
Unraveling the neural mechanisms for action perception using intracranial recordings in the human brain

A Data Management Plan created using DMPonline.be

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Project abstract:

Social interactions in everyday life require accurately understanding actions and intentions of others. Notably, this ability is affected in individuals with neurological conditions such as autism. Previous work suggests that action understanding relies on a network of brain areas consistently reported to be active when observing actions. In humans, this action-observation network spans large portions of cortex, including the parietal, frontal and temporal lobes. What are the neuronal processes that support action understanding? A dominant hypothesis proposes that we understand actions by mapping the visual representation of the observed action onto our motor representation of the same action. Studies in humans using non-invasive methods such as functional neuroimaging have mapped the nodes implicated in the action-observation network. However, these methods are limited in the information they can provide. Hence the underlying neural mechanisms and temporal dynamics for action perception still need to be determined. I will conduct intracranial recordings in the human brain to investigate the processing steps involved in action perception at an unprecedented level of spatial and temporal accuracy. In addition, I will study the temporal dynamics of functional connectivity across cortical areas. Importantly, I will compare the neural mechanisms supporting action execution vs. observation to identify the common substrate that encodes abstract representations of actions.

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DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

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GDPR

GDPR

Have you registered personal data processing activities for this project?

- Not applicable

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Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects ...) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

In this project, I will generate new data. These data consist of neurophysiological recordings in the human brain using intracranial electrodes. Data will be stored in Matlab format files (.mat) and the expected size is >100GB. These files will contain 2D matrices (channels x time) with uV values. No personal data will be collected.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

1. Designation of responsible person (If already designated, please fill in his/her name.)
I (Marcelo Armendariz) will be responsible for storing the data.
2. Storage capacity/repository
 - During data collection, the data will be temporarily stored on my laptop and external disks. Then, these data will soon be stored on the university's central servers with automatic backup procedures. No personal/private data will be stored. In any case, data will be stored in the university's secure services.
 - After the research, the data will be stored on the university's servers for more than ten years, which is common in our group. Our lab has held ample storage space (>>TB) at university servers for over a decade. The data size is relatively small compared to servers capacity, implying a low cost, which the lab can easily assume.

What's the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

No reason.

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

No. No personal data will be collected. Collected data will be stored in Matlab format files (.mat) in the shape of 2D matrices (channels x time) with uV values (integers). Each file will be identified with a random ID containing letters and numbers, thus ensuring no association can be done with any participant.

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

No issues

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FWO DMP (Flemish Standard DMP)

1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
		<div>Please choose from the following options:<ul style="list-style-type: none">Generate new dataReuse existing data</div>	<div>Please choose from the following options:<ul style="list-style-type: none">DigitalPhysical</div>	<div>Please choose from the following options:<ul style="list-style-type: none">ObservationalExperimentalCompiled/aggregated dataSimulation dataSoftwareOtherNA</div>	<div>Please choose from the following options:<ul style="list-style-type: none">.por, .xml, .tab, .csv, .pdf, .txt, .rtf, .dwg, .gml, ...NA</div>	<div>Please choose from the following options:<ul style="list-style-type: none"><100MB<1GB<100GB<1TB<5TB<10TB<50TB>50TBNA</div>	
EphysData	Electrophysiological recordings	New	Digital	Experimental	.mat	<TB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

N/A

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- No

No issues.

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Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- No

No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, ...)? If so, please comment per dataset or data type where appropriate.

- No

No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

After publication, all the code used to read/use/process the data will be released. This will allow anyone to easily reproduce the findings of my research. The code will contain comments to interpret variables and functions. Example figures illustrating the data will be included to understand the outputs. Published manuscripts will also contain the information required to interpret the data.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- No

Required metadata will be included in the .mat files.

3. Data storage & back-up during the research project

Where will the data be stored?

The data will be stored on the university's central servers with automatic backup procedures.

How will the data be backed up?

Yes, the university's central servers have automatic backup procedures.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.

If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

There are enough resources at the university (>>TB)

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

Data will be stored on the university's secure services, to which only authorized people have access.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

If additional storage is needed, I will purchase it using my bench fee.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

All data will be preserved on the university servers.

Where will these data be archived (stored and curated for the long-term)?

Data will be preserved on the university servers.

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

Our lab has held ample storage space (>>TB) at university servers for over a decade. The data size is relatively small compared to servers capacity, implying a low cost, which the lab can easily assume.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Yes, in an Open Access repository
- Yes, in a restricted access repository (after approval, institutional access only, ...)

Yes by either using repositories or by request.

If access is restricted, please specify who will be able to access the data and under what conditions.

Researchers will be able to access the data for scientific purposes

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- No

Where will the data be made available? If already known, please provide a repository per dataset or data type.

For example in DANDI archive
<https://dandiarchive.org>

When will the data be made available?

After publication

Which data usage licenses are you going to provide? If none, please explain why.

Licenses will allow reusing data for research purposes.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- Yes

Not yet available.

What are the expected costs for data sharing? How will these costs be covered?

Since the size of the data is reasonably manageable, it can be easily shared with minor costs that can be assumed by the lab.

6. Responsibilities

Who will manage data documentation and metadata during the research project?

Myself

Who will manage data storage and backup during the research project?

Myself

Who will manage data preservation and sharing?

Myself

Who will update and implement this DMP?

Myself