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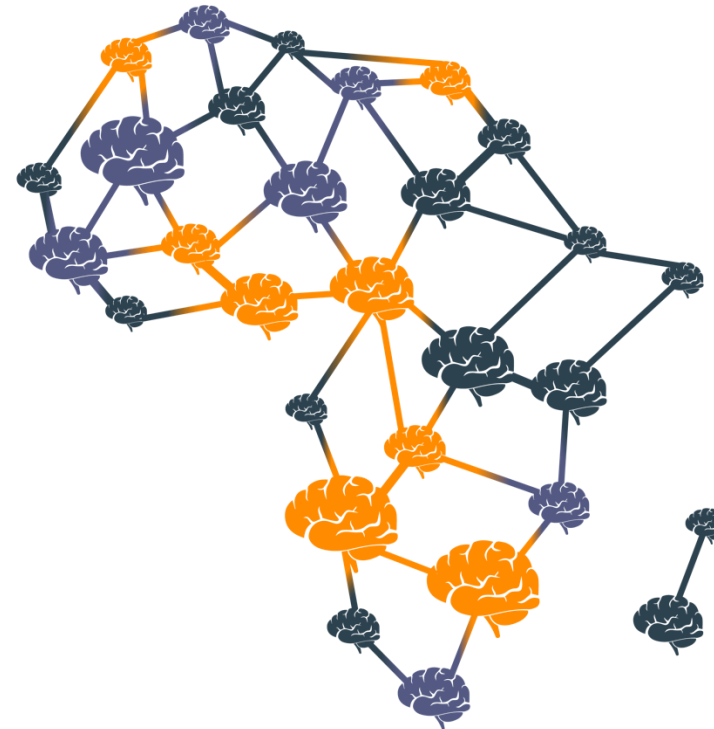
NatMEG



Where to get EEG data

Robert Oostenveld
Mikkel C. Vinding

9-14 June 2025
Port Harcourt, Nigeria



**African
Brain
Data
Network**

Outline and topics to cover

Own data, own experiment

Combine data over multiple labs

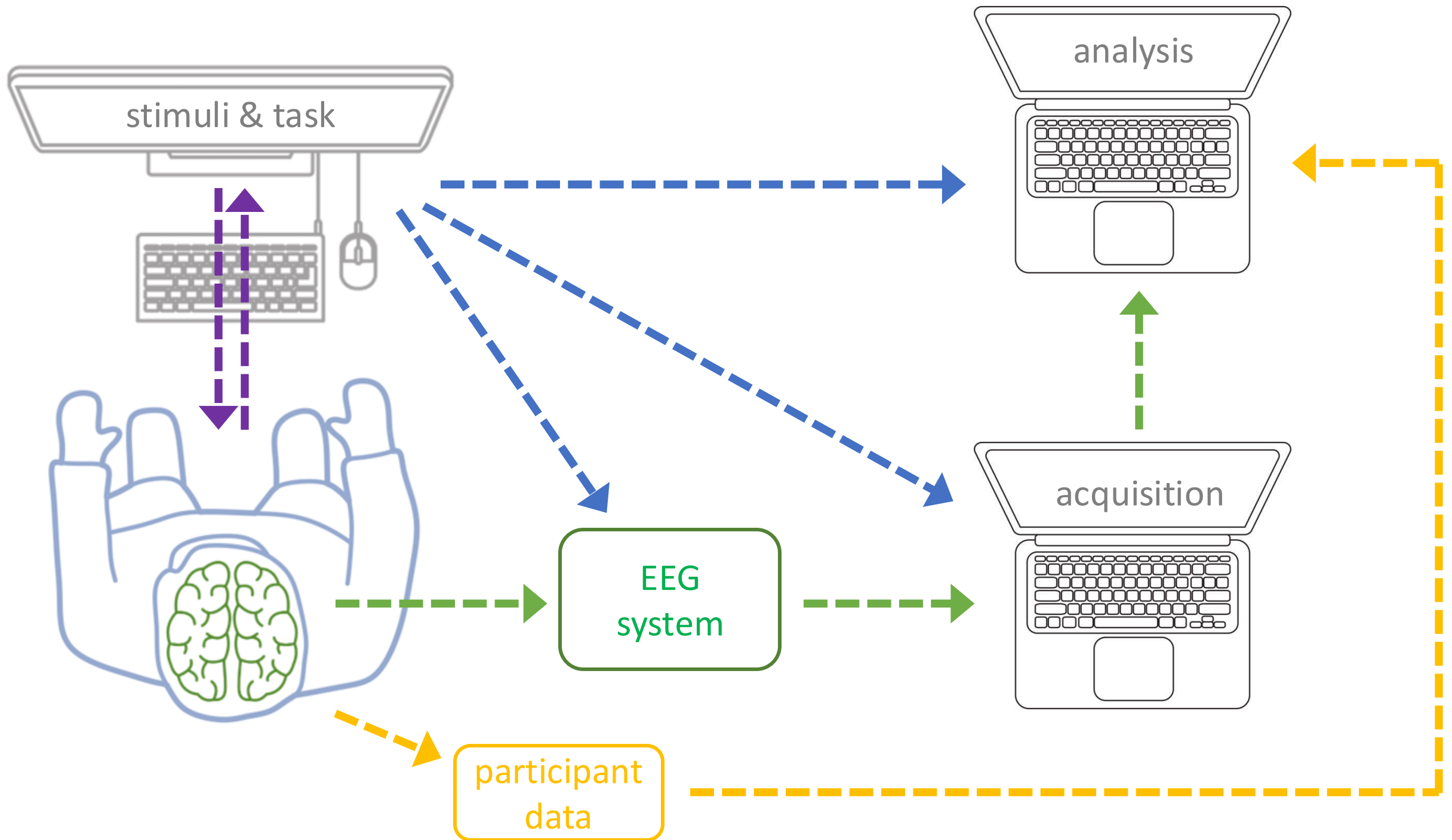
Use others' data

- Where to find it

- How is it formatted

- Brain Imaging Data Structure (BIDS)

- What to know about that data



Research using EEG in your own lab

You define the research question

You make the task and stimulus material

You select the participants

You do the experiment and record the data

You can analyze it yourself

However...

Setting up and/or maintaining an EEG lab is not very cheap

Getting participants and doing recordings is quite some work

You can also (re)use data that was recorded by others

Sometimes you want or need to collaborate

You contribute to the research question, the task and stimulus material

You find local participants

You record the data from local participants

Collaborators elsewhere also find participants and record them

You combine the data

You can analyze it yourself or together

In this case it is important that the data is sufficiently comparable between labs

Data transfer agreements need to be in place

Sometimes you just want to analyze

You define the research question -> to a limited extent

You make the task and stimulus material -> no

You select the participants -> no

You do the experiment and record the data -> no

You can analyze it yourself -> yes

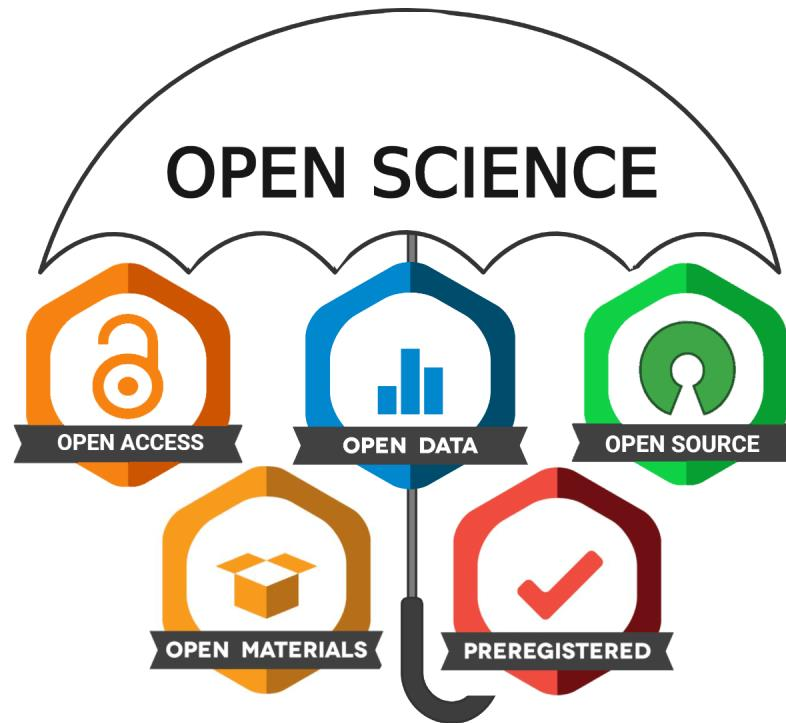


Why record data if you can use that by others?

Useful for generic data, like resting state, simple (old-fashioned) experiments.

Useful for teaching and training

Useful for trying out an analysis prior to **pre-registration**



Where to download EEG data



Generic repositories

Zenodo, OSF

From publishers, like DataDryad and FigShare

Institutional, like <https://data.ru.nl>

National, like <https://dataverse.nl> and <https://data.4tu.nl>

Domain-specific repositories

OpenNeuro

PublicnEUro

NEMAR (subset of OpenNeuro)

EBRAIN

Project-specific repositories

EEGNet

Physionet

Along with a publication or data descriptor paper

For example Scientific Data

Where to download EEG data



Generic repositories are **broad** and don't expose a lot of metadata about the specific EEG datasets

Project-specific repositories are **deep** and do expose a lot of metadata and search capabilities

Domain-specific repositories are in between

Where to search for EEG data



General search engines like google, etc.

Specific search engines

<https://datasetsearch.research.google.com>

<https://commons.datacite.org>

Specific search tools

<https://neurobagel.org>

<https://datalad.org>

What to look out for when downloading EEG data

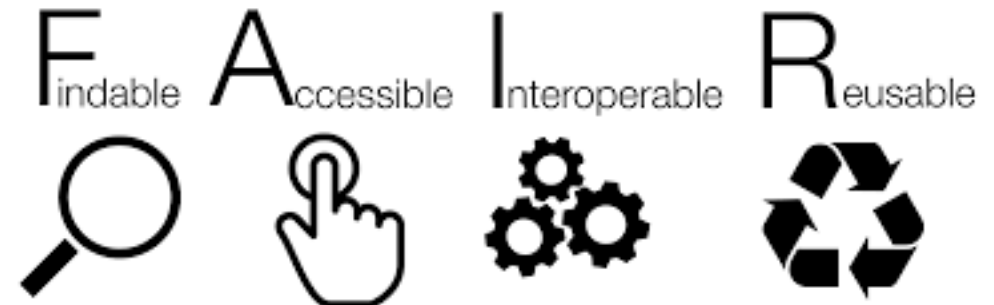


What is the task or experiment during which EEG was recorded?

What are the trigger codes or events?

What is the file format?

Open Data



Findable

Make your data available in a catalog or repository
with a persistent identifier (DOI, handle) and metadata

Accessible

Be explicit about data usage terms (agreement with downloader)

Interoperable

Make your data human and machine readable, e.g. BIDS

Reusable

Make sure you document enough details, e.g. “data descriptor” paper
that can be cited, along with citing our data -> measurable impact!

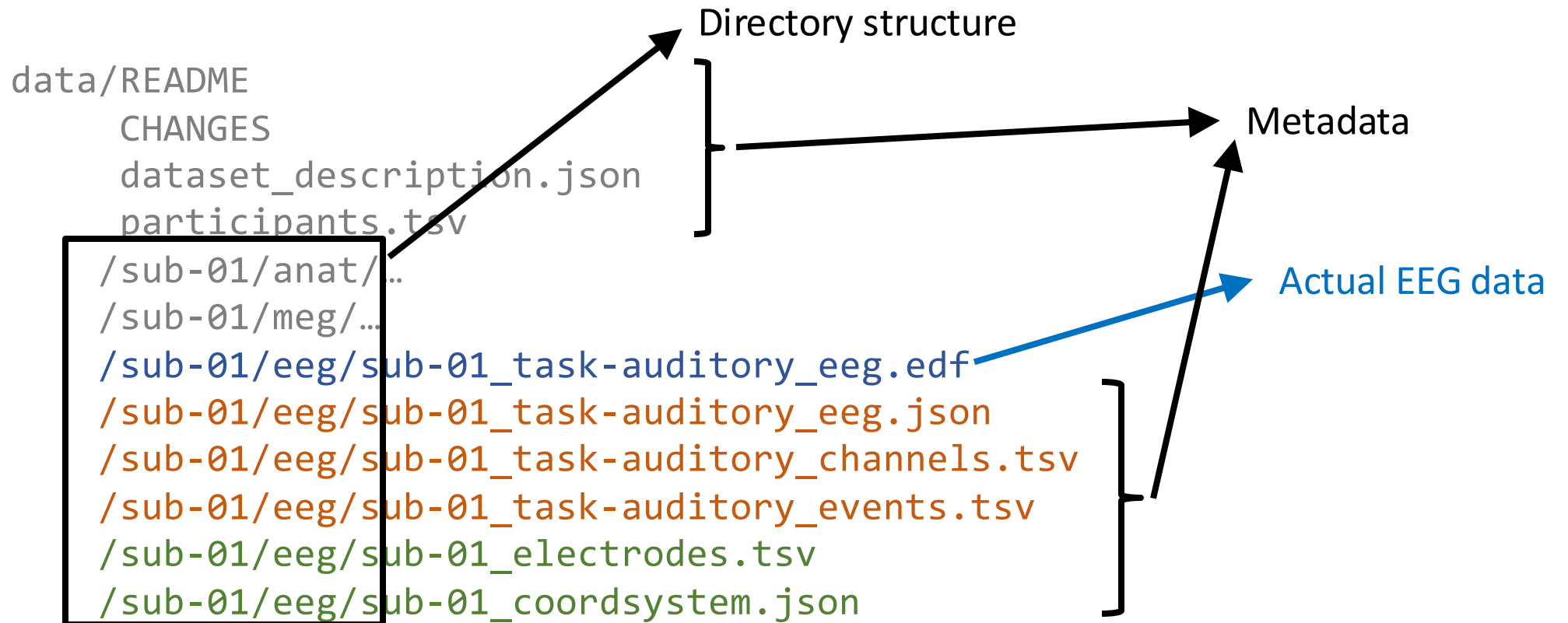
Making EEG data FAIR

The Brain Imaging Data Structure (BIDS) is a community initiative to make data more FAIR and to improve data sharing.

It especially improves the interoperability and reusability.



BIDS for EEG, MEG, MRI, etcetera.



BIDS “sidecar” files contain metadata

see also <https://github.com/bids-standard/bids-examples>



- 1) represent otherwise missing data
- 2) make it easier to query/search

As example for EEG:

_participants.tsv and json
_sessions.tsv and json
_scans.tsv and json

_eeg.json
_channels.tsv and json
_electrodes.tsv and json
_coordsystem.json

```
{  
  "TaskName": "matchingpennies",  
  "TaskDescription": "The task is emulating a game of 'matching pennies'",  
  "SamplingFrequency": 5000,  
  "Manufacturer": "Brain Products",  
  "ManufacturersModelName": "BrainAmp DC",  
  "CapManufacturer": "Brain Products",  
  "CapManufacturersModelName": "actiCAP 64Ch Standard-2",  
  "EEGChannelCount": 10,  
  "EOGChannelCount": 0,  
  "ECGChannelCount": 0,  
}
```

name	type	units	status	status_description
FC5	EEG	uV	bad	Contains high frequency noise
FC1	EEG	uV	good	n/a
C3	EEG	uV	good	n/a
CP5	EEG	uV	good	n/a
CP1	EEG	uV	good	n/a
FC2	EEG	uV	good	n/a
FC6	EEG	uV	bad	Low correlation with other channels
C4	EEG	uV	good	n/a
CP2	EEG	uV	good	n/a
CP6	EEG	uV	good	n/a

How are EEG dataset details documented

In the methods section of the paper that initially uses the data

In a data descriptor paper

In a README file (txt, docx, pdf) that comes along with the data

In the BIDS metadata / sidecar files



less detail

more detail

Let's try this out



Demonstration ...



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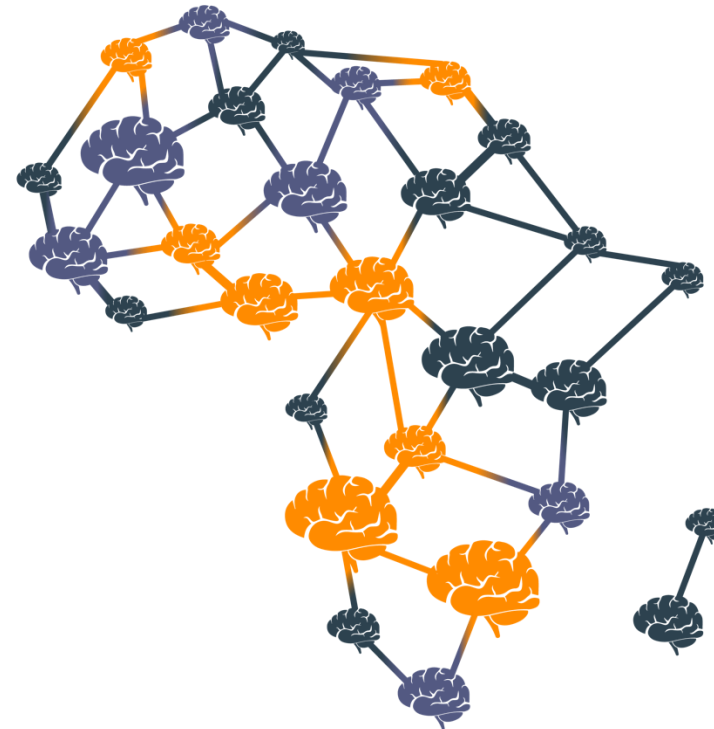
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