

BIDSme: expandable BIDS-ifier of brain imagery datasets

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Introduction

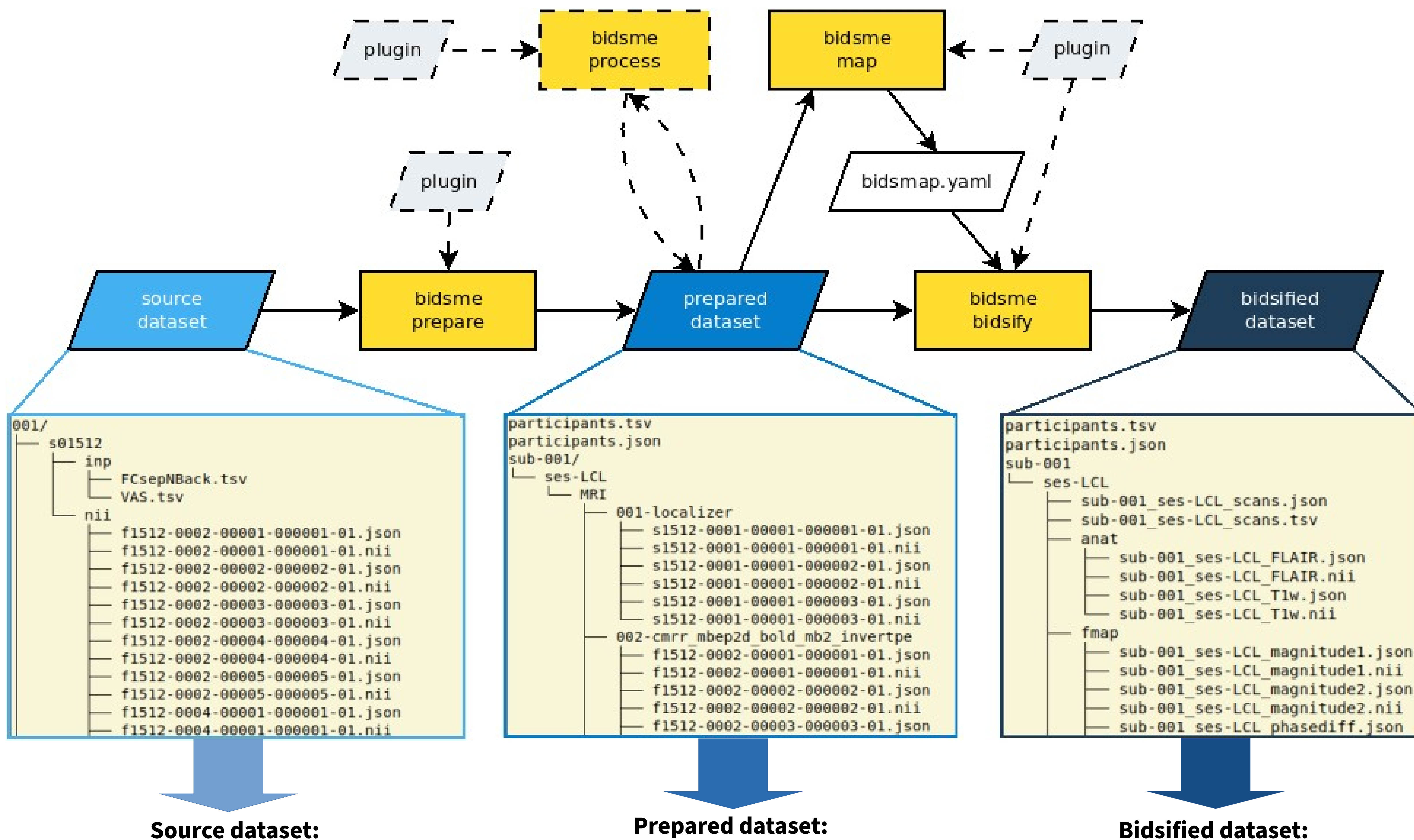
For a long time, the neuroimaging community suffered from a lack of standardized file structure, formats and metadata conventions. Different laboratories had their own, idiosyncratic ways to organize data. Analyses were then performed with scripts tailored to specific data structures, which made analysis workflow and data sharing unnecessarily complicated. Consequently, it was difficult to ensure results repeatability and validation.

The **BIDS**[1] was introduced to change this situation; it imposes a standard data structure and defines the required associated metadata. Once a dataset follows the imposed structure, any analysis tool, supporting BIDS formatting, should be able to automatically find the needed data to process. Moreover, BIDS-formatted data are self-consistent and complete, i.e. all data and metadata necessary for their processing are included and explicitly defined, thus allowing easier reuse and sharing with others.

Results

BIDSme can be used both as Python package and command-line tool. During the data organization, BIDSme provides the user with the full control over these processes, allowing the use of non-standard metadata and file names, as well as the addition of modalities not yet described by the BIDS. Instead of strictly imposing this structure, BIDSme allows the user to fully configure how the source dataset will be organized and what metadata will be included.

The workflow of bidsification using BIDSme is depicted in the Figure.



Source dataset:

Raw, unorganized dataset, mix of:

- MRI
- PET
- EEG
- Excel tables, log files

Prepared dataset:

Pre-organized dataset with files sorted by:

- Subject
- Session
- Modality
- Acquisition sequence

Data files stored in original format

Bidsified dataset:

Fully organized dataset with files sorted by:

- Subject
- Session (if any)
- Data type

Data files renamed following BIDS
Metadata formatted following BIDS

Aim

To develop a tool to organize complex, multimodal imaging datasets following BIDS standard

Methods

We developed an open-source python tool under GPL-2 license and freely available on GitHub (<https://github.com/CyclotronResearchCentre/bidsme>). We designed the tool to be an all-in-one organizer tool, that not only renames and re-structures the original data files, but also extracts and formats the necessary metadata. We provided a tutorial and test dataset, and a companion scientific paper [2]. The tool complies with the latest version of BIDS (schema v1.10).

Features

Bidsmap:

Configuration file directing bidsification

- Identifies data using metadata
- Defines bidsified name
- Defines BIDS metadata

Plugins:

Custom Python functions to adapt to a particular dataset:

- Rename subjects/sessions
- Fill participants data
- Verify dataset validity
- Fill missing metadata

BIDS schema:

Uses official BIDS schema for validation of bidsification

Download



BIDSme:



Template:

Data formats

DICOM, ECAT, NifTI+ JSON (SPM, dcm2nii), Bare NifTI, EDF/EDF+/BrainVision

References

1. Gorgolewski et al. *Scientific Data*, 3(160044)
2. Belyi et al. *Journal of Open Source Software*, 8(92), 5575