



OpenNeuro

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What is OpenNEURO ?

An open platform for sharing and analyzing
neuroimaging data, enabling reproducible
neuroscience research.

**Designed to facilitate the open sharing of datasets, OpenNeuro supports a variety of neuroimaging data formats, including MRI, fMRI, MEG, and EEG.*





Why OpenNeuro?

- **Large, Diverse datasets:** MRI, fMRI, MEG, EEG
- **Standardized:** BIDS format for easy integration.
- **Integration:** Works seamlessly with Python and can be downloaded directly.
- **Reproducibility:** Open access ensures ease of research validation.





Datasets

- Originally launched as **OpenfMRI** in 2010, focusing on fMRI datasets.
- Rebranded as **OpenNeuro** in 2017 to support a wider range of neuroimaging data, including MRI, fMRI, MEG, and EEG.
- Hosts **over 600 public datasets** contributed by researchers worldwide.
- Has continuous growth with new datasets regularly added, making it a central hub for sharing neuroscience data.





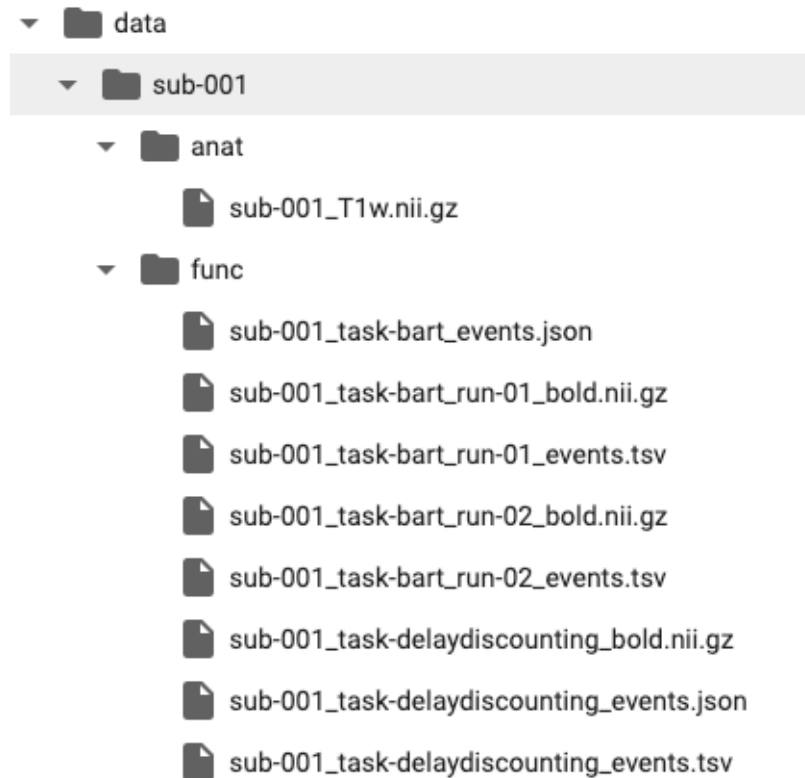
BIDS Format

- OpenNeuro uses the **BIDS** (Brain Imaging Data Structure) format to ensure consistency across datasets.
- Example of a BIDS structure:
 - **Subject folders** (e.g. `sub-001`) organize data.
 - Subfolders like `anat` for anatomical scans, `func` for functional data (fMRI), with corresponding files (`.nii.gz`, `.json`, `.tsv`).
- BIDS ensures datasets are **easy to understand** and **compatible with various tools**.





BIDS Format (cont.)





Common File Types in BIDS

- **.nii**: **NIfTI** (Neuroimaging Informatics Technology Initiative), a standard file format used for storing neuroimaging data like MRI and fMRI scans. The **.nii** format holds the brain imaging data in a 3D or 4D array.
- **.gz**: A compressed version of files (e.g. **.nii.gz**); commonly used to reduce the size of large **.nii** files for easier storage and transfer, while maintaining the original data integrity.
- **.json**: Stores **metadata** that describes how the neuroimaging data was acquired (e.g. scanner settings, subject details). This information is important for ensuring data reproducibility and understanding the conditions under which the data was collected.
- **.tsv**: Tab-separated value files used to store **event-related information** (e.g. the timing of specific stimuli or tasks in an experiment), commonly associated with fMRI data and help link the recorded brain activity to behavioral or experimental events.





Integration with Python

- OpenNeuro datasets can be directly accessed via Python using the `openneuro` package.
- Here's an example of how to import and download a dataset:

```
import openneuro


dataset = openneuro.Dataset("ds000001")
dataset.download(destination="path")
```









OpenNeuro Dataset Page

The [OpenNeuro dataset page](#) for the dataset with Accession Number **ds004711**.

 **AgeRisk**

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README
BACKGROUND


This dataset contains magnetic resonance imaging data (N=187) from a sample of healthy human participants between 16 and 81 years of age. The neuroimaging session was conducted as part of a cross-sectional study (AgeRisk) of the developmental trajectories of risk preference, impulsivity, and self-control. The neuroimaging session was conducted as the last of three study sessions, and comprised a structural (T1w) scan, as well as functional scans during completion of the Balloon Analogue Risk Task (2 runs) and a delay discounting paradigm. Due to time constraints, the delay discounting task was completed by 178 out of 187 participants. This dataset was collected between 2016 and 2017 at the University Hospital Basel, Switzerland. The dataset was skull stripped prior to uploading using the FSL Brain Extraction Tool. For detailed descriptions of the sample, study design and materials, consult the JSON sidecar files as well as the references below.

[READ MORE](#)


OpenNeuro Accession Number
ds004711

Authors
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Available Modalities
[MRI](#)

Versions
1.0.0 [Versions](#) 
Created: 2023-08-23

Tasks
bart, delaydiscounting

Uploaded by
Loreen Tisdall  on 2023-08-23 - about 1 year ago





Accession Number

The **Accession Number** is a unique identifier for each dataset on OpenNeuro. This number can be on the dataset's page, usually in the **URL** or in the **dataset header**.

For example, the dataset **ds004711** has its accession number as part of the URL: <https://openneuro.org/datasets/ds004711/> You will use this number with the **openneuro** Python package to download data,

```
import openneuro as on  
on.download(dataset = "ds004711", destination="path")
```





AgeRisk Dataset

This dataset contains neuroimaging data (N=187) from participants aged 16 to 81 years, collected as part of the AgeRisk study.

The **neuroimaging session** included:

- **Balloon Analogue Risk Task (BART):**
 - Conducted in **2 runs**, this task assesses risk-taking behavior.
 - Participants inflate a balloon to earn rewards but risk popping the balloon and losing points.





AgeRisk Dataset (cont.)

- [Delay Discounting Task](#):
 - Completed by **178 participants**, it measures impulsivity and self-control.
 - Participants choose between smaller, immediate rewards or larger, delayed rewards.

The dataset includes:

- **Structural scans** (T1w images)
- **Functional scans** during the tasks





Dataset Details

- Data was collected between *2016 and 2017* at the University Hospital Basel, Switzerland.
- **Preprocessing:** The dataset was skull stripped using the FSL Brain Extraction Tool (BET).
 - **Skull stripping** is the process of removing non-brain tissue (e.g. the skull, scalp, etc.) from MRI images to isolate the brain.
 - Helps reduce noise and irrelevant data, ensuring the focus remains on the brain structures.
- More information is contained in the *JSON sidecar files* included in the dataset.





Questions?

