

MNE-BIDS and MNE-BIDS-Pipeline Tutorial

Máté Aller

COGNESTIC 2023

27/09/2023

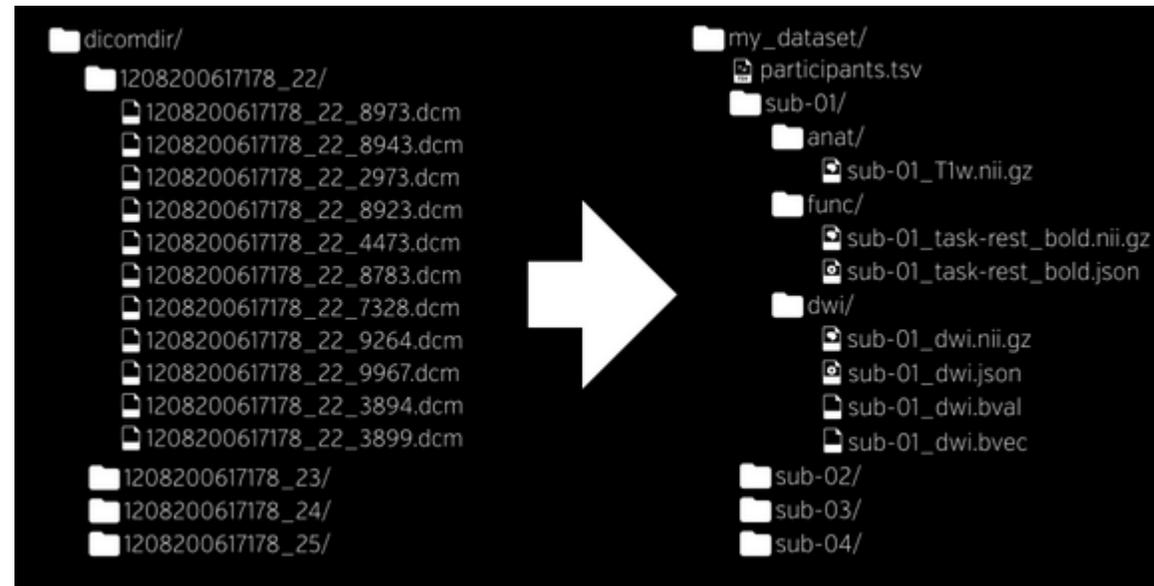
Outline

- Brain Imaging Data Structure (BIDS)
- MNE-BIDS
- MNE-BIDS-Pipeline
- Code demo throughout

Brain Imaging Data Structure

A simple and intuitive way to organize and describe your neuroimaging and behavioral data.

ABOUT NEWS BENEFITS ▾ SPECIFICATION GET STARTED GET INVOLVED GOVERNANCE ACKNOWLEDGMENTS



MEG, EEG, iEEG support included!

<https://bids.neuroimaging.io/>

<https://bids-specification.readthedocs.io/en/stable/>



MEG + EEG ANALYSIS & VISUALIZATION

Open-source Python package for exploring, visualizing, and analyzing human neurophysiological data: MEG, EEG, sEEG, ECoG, NIRS, and more.

Source Estimation

Distributed, sparse, mixed-norm, beamformers, dipole fitting, and more.

Machine Learning

Advanced decoding models including time generalization.

Encoding Models

Receptive field estimation with optional smoothness priors.

Statistics

Parametric and non-parametric, permutation tests and clustering.

Connectivity

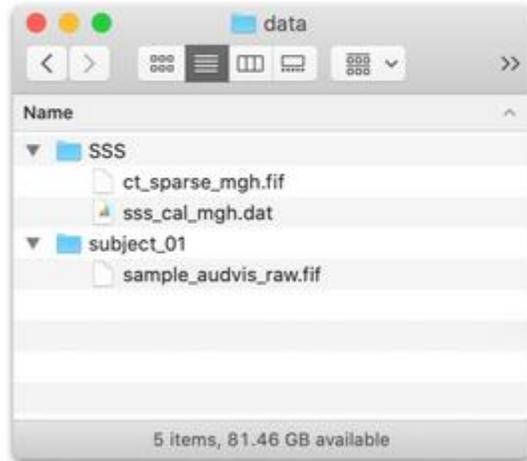
All-to-all spectral and effective connectivity measures.

Data Visualization

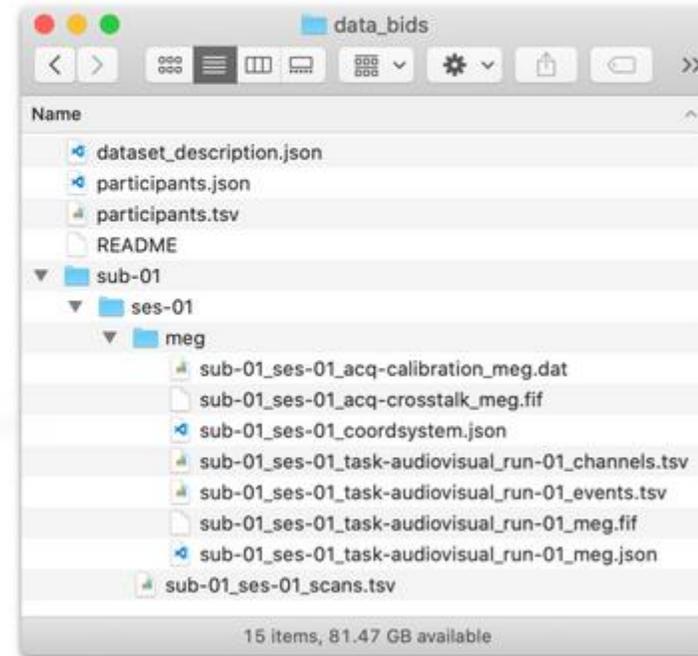
Explore your data from multiple perspectives.

MNE-BIDS

MNE-BIDS is a Python package that allows you to read and write BIDS-compatible datasets with the help of [MNE-Python](#).



Arbitrarily organized data



BIDS-compliant dataset



What is MNE-BIDS-Pipeline?

MNE-BIDS-Pipeline is a full-fledged processing pipeline for your MEG and EEG data.

- It operates on data stored according to the [Brain Imaging Data Structure \(BIDS\)](#).
- Under the hood, it uses [MNE-Python](#).

[Get started](#)

[Learn more](#)



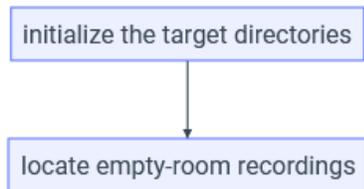
What the pipeline offers

- 🏆 Automated processing of MEG and EEG data from raw data to inverse solutions.
- 🛠️ Configuration via a simple text file.
- 📖 Extensive processing and analysis summary reports.
- 👥 Process just a single participant, or as many as several hundreds of participants – in parallel.
- 💻 Execution via an easy-to-use command-line utility.
- 🆘 Helpful error messages in case something goes wrong.
- 🤖 Data processing as a sequence of standard processing steps.
- ▶️ Steps are cached to avoid unnecessary recomputation.
- 📤 Data can be "ejected" from the pipeline at any stage. No lock-in!
- ☁️ Runs on your laptop, on a powerful server, or on a high-performance cluster via Dash.

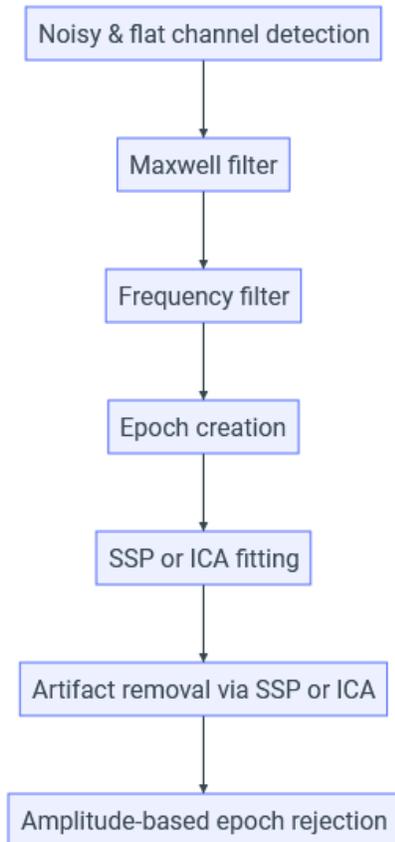
[Get started](#)

<https://mne.tools/mne-bids-pipeline/1.4/index.html>

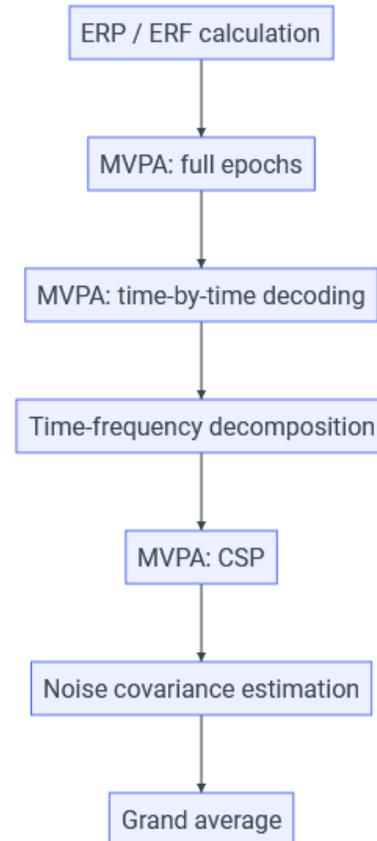
📁 Filesystem initialization and dataset inspection



🖌️ Preprocessing



📡 Sensor-space processing



🧠 Source-space processing

