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How to Upload Your fMRI Data to OpenNeuro and Download Datasets from Others

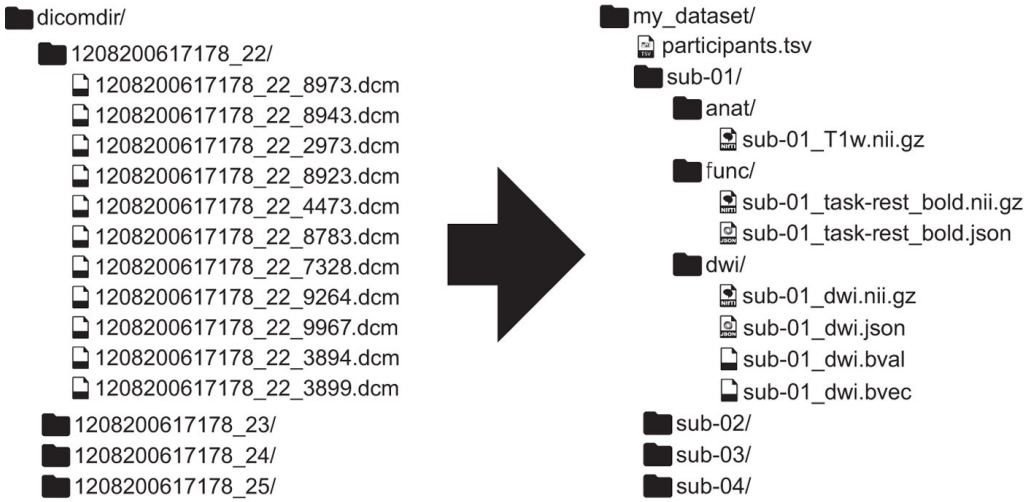
Overall introduction + BIDS

This is a step-by-step, how-to guide for uploading your raw data to OpenNeuro, to freely store and share Brain Imaging Data Structure (BIDS) datasets. While no explicit storage limit is specified, datasets as large as 750 GB are currently available on the platform.This guide builds upon the guide provided by OpenNeuro: https://docs.openneuro.org/user_guide.html.

Neuroimaging studies produce complex data that can be organized in many ways. With no standard format, even researchers in the same lab might structure their data differently. The Brain Imaging Data Structure (BIDS) was created to solve this problem by offering a simple, consistent way to organize and share neuroimaging and behavioral data.

The BIDS data structure is as follows:

- Each dataset starts with a main folder named after the study.
- Inside, each participant has their own folder (e.g., sub-01, sub-02).
- Within each participant's folder, data are grouped by type, like anat for structural scans, func for functional scans, or beh for behavioral data.
- Files follow a specific naming pattern that includes the participant ID, task name, and data type (e.g., sub-01_task-rest_bold.nii.gz).
- A few key text files in the main folder (like dataset_description.json and participants.tsv) describe the dataset and participants.



For more information about BIDS, you can visit this Nature paper.

Register your data

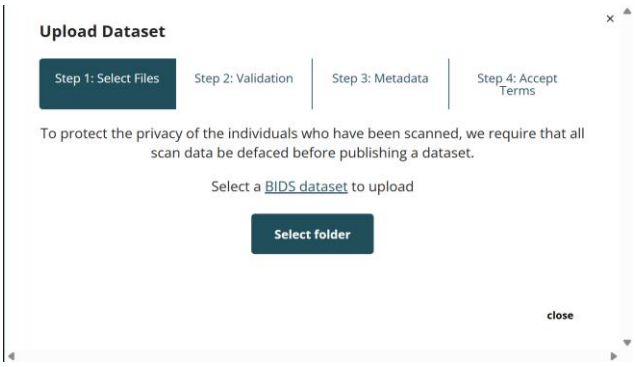
Once you have organized your data according to the BIDS format, your remaining job becomes easy.

First, let's visit OpenNeuro.

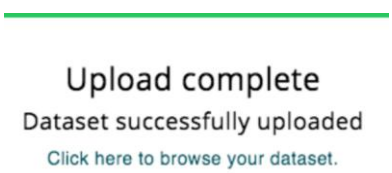
Make sure you've signed up for an OpenNeuro account before uploading your data.

1. Click the **Upload** button in the top-right corner of the page.

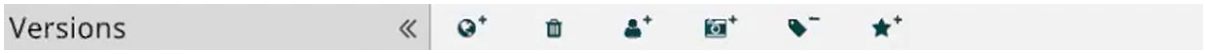
2. You'll then be guided through four simple steps to upload your dataset.



3. You will upload your entire **folder**, where your data is organized under the BIDS structure.
4. Then, the **validation** will make sure your data is formatted according to the BIDS structure. If it is not, errors will be raised. You may submit your data with warnings, but all errors must be resolved.
5. The next step is to fill out the **metadata form**, which includes important information that isn't directly available from the dataset itself. While this step is optional, it's highly recommended as it helps others find and understand your dataset more easily.
6. Finally, you'll need to accept the **Terms and Conditions** and confirm that the data has either been defaced or that you have consent to share it publicly. Defacing means the removal of any facial features such as nose, eyes, mouth and jawline, for example with PyDeface. In practice, the data collected from fMRI facilities have often been defaced a priori. Once confirmed, the dataset will start uploading in the background. You can continue using the site, but don't close or reload the page, or the upload will stop. When the upload is complete, a notification will appear in the bottom-right corner of the screen:



Once your dataset is uploaded, you can manage it (e.g., edit metadata, add files, or make changes). Note that uploading the dataset does **not** make it public right away – you must explicitly choose to publish it when you're ready, by clicking on the globe symbol in your dataset page.



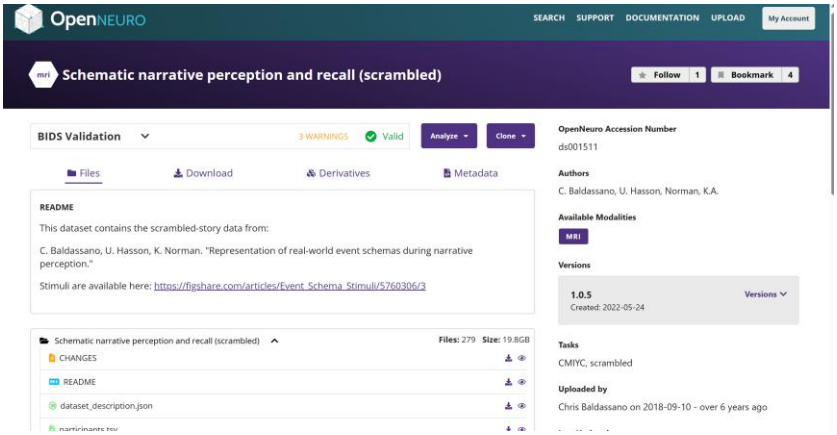
Downloading your own and others' datasets

This process involves the use of DataLad and requires Python + GitHub.

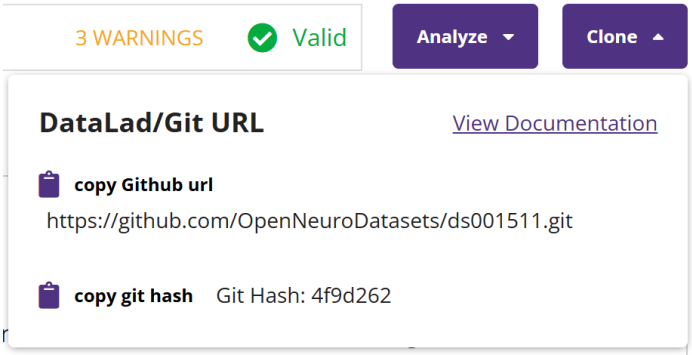
1. First, navigate to the search tab:

   Then, you can freely search for your required data, based on data type or keywords.

   Once your data is selected, it will look something like this:

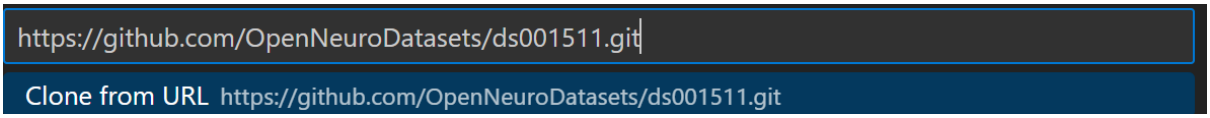


2. Press the clone button and copy the GitHub URL.

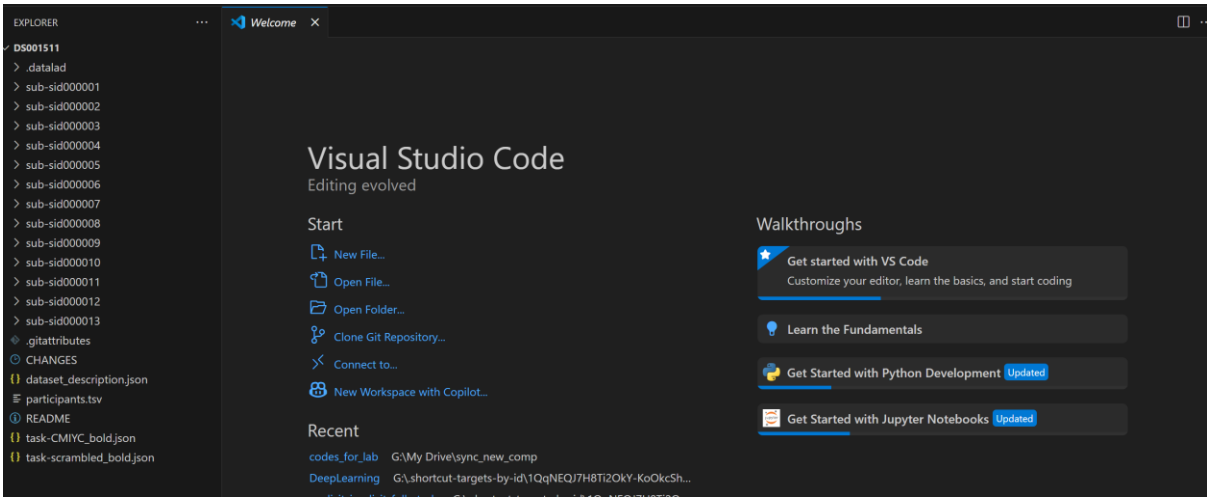


3. Open the Python platform of your choice; in this example, we will use Visual Studio Code (VS Code).
4. This step may vary by platform (for a more general handbook on DataLad, visit this link), but in VSCode, press Ctrl + Shift + P to open the command palette. Then type and select "Git: Clone" from the list.

Then, we will copy the URL we previously copied from OpenNeuro and press the Return key:

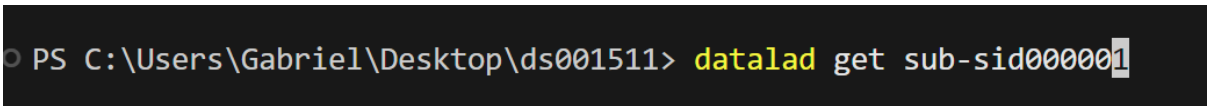


You'll be asked to choose a location to save the dataset. At this point, the actual data files haven't been downloaded yet—only the dataset structure has been cloned to your computer. After downloading the files with DataLad, you can open the folder, which will now contain the full dataset and look like this:



5. Now, we can use DataLad. Make sure the DataLad library is downloaded on your platform using pip/conda install (e.g., by writing in the terminal: "pip install datalad").

   To download the data, we specify which files we want to retrieve. In this example, we'll download only the first subject. If you'd like to download the entire dataset, navigate to the dataset folder and run "datalad get ."



Once the download is complete, your data will be ready for use and analysis.