Multifaceted approach to investigate position sense in health and disease

A Data Management Plan created using DMPonline.be

Creator: Jean-Jacques Orban de Xivry https://orcid.org/0000-0002-4603-7939

Affiliation: KU Leuven (KUL)

Funder: Fonds voor Wetenschappelijk Onderzoek - Research Foundation Flanders (FWO)

Template: FWO DMP (Flemish Standard DMP)

Grant number / URL: G001724N

ID: 208310

Start date: 01-01-2024

End date: 31-12-2028

Project abstract:

Position sense, which is the ability to locate the position of one’s limb in space in the absence of visual input, allows us to interact with the external world efficiently. When cooking, one could grab a pasta box on her/his non-dominant side, pass it to her/his dominant one without looking at the pasta box at all. These kinds of actions go unnoticed by healthy people but are problematic when the position sense is deficient such as in cancer patients suffering from chemotherapy-induced peripheral neuropathy (CIPN). Dropping objects unexpectedly is one sign of position sense deficits in these patients. Given its central role in motor function, impairment of the position sense has a direct impact on the quality of life and wellbeing of people. Despite the awareness on the importance of position sense in health and disease, there remains a number of challenges to answer before being able to obtain a good theoretical framework on joint position sense. The absence of such framework prevents one from helping people suffering from position sense deficits such as older adults and cancer patients. The goal of this project is to take up these challenges by using a task battery of sensory, motor and cognitive tasks in order to provide the foundations for a new theoretical framework of position sense and to apply it to age- and disease-related changes in position sense.

Last modified: 18-06-2024

Multifaceted approach to investigate position sense in health and disease
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)

Type of data
Format
Volum
How created
Experimental data based on standardized questionnaires for participant screening and testing.
REDCAP, electronic format
1 MB per participant
Face-to-face interviews
Experimental data linked to upper limb movement behavior as collected by the Kinarm device
c3d/matlab
100MB per participant

Experimental data collected during posture task by a portable force plate (BTracks Inc.)
excel/matlab
20MB per participant

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)

Question not answered.

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)

Question not answered.

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)

Question not answered.

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

Question not answered.

Multifaceted approach to investigate position sense in health and disease
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.

Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)
Screening Forms	Experimental data based on standardized questionnaires for participant screening and testing including medical history, demographics	new data	digital	Observational	online in REDCAP database	<100MB
Upper limb data	Experimental data linked to upper limb movement behavior as collected by the Kinarm device	new data	digital	observational	c3d/matlab	<100GB
Balance data	Experimental data collected during posture task by a portable force plate (BTracks Inc.)	new data	digital	observational	excel/matlab	<100GB
Video data	Movie from upper and lower limbs during proprioceptive tasks	new data	digital	observational	video fromat	<1TB

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:

NA

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.

- Yes, human subject data

we will obtain ethical approval from the medical ethics committee of the UZ Leuven for the patient study and from SMEC for the aging study.

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.

- Yes

We will collect personal data:

- Age, gender, educational level, email address, date of birth
- Video of their upper and lower limbs (without the face and without sound)
- For the patients, medical history linked to their chemotherapy.

This data will be hosted on the REDCAP database

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

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

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

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).

Experimental data based on standardized questionnaires for participant screening and testing and medical history will be hosted on REDCAP together with the questions that were asked. Original questionnaires will be stored electronically
Experimental data linked to upper limb movement behavior as collected by the Kinarm device. Videos of the task will be kept together with the source codes used to run the tasks on the robot. Analysis code will include all the information necessary to understand the outcome parameters.
Experimental data collected during posture task by a portable force plate (BTracks Inc.)
Detailed metadata will be obtained and stored with 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

Together with the data, we will keep the following information:

- the context of data collection: project aim, objectives and hypotheses based on the research proposal funded by the FWO.
- description of the different type of data collected.
- Organisation of the map structure, which will be inspired by BIDS standard (https://bids.neuroimaging.io/)
- difference between raw and processed files and how the transition between the two can be achieved.
- a Notebook where comments about the data acquisition for each participant will be detailed.
- names, labels and descriptions for variables, records and their values will be documented either in a dedicated readme file or in the analysis code that is used to compute the important variables.
- derived data created after collection, with code to reproduce these derived data.

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 daily back-up procedures.

How will the data be backed up?

The data will be stored on the university's central servers with automatic daily back-up 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

we do not expect to exceed storage capacity

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

The data will be on the L-drive of the KU Leuven, which can only be accessed with a KU Leuven login and password.

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

There is a fee to be paid (1000€ per year), which is covered by our department.

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 the electronic data will be retained for 10 years following the KU Leuven data management policy. All forms are stored electronically from the beginning of the project.

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

1. The data will be stored on the university's central servers (with automatic back-up procedures) for at least 10 years, conform the KU Leuven RDM policy.
2. Anonymized raw and processed behavioral data will be shared on the Open Science Framework to be available for the scientific community for the long-term.

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

The database will be hosted on the servers of the KU Leuven (large volume storage) for an estimated cost of 1000€ per year (8TB), currently covered by our department.

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

Participants will have to agree to share the anonymized data when they signed the informed consent. Our current experience is that all participants abide to do so. This will need to be approved by the ethical committee of UZ Leuven.
The full dataset linked to behavioral performance will be uploaded on the Open Science Framework under a CC-BY license.

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

Question not answered.

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

Participants will have to agree to share the anonymized data when they signed the informed consent. Our current experience is that all participants abide to do so. This will need to be approved by the ethical committee of UZ Leuven.

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

1. The full dataset linked to behavioral data with documentation will be uploaded on Open Science Framework or the RDR repository of the KU Leuven
2. The source code to process the data and reproduced the analysis will be released as well.

When will the data be made available?

Upon publication of the research results

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

CC BY-NC-SA 4.0
This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, for noncommercial purposes only. If others modify or adapt the material, they must license the modified material under identical terms.
BY: Credit must be given to you, the creator. NC: Only noncommercial use of your work is permitted. Noncommercial means not primarily intended for or directed towards commercial advantage or monetary compensation. SA: Adaptations must be shared under the same terms.

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

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

Open Science Framework and RDR are currently free.

6. Responsibilities

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

The PhD students recruited for this project (Danny Koumans and Ilaria Carrara) will be responsible for data documentation and metadata together with the PI of the project (JJ Orban de Xivry)

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

The PhD students recruited for this project (Danny Koumans and Ilaria Carrara) will be responsible for data storage and back-up together with the PI of the project (JJ Orban de Xivry)

Who will manage data preservation and sharing?

JJ Orban de Xivry is responsible for data preservation and reuse

Who will update and implement this DMP?

The PI (JJ Orban de Xivry) and the two PhD students (Ilaria Carrara and Danny Koumans) bear the end responsibility of updating & implementing this DMP.