

PET data sharing and BIDS

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Rigshospitalet



Data sharing is not a choice anymore

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Data sharing in neuroimaging: experiences from the BIDS project

[Melanie Ganz](#)  & [Russell A. Poldrack](#)

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“Data sharing is moving from a choice that every researcher has to make to an expectation by funding agencies and governments, but also by the research community. At the same time, it requires community efforts to make data sharing easy and to ensure that what is shared can actually be re-used.”

And in PET we are on a good track!

- PET is much more than clinical scans with [^{18}F]FDG
- PET can visualize and quantitatively measure the function of biological and cellular processes in vivo

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Review Article

Consensus nomenclature for *in vivo* imaging of reversibly binding radioligands

Robert B Innis¹, Vincent J Cunningham², Jacques Delforge³, Masahiro Fujita¹, Albert Gjedde⁴, Roger N Gunn⁵, James Holden⁶, Sylvain Houle⁷, Sung-Cheng Huang⁸, Masanori Ichise⁹, Hidehiro Iida¹⁰, Hiroshi Ito¹¹, Yuichi Kimura¹², Robert A Koeppe¹³, Gitte M Knudsen¹⁴, Juhani Knuuti¹⁵, Adriaan A Lammertsma¹⁶, Marc Laruelle², Jean Logan¹⁷, Ralph Paul Maguire¹⁸, Mark A Mintun¹⁹, Evan D Morris²⁰, Ramin Parsey⁹, Julie C Price²¹, Mark Slifstein⁹, Vesna Sossi²², Tetsuya Suhara¹¹, John R Votaw²³, Dean F Wong²⁴ and Richard E Carson²⁵

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Consensus on publishing PET experiments

- Replication in science can be improved with standards for reporting and sharing of primary research data

Opinion

Guidelines for the content and format of PET brain data in publications and archives: A consensus paper

Gitte M Knudsen¹, Melanie Ganz¹, Stefan Appelhoff², Ronald Boellaard³, Guy Bormans⁴, Richard E Carson⁵, Ciprian Catana⁶, Doris Doudet⁷, Antony D Gee⁸ , Douglas N Greve⁶, Roger N Gunn⁹, Christer Halldin¹⁰, Peter Herscovitch¹¹, Henry Huang⁵, Sune H Keller¹², Adriaan A Lammertsma³, Rupert Lanzenberger¹³, Jieih-San Liow¹⁴, Talakad G Lohith¹⁵, Mark Lubberink¹⁶, Chul H Lyoo¹⁷, J John Mann¹⁸, Granville J Matheson¹⁰, Thomas E Nichols¹⁹ , Martin Nørgaard¹ , Todd Ogden²⁰, Ramin Parsey²¹, Victor W Pike¹⁴, Julie Price⁶, Gaia Rizzo⁹, Pedro Rosa-Neto^{22,23}, Martin Schain²⁰, Peter JH Scott²⁴, Graham Searle⁹, Mark Slifstein²¹, Tetsuya Suhara²⁵, Peter S Talbot²⁶, Adam Thomas²⁷, Mattia Veronese²⁸, Dean F Wong²⁹, Maqsood Yaqub³, Francesca Zanderigo³⁰, Sami Zoghbi¹⁴ and Robert B Innis¹⁴

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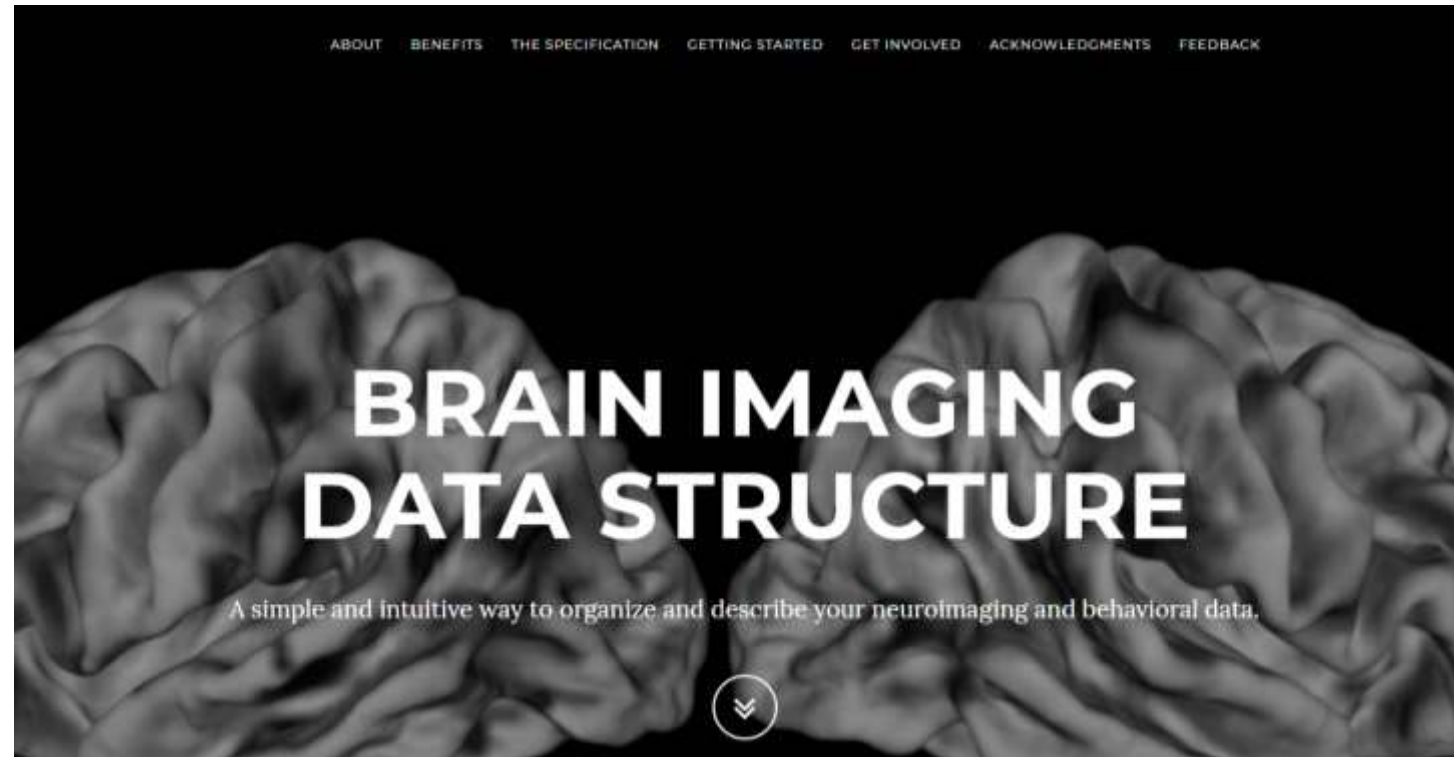
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 SAGE

Brain Imaging Data Structure (BIDS)

- It's a data structure ; nothing to do with format per se
- It's about:
 - how you organize data
 - how you name files
 - how you document metadata
 - uses community standards

bids.neuroimaging.io



PET-BIDS standard

- Community- derived
- Started in 2016/17
- Finalized in 2021
- Published in 2022


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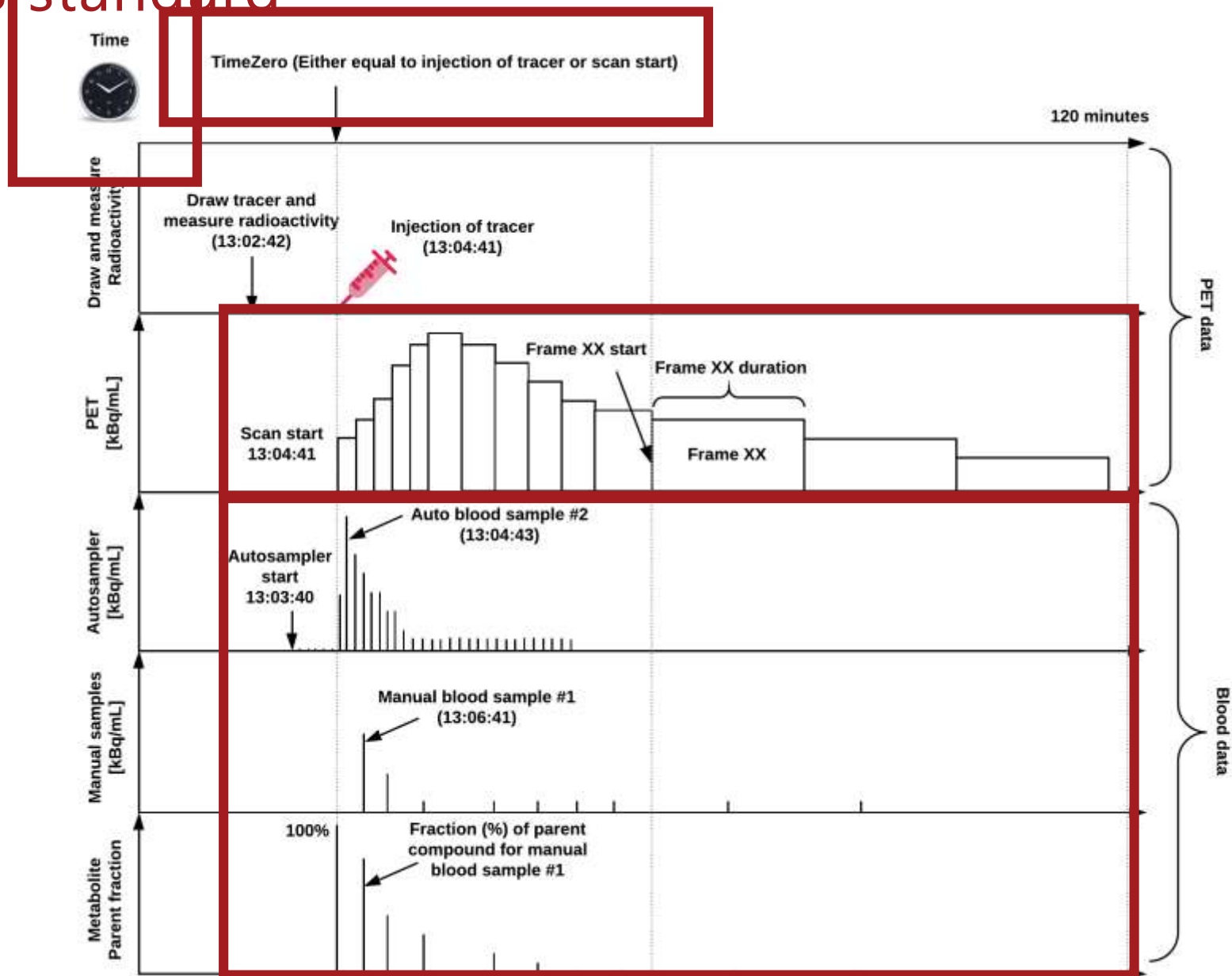
PET-BIDS, an extension to the brain imaging data structure for positron emission tomography

[Martin Norgaard](#), [Granville J. Matheson](#), [Hanne D. Hansen](#), [Adam Thomas](#), [Graham Searle](#), [Gaia Rizzo](#), [Mattia Veronese](#), [Alessio Giacomel](#), [Maqsood Yaqub](#), [Matteo Tonietto](#), [Thomas Funck](#), [Ashley Gillman](#), [Hugo Boniface](#), [Alexandre Routier](#), [Jelle R. Dalenberg](#), [Tobey Betthausen](#), [Franklin Feingold](#), [Christopher J. Markiewicz](#), [Krzysztof J. Gorgolewski](#), [Ross W. Blair](#), [Stefan Appelhoff](#), [Remi Gau](#), [Taylor Salo](#), [Guiomar Niso](#), ... [Melanie Ganz](#)  [+ Show authors](#)

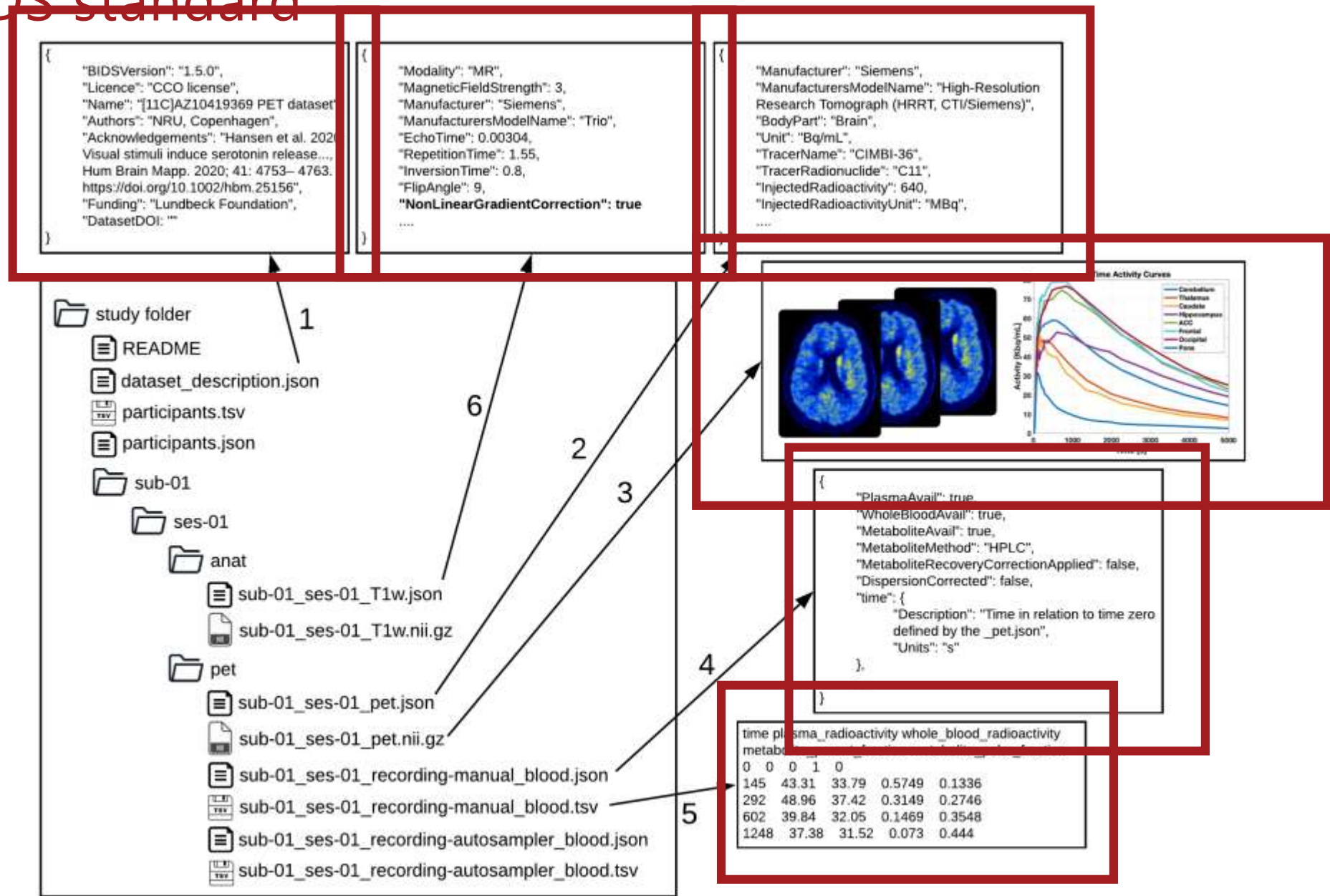
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PET-BIDS standard



PET-BIDS standard



From OpenNeuro ...

- Official repository for BRAIN Initiative
- Part of the Amazon Public Datasets project
- 945 public datasets
- 36,928 participants
- 10-20 new dataset uploads per month
- Serving 1000 + downloads/month (almost 20TB of data)
- Over 8K users/month



...to OpenNeuroPET

- Establish PET archive as an extension of OpenNeuro
 - Standard format and content
 - “Best Practices” for pipelines and QC checks
- Educate and seek feedback from the PET user community
- Establish average images of receptor density, connecting to larger fMRI community



openneuro.org

OpenNeuroPET status

The screenshot displays the OpenNeuro PET portal interface. At the top, the OpenNeuro logo is visible, along with navigation links for SEARCH, SUPPORT, and DOCUMENTATION, and a Sign in button. The main heading is "OpenNeuro PET". Below this, a paragraph describes the portal's support by a collaboration between Stanford University, NIH, MGH, and the Neurobiology Research Unit (NRU) at Copenhagen University Hospital, funded through the OpenNeuroPET project, the BRAIN Initiative, and the Novo Nordisk Foundation. It also mentions the development of data sharing tools and the goal of developing user-friendly tools for the BIDS-based data curation of PET data.

The main content area shows a list of datasets. The first dataset is "The energetic costs of the human connectome" by Valerie Carlsen, uploaded on 2023-02-25. It has 19 participants, 2 sessions, and 353 files. The second dataset is "A PET Molecular Imaging Brain Atlas of Cyclooxygenase-1 (Kim 2021)" by Paul Wightman, uploaded on 2023-01-12. It has 1 participant, 1 session, and 7 files. The third dataset is "First-in-human evaluation of [11C]PS13, a novel PET radioligand, to quantify cyclooxygenase-1 in the brain" by anthony galati, uploaded on 2022-08-01. It has 10 participants, 2 sessions, and 138 files. The fourth dataset is "Monash DaCRA fPET-fMRI" by Emma Liang, uploaded on 2020-11-24. It has 5 participants, 2 sessions, and 48 files.

On the right side, there are two detailed views of datasets. The first is "Monash vis-fPET-fMRI" by Shengyu Zhong, uploaded on 2020-11-16. It has 10 participants, 1 session, and 382 files. The second is "Monash rsPET-MR" by Thomas G. Choe, uploaded on 2020-06-17. It has 27 participants, 1 session, and 626 files. Both detailed views show the modalities (MRI, PET), tasks (fullchecker, halfchecker, rest, checkerboard, rest fPET and fMRI), and radiotracer (FDG).

At the bottom, there is a section for the "NRM2018 PET Grand Challenge Dataset" by Thomas Ruck, uploaded on 2019-01-23. It has 5 participants, 2 sessions, and 48 files. The modalities are PET and MRI, and the radiotracer is LondonPride.

Thank you!



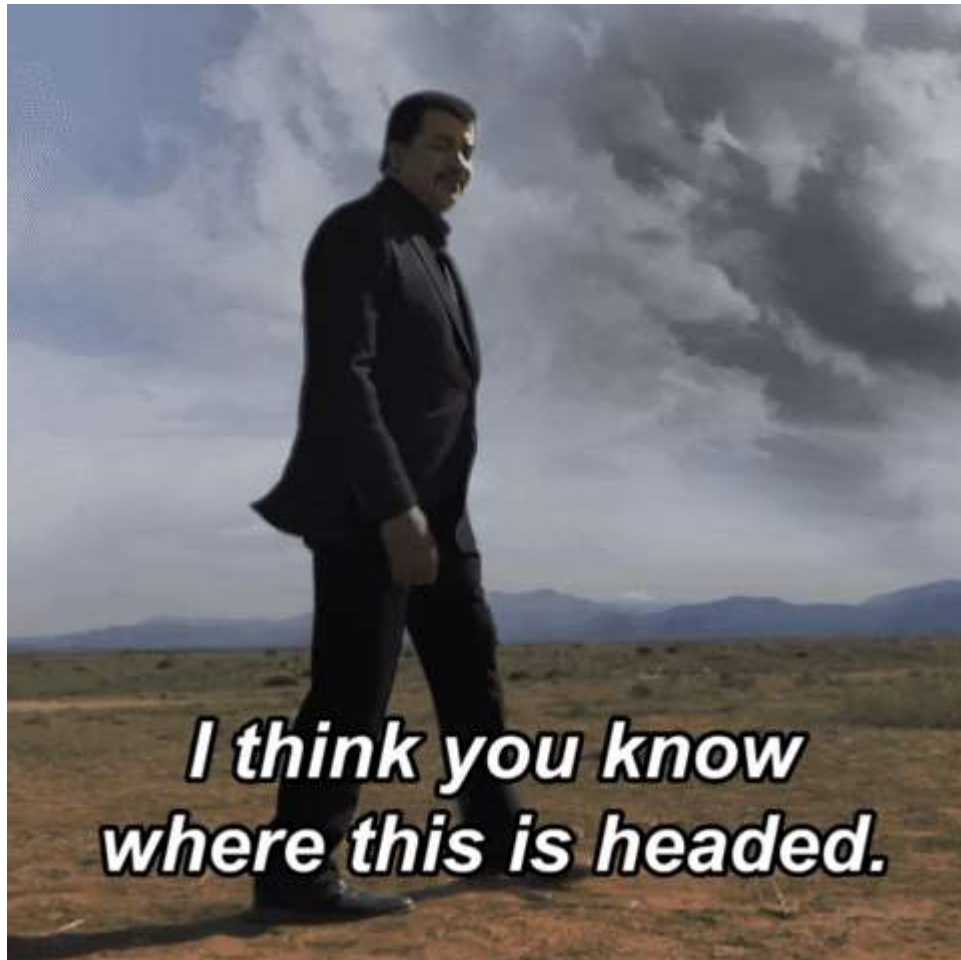
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<https://openneuropet.github.io/>
<https://public-neuro.github.io/>

We want you!



- Check out our mission statement on <https://openneuropet.github.io/>
- Take a peak at PET2BIDS on <https://github.com/openneuropet> to get help in converting your data
- Come and meet with us during our online office hours on November 14th and 16th between 8 and 18 UTC, book a slot via an e-mail to openneuropet@gmail.com

Thank you!



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