

# Brain Imaging Data Structure

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# Meet Prof. Smith

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# Meet Mike

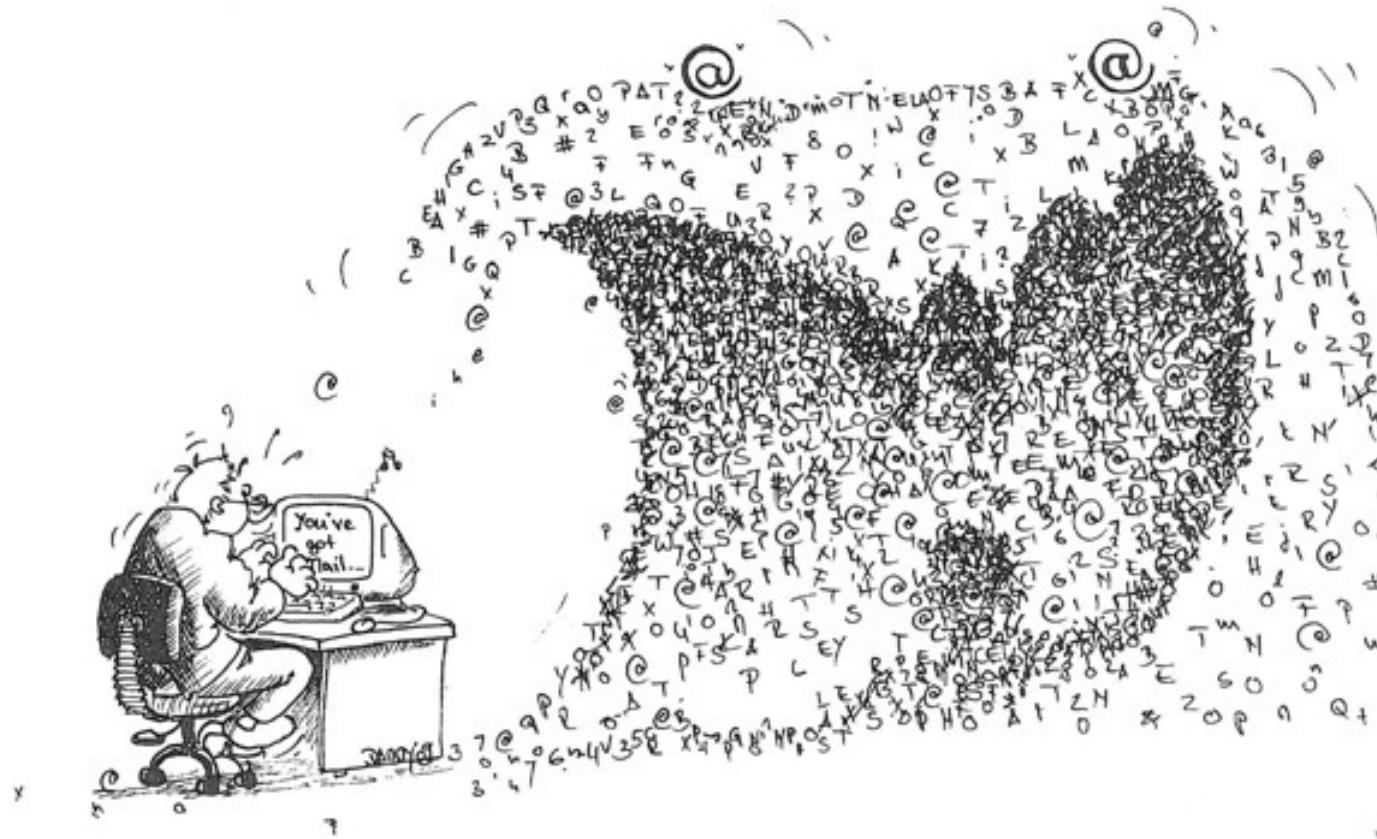
*A Data Scientist is...*



*A Business Analyst that lives in California.*

# Getting lost in your data

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# Getting lost in your data

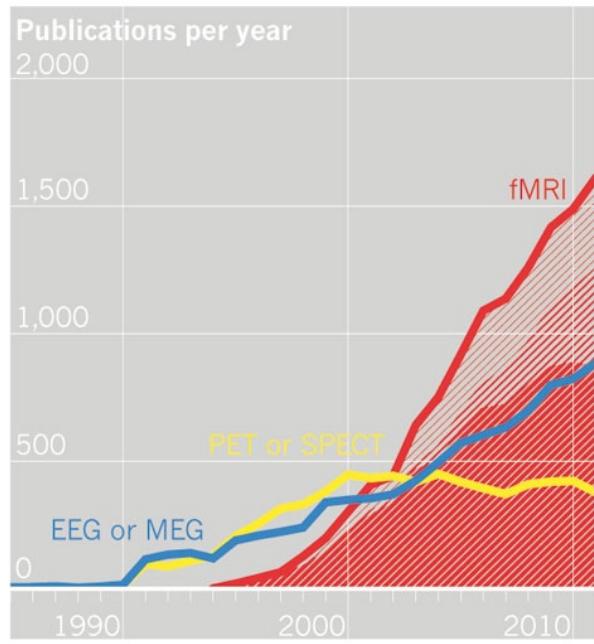
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Heterogeneity in data description practices causes:

- problems in sharing data,
- unnecessary manual metadata input,
- no way to automatically validate datasets.

# Getting lost in your data

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- MRI has been used to study the human brain for over 20 years.
- Despite similarities in experimental designs and data types each researcher tends to organize and describe their data in their own way.

<http://www.nature.com/news/brain-imaging-fmri-2-0-1.10365>

# Brain Imaging Data Structure

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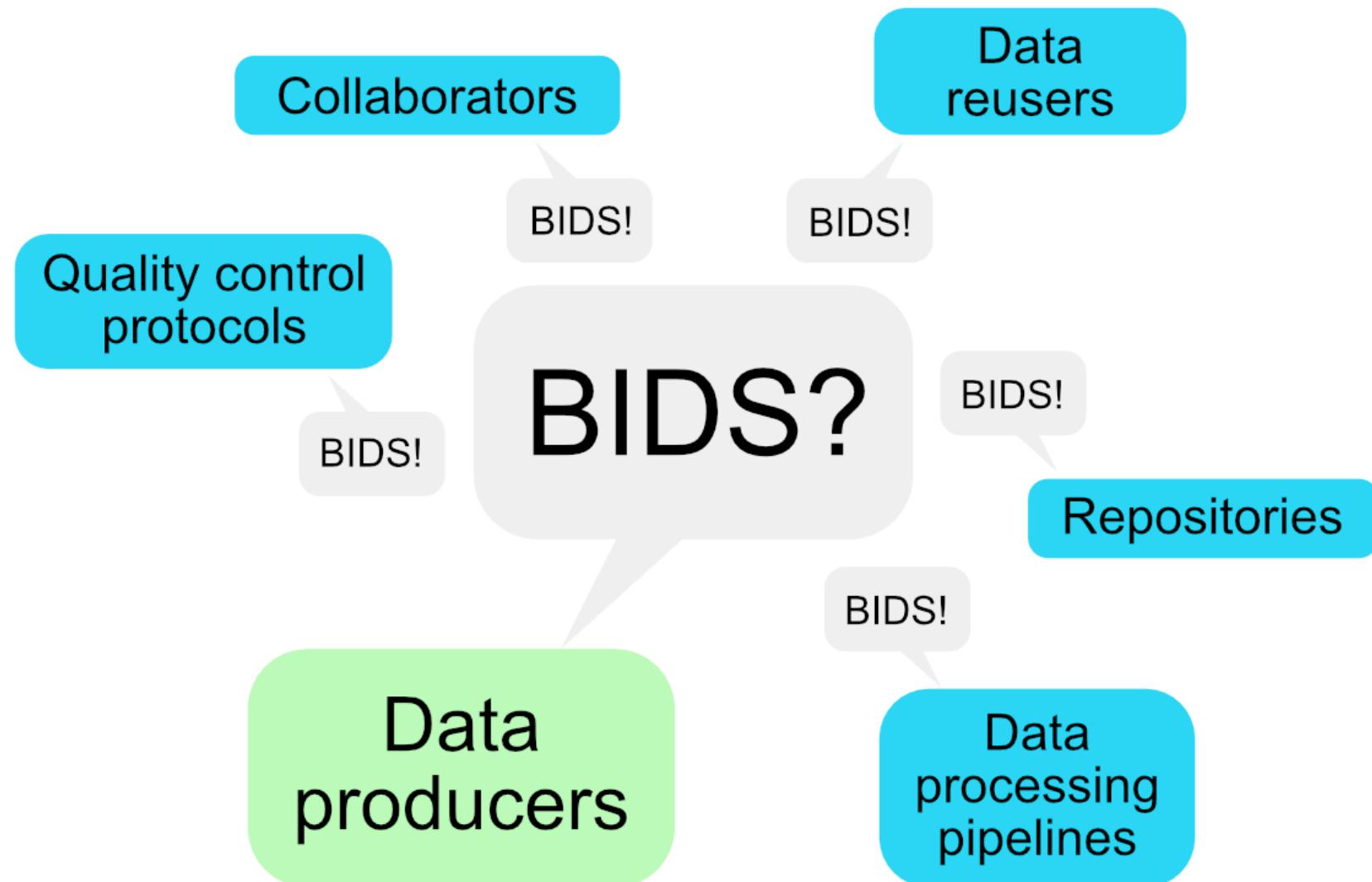
a new standard for organizing  
human neuroimaging datasets

# Who is it for?

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1. Lab PIs. It will make handing over one dataset from one student/postdoc to another easy.
2. Workflow developers. It's easier to write pipelines expecting a particular file organization.
3. Database curators. Accepting one dataset format will make curation easier.

# The language of data



# Principles behind BIDS

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1. Adoption is crucial.
2. Don't reinvent the wheel.
3. 80/20 rule.

# Folder organization

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dicomdir/

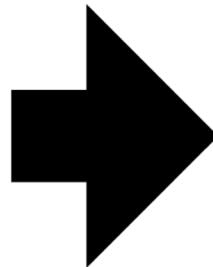
1208200617178\_22/

- 1208200617178\_22\_8973.dcm
- 1208200617178\_22\_8943.dcm
- 1208200617178\_22\_2973.dcm
- 1208200617178\_22\_8923.dcm
- 1208200617178\_22\_4473.dcm
- 1208200617178\_22\_8783.dcm
- 1208200617178\_22\_7328.dcm
- 1208200617178\_22\_9264.dcm
- 1208200617178\_22\_9967.dcm
- 1208200617178\_22\_3894.dcm
- 1208200617178\_22\_3899.dcm

1208200617178\_23/

1208200617178\_24/

1208200617178\_25/



my\_dataset/

participants.tsv

sub-01/

anat/

sub-01\_T1w.nii.gz

func/

sub-01\_task-rest\_bold.nii.gz

sub-01\_task-rest\_bold.json

dwi/

sub-01\_dwi.nii.gz

sub-01\_dwi.json

sub-01\_dwi.bval

sub-01\_dwi.bvec

sub-02/

sub-03/

sub-04/

# Folder organization

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```
my_dataset/
  participants.tsv
  sub-01/
    anat/
      sub-01_T1w.nii.gz
    func/
      sub-01_task-rest_bold.nii.gz
      sub-01_task-rest_bold.json
    dwi/
      sub-01_dwi.nii.gz
      sub-01_dwi.json
      sub-01_dwi.bval
      sub-01_dwi.bvec
  sub-02/
  sub-03/
  sub-04/
```

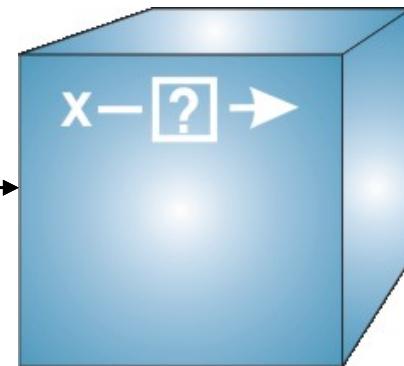
# Folder organization

```
my_dataset/
  participants.tsv
  sub-01/
    anat/
      sub-01_T1w.nii.gz
    func/
      sub-01_task-rest_bold.nii.gz
      sub-01_task-rest_bold.json
    dwi/
      sub-01_dwi.nii.gz
      sub-01_dwi.json
      sub-01_dwi.bval
      sub-01_dwi.bvec
  sub-02/
  sub-03/
  sub-04/
```

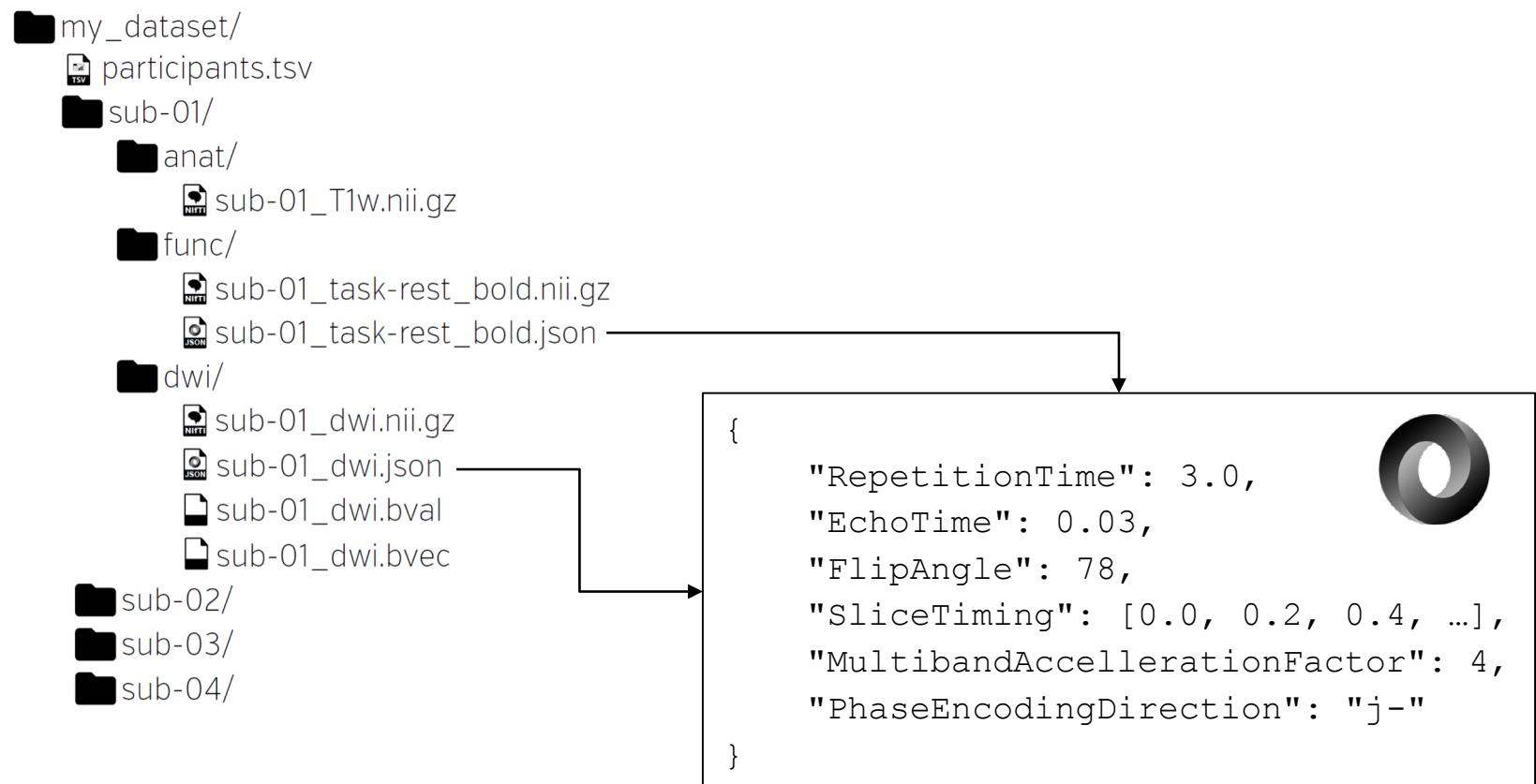
participant_id	age	sex
sub-001	34	M
sub-002	12	F
sub-003	33	F

# Folder organization

```
my_dataset/
  participants.tsv
  sub-01/
    anat/
      sub-01_T1w.nii.gz
    func/
      sub-01_task-rest_bold.nii.gz
      sub-01_task-rest_bold.json
    dwi/
      sub-01_dwi.nii.gz
      sub-01_dwi.json
      sub-01_dwi.bval
      sub-01_dwi.bvec
  sub-02/
  sub-03/
  sub-04/
```



# Folder organization



# The Validator

[incf.github.io/bids-validator](https://incf.github.io/bids-validator)

## Summary

- 40 Files, 18.42kB
- 13 - Subjects
- 1 - Session

## Available Tasks

- rhyme judgment

## Available Modalities

- bold
- T1w

Your dataset is not a valid BIDS dataset.

[view 1 error in 23 files](#)

[view 1 warning in 4 files](#)

# Prof. Smith (2030)

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# GETTING STARTED

Read the Starter Kit

[BIDS STARTER KIT](#)

Learn from examples

[FULL DATASETS IN OPENNEURO.ORG](#)

[STRIPPED DOWN DATASETS ON GITHUB.ORG](#)

Confused? Need help?

[POST A QUESTION ON NEUROSTARS.ORG](#)

# The Validator

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## Summary

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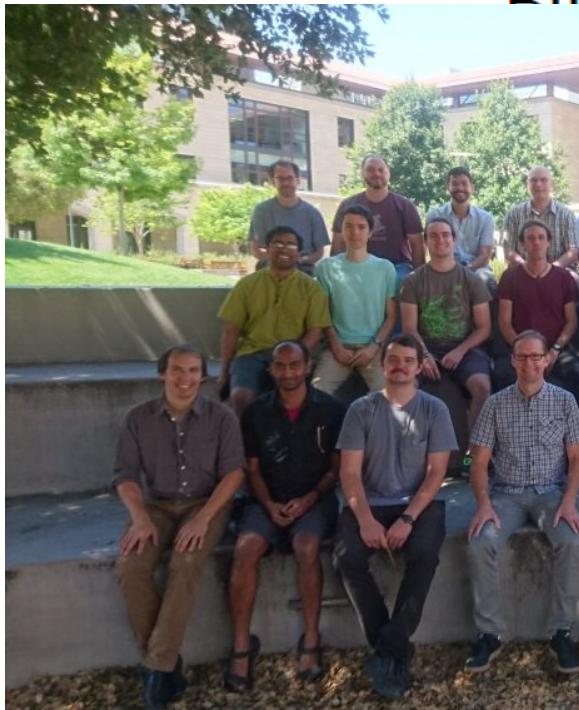
- bold
- T1w

Your dataset is not a valid BIDS dataset.

[view 1 error in 23 files](#)

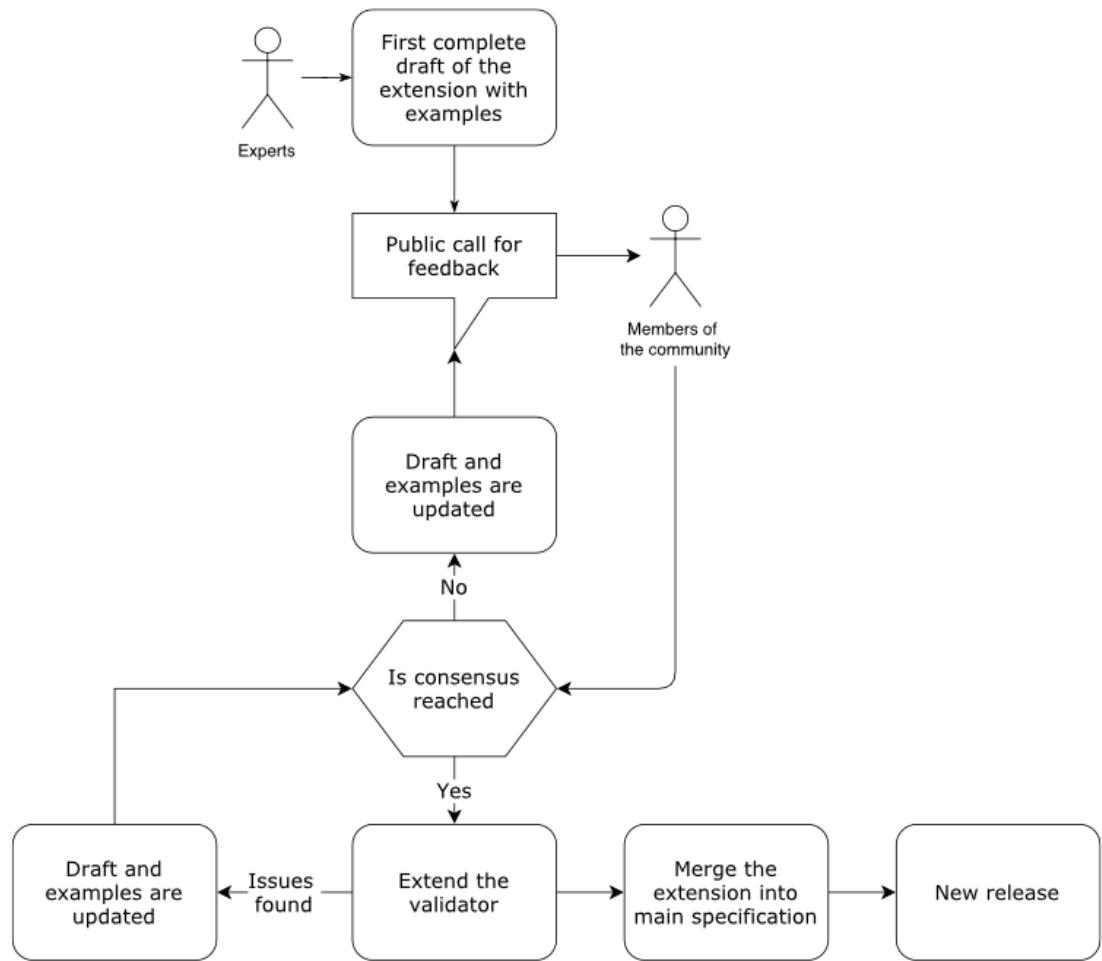
[view 1 warning in 4 files](#)

# BIDS Community



Vince D. Calhoun<sup>3,4</sup>, R. Cameron Craddock<sup>5,6</sup>, Samir Das<sup>7</sup>,  
Rajit S. Ghosh<sup>10,11</sup>, Tristan Glatard<sup>7,12</sup>, Yaroslav O. Halchenko<sup>13</sup>,  
<sup>5,16</sup>, David Keator<sup>17</sup>, Xiangrui Li<sup>18</sup>, Zachary Michael<sup>19</sup>,

Accepted: 19 May 2016 · Camille Maumet<sup>10</sup>, B. Nolan Nichols<sup>24,22</sup>, Thomas E. Nichols<sup>20,23</sup>, John Pellman<sup>6</sup>, Jean-Baptiste Poline<sup>24</sup>,  
Published: 21 June 2016 · Ariel Rokem<sup>25</sup>, Gunnar Schaefer<sup>1,26</sup>, Vanessa Sochat<sup>27</sup>, William Triplett<sup>1</sup>, Jessica A. Turner<sup>3,28</sup>,  
Gaël Varoquaux<sup>29</sup> & Russell A. Poldrack<sup>1</sup>



# You can contribute an extension too!

# Welcome to the BIDS Starter Kit

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How to get started with the Brain Imaging Data Structure

A community-curated collection of tutorials, wikis, and templates to get you started with creating BIDS compliant datasets.

[BIDS Homepage](#) | [Wiki](#) | [Standard](#) | [Tutorials](#) | [Chat](#) | [Forum](#)

Click to view the intro video!

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<https://github.com/INCF/bids-starter-kit>

# Adoption

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- ❑ Used in over 60 labs around the world
- ❑ Adopted by: FCP-INDI, Developing Human Connectome, SchizConnect and Donders Data repository.
- ❑ Part of the automatic data ingestion workflow for OpenNeuro.
- ❑ Anonymized data from over 20,000 participants formatted in BIDS are publicly available.

bids.neuroimaging.io

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(SPECIFICATION, EXAMPLES, DISCUSSION FORUM)