 - workshop at Pilzen
 - NIX reader writer integration for the MNE package

<https://mne.tools>



<http://g-node.org/nix>

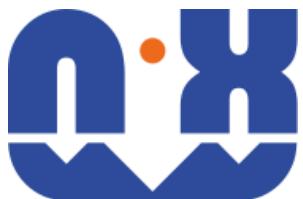


NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - MNE - EEG/MEG data analysis and visualization
 - Neurodata without borders (NWB) format
 - Workshop at Janelia Farm
 - Converter tool between NWB and NIX

<https://www.nwb.org>

<https://github.com/G-Node/nix-nwb>



NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - MNE - EEG/MEG data analysis and visualization
 - Neurodata without borders (NWB) format
 - SpikeInterface (Open ephys)
 - Python package unifying spike sorting algorithms
 - NIX was added as one of the file backend options

<https://open-ephys.org/spikeinterface>





NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - MNE - EEG/MEG data analysis and visualization
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 - SpikeInterface (Open ephys)
 - nixworks
 - Convenience library for retrieving complex data from NIX files with out of the box plotting

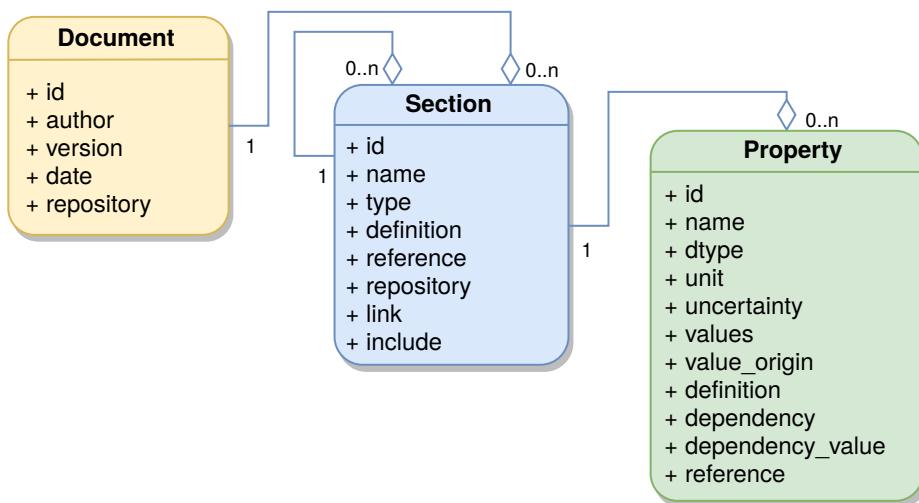
<https://github.com/G-Node/nixworks>



NIX ... new features 2019

- What is new?
 - NEO ephys format reader integration
 - MNE - EEG/MEG data analysis and visualization
 - Neurodata without borders (NWB) format
 - SpikeInterface (Open ephys)
 - nixworks
 - NIX Dataframe prototype
 - save heterogeneous, tabular data

- open metadata markup language
 - store metadata in a common hierarchical format
 - human and machine readable
 - ... automate experiment documentation



```

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



odML ... templates and terminologies

- terminologies: odML building blocks
- templates: reusable odML documents

odML Templates
Data model for storing arbitrary metadata

odML - Templates
This repository contains re-usable odML templates. A general introduction to odML and its usage can be found at the [main odML page](#). A brief introduction can be found at the bottom of the page.

If you would like to contribute and provide a new template to be shared with the community, please open an issue or even create a Pull Request with your template on the corresponding [github repository](#).

1. template:blackrock - type: name: Blackrock
2. template:datasheet - type: name: Datasheet:CRNCS
3. template:datasheet - type: name: Datasheet:G-Node
4. template:eeg/setup - type: name: BASIL
5. template:eeg/setup - type: name: Car-sim
6. template:eeg/setup - type: name: ERP-eeg-response

A brief introduction to odML and metadata
odML (open metadata Markup Language) is a framework, proposed by Grawe et al. (2011), to organize and store experimental metadata in a human- and machine-readable, XML based format (odml). In this tutorial we will illustrate the conceptual design of the odML framework and show hands-on how you can generate your own odML metadata file collection. A well organized metadata management of your experiment is a key component to guarantee the reproducibility of your research and facilitate the provenance tracking of your analysis projects.

What are metadata and why are they needed?
Metadata are data about data. They describe the conditions under which the actual raw-data of an experimental study were acquired. The organization of such metadata and their accessibility may sound like a trivial task, and most laboratories developed their home-made solutions to keep track of their metadata. Most of these solutions, however, break down if data and metadata need to be shared within a collaboration, because implicit knowledge of what is important and how it is organized is often underestimated.

While maintaining the relation to the actual raw-data, odML can help to collect all metadata which are usually distributed over several files and formats, and to store them unitedly which facilitates sharing data and metadata.

Key features of odML

- open, XML based language, to collect, store and share metadata
- Machine- and human-readable
- Python-odML library
- Interactive odML-Editor

odML metadata terminology

Document info
Author:
Date: 2011-01-21
Version: 1.0
Repository: <https://terminologies.g-node.org/v1.1/terminologies.xml>

Structure
[Leaky Integrate and fire \(type: model/lif\)](#)

Content
Leaky Integrate and fire Section
Type: model/lif
Repository: <https://terminologies.g-node.org/v1.1/terminologies.xml>
Link:
Include:
Definition: Properties to describe a leaky integrate and fire neuron model.

| Name | Value | Unit | Type | Definition | Dependency | Dependency Value |
|---------|-------|------|--------|---------------------------|------------|------------------|
| Author | | | person | The author of this model. | | |
| Date | | | date | The simulation date. | | |
| Program | | | string | The program name. | | |

<https://terminologies.g-node.org>

<https://templates.g-node.org>

<http://g-node.org/odml>



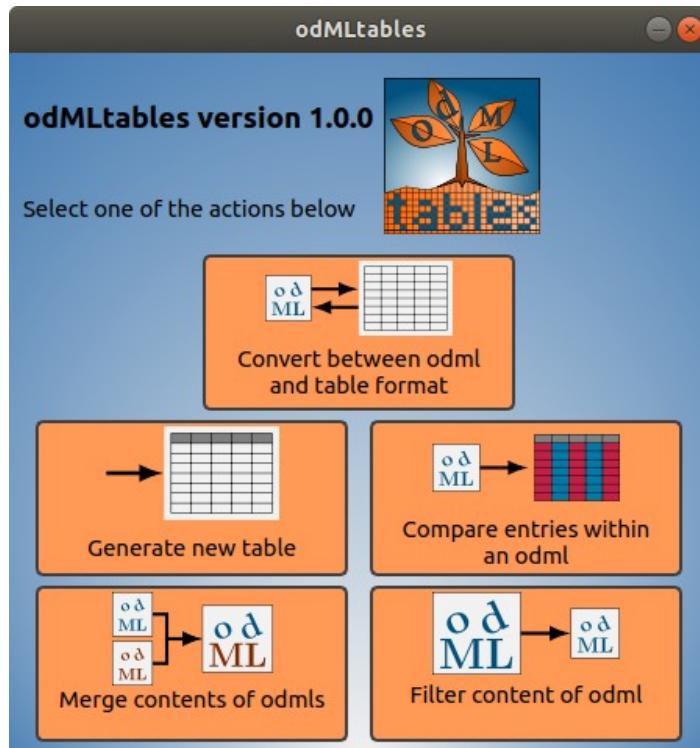
odML ... search across documents

- Added support for RDF
 - ... format to create graph databases
- Heterogeneous data in graph database
- Search via SPARQL query language
- Public server meta.g-node.org
 - free to use and participate
 - free to set up in-lab



odMLtables

odMLtables: A User-Friendly Approach for Managing Metadata of Neurophysiological Experiments.
Sprenger J, Zehl L, Pick J, Sonntag M, Grewe J, Wachtler T, Grün S and Denker M (2019).
Experiments. Front. Neuroinform. 13:62, doi: 10.3389/fninf.2019.00062



Julia Sprenger Michael Denker
FZ Jülich FZ Jülich

<https://odmleTables.readthedocs.io>

<http://g-node.org/odml>



odMLtables

- odMLtables features:
 - command line and GUI
 - odML document filter
 - odML ↔ table conversion
 - odML files comparison



GIN ... G-Node Infrastructure

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GIN

Modern Research Data Management for Neuroscience

...distributed version control, flavoured for science

Manage your research data

Upload your data to private repositories.
Synchronise across devices.
Securely access your data from anywhere.

Share your data

Collaborate with colleagues.
Make your data public.
Make your data citable with the GIN DOI service.

Version your data

Uploaded files are automatically versioned.
Retrieve any previously uploaded version of a file.
Never lose file history.

Open Source

Based on open source projects such as [Git](#), [git-annex](#), and [Gogs](#). You can even set it up in your lab!



Search

[doi / Resolving_and_rescuing_developmental_miswiring_in_a_mouse_model_of_cognitive_impairment](#) 0 0

Updated 1 week ago

[hiobeen / Mouse_hdEEG_ASSR_Hwang_et_al](#) 0 0

A set of high-density EEG (electroencephalogram) recording obtained from awake, freely-moving mice (*mus musculus*).

Updated 1 week ago

[mdp10yy / DCA](#) 0 0

Supplementary Figure 1. Human bile increased afferent firing frequency in mouse proximal colon

Updated 5 months ago

[pgoltstein / Mini1p2pcomparison_Glas_Goltstein_2018](#) 0 0

Dataset of "Benchmarking miniaturized microscopy against two-photon calcium imaging using single-cell orientation tuning in mouse visual cortex". By Annet Glas, Mark Hübener, Tobias Bonhoeffer & Pieter M Goltstein; Max Planck Institute of Neurobiology

<https://gin.g-node.org>



GIN ... G-Node Infrastructure

- Data hosting service
 - Data access from various locations
 - Platform independent
 - Secure access and user management
 - Sharing and collaboration
- Built-in file versioning and retrieval
- Manual and automated workflow integration
- Free to use
- Free in-lab setup

- Neuroscientific service recommended by:



- Statistics
 - 696 (284 public) total repositories
 - 402 users
 - Data size (all repositories): 6.9T



- **gin-doi** <https://doid.gin.g-node.org>
 - 71 published data sets
 - Total published data size: 771G
- **gin-valid** <https://valid.gin.g-node.org>
 - automatic file validation on new data on GIN
 - call for validators!
- **gin-proc**
 - GSoC: google summer of code project
 - prototype for data processing pipeline from GIN



FOSDEM 2020

- FOSDEM @ Brussels
 - ... Free open source developers' european meeting



FOSDEM 2020

- FOSDEM @ Brussels
 - ... Free open source developers' european meeting
 - Belgian beer
 - free to attend
 - get in touch with other developers and projects
 - get the latest developments in the free/open software world
 - free talks and presentations by project leaders and committers
 - promote development and benefits of open source

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- Cool, but ... why?

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FOSDEM 2020

- Devroom at FOSDEM
 - Open Research Tools & Technologies
 - How to bring OS dev and scientists together



Organizers:

- Paul Girard, Sciences Po médialab
- Mathieu Jacomy, Aalborg University TANT Lab
- Achilleas Koutsou, G-Node

<https://research-fosdem.github.io>

<https://fosdem.org>

FOSDEM 2020

- Devroom at FOSDEM
 - Open Research Tools & Technologies
 - How to bring OS dev and scientists together
- Take part! Have a talk about your stuff!
 - Deadline: 30.11.2019

<https://penta.fosdem.org/submission/FOSDEM20>

<https://research-fosdem.github.io>

<https://fosdem.org>

G-Node Contributors 2019

Star contributors 2019



Jan Grawe
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Chek Yin Choi
TUM



Julia Sprenger
FZ Jülich



Michael Denker
FZ Jülich

G-Node



Thomas Wachtler
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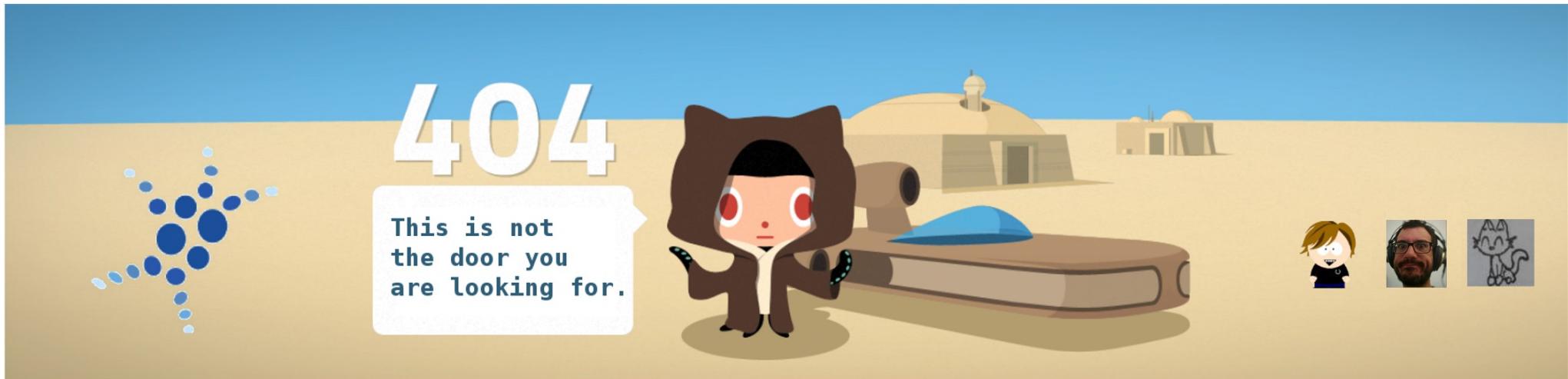


Achilleas Koutsou
LMU



Michael Sonntag
LMU

/dev/null



questions -> /dev/null

or

Room B01.063
always open (>10:00)

dev@g-node.org