DMP title

Project Name A Framework for Real-Time Difficulty Adaptation of Interactive Systems for Rehabilitation - DMP title

Project Identifier 11E9122N

Principal Investigator / Researcher Maria Aufheimer

Description Rehabilitation and training (e.g., wheelchair training for people with limited mobility) are an important step towards independent mobility and better quality of life. However, rehabilitation often requires engagement with lengthy and monotonous exercise routines, and interactive systems are a promising avenue to avoid patient drop-out. However, existing systems fall short of traditional approaches in terms of difficulty adjustment and scaffolding typically provided by the therapist. This project will contribute novel algorithms for real-time difficulty adaptation in interactive systems and games for rehabilitation using wheelchair training as an example, building on research on dynamic difficulty adjustment in games and connecting it with the requirements of clinical settings. Throughout, the project will complement theoretical considerations with empirical work, involving rehabilitation experts and patients as expert stakeholders as well as participants during the validation phase. Further, the project seeks to develop a framework that provides empirically grounded recommendations for the design and development of adaptive interactive rehabilitative systems, thereby laying the theoretical foundation for further research into technology-based rehabilitation.

Institution KU Leuven

1. General Information

Name applicant

Maria Aufheimer

FWO Project Number & Title

11E9122N – A Framework for Real-Time Difficulty Adaptation of Interactive Systems for Rehabilitation

Affiliation

- KU Leuven

2. Data description

Will you generate/collect new data and/or make use of existing data?

- Generate new data

Describe in detail the origin, type and format of the data (per dataset) and its (estimated) volume. This may be easiest in a table (see example) or as a data flow and per WP or objective of the project. If you reuse existing data, specify the source of these data. Distinguish data types (the kind of content) from data formats (the technical format).

Ref.Nr.	Type of data	Format	Volume	How created
1	qualitative data: 12 interviews (motivation and scaffolding in therapy)	.mkv or .wav	1GB	recordings of online interview sessions with therapists
2	transcripts of interviews in #1	.docx and .pdf	10MB	-
3	qualitative data: 12 interviews (algorithm design)	.mkv or .wav	500MB	recordings of online interviews with stakeholders, game developers, and rehabilitation experts
4	transcripts of interviews in #3	.docx and .pdf	5MB	-
5	qualitative data: 12 interviews (system design)	.mkv or .wav	1GB	recordings of online interviews and design sessions with stakeholders, game developers, and rehabilitation experts
6	transcripts of recordings in #5	.docx and .pdf	10MB	-
7	qualitative data: 12 interviews/test sessions (testbed application input review)	.mkv and .wav	1GB	audio and screen-recordings of face-to-face sessions to review a developed testbed application
8	transcripts/notes of test sessions in #7	.docx and .pdf	10MB	-
9	qualitative data: 12 interviews/test sessions (system review)	.mkv and .wav	1GB	audio and screen-recordings of face-to-face sessions to review a developed system
10	transcripts/notes of test sessions in #9	.docx and .pdf	10MB	-
11	quantitative survey data: 50 participants (end-user evaluation)	.xls and/or .csv	15MB	data entered into a digital survey system during the end-user evaluation sessions
12	qualitative data: 50 participants (end-user evaluation)	.mkv and .wav	3GB	audio and screen-recordings of end-user evalutation sessions
13	transcripts/notes of evaluation session in #12	.docx and .pdf	15MB	-

3. Legal and ethical issues

Will you use personal data? If so, shortly describe the kind of personal data you will use. Add the reference to your file in KU Leuven's Register of Data Processing for Research and Public Service Purposes (PRET application). Be aware that registering the fact that you process personal data is a legal obligation.

- Yes

Privacy Registry Reference: G-2021-3290-R3(AMD)

Short description of the kind of personal data that will be used:

We have collected data on participant’s work practice, more specifically their approach to physical therapy sessions, strategies that are applied, what specific kind of therapy they usually conduct, what disabilities they work with and opinions towards utilising games for therapy. Potential identifying data on participants' patients possibly mentioned during the interview will be anonymized during transcription of the interviews (see also Section 6, "Technical and organisational measures for data processing and data management"). Aside from the recording of the interview, we will not collect data that allows us to identify individuals.

We did not yet apply for ethics for future data collections, however, the studies we have still planned will be conducted in a very similar manner, i.e., we will collect data on participants professional backgrounds and their feedback on our prototypes and systems, and anonymise the data.

Before data collection will commence, we will apply for ethical approval.

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, add the reference to the formal approval by the relevant ethical review committee(s)

- Yes

reference to ethical committee approval (PRET application): G-2021-3290-R3(AMD)

Does your work possibly result in research data with potential for tech transfer and valorisation? Will IP restrictions be claimed for the data you created? If so, for what data and which restrictions will be asserted?

- Yes

All data collected will be used to develop a gaming system that may be valorised and for which IP may be claimed. However, the data itself will not directly lend itself to valorization.

Do existing 3rd party agreements restrict dissemination or exploitation of the data you (re)use? If so, to what data do they relate and what restrictions are in place?

- No

4. Documentation and metadata

What documentation will be provided to enable reuse of the data collected/generated in this project?

Collected data will not be reused, since participants do not consent to their data being used outside the scope of this project. However, the signed informed consent forms will be stored and we will generate metadate in the process of analysis. In the case of interviews for example, this could include codebooks for analysis. Any identifying information will be removed from the data before storage.

Will a metadata standard be used? If so, describe in detail which standard will be used. If no, state in detail which metadata will be created to make the data easy/easier to find and reuse.

- No

5. Data storage and backup during the FWO project

Where will the data be stored?

Master copies of all collected data will be stored on a password protected KU Leuven J-Drive or OneDrive from where copies can be made and kept on personal devices for analysis.

How is backup of the data provided?

The data will be stored on a password protected KU Leuven J-Drive and OneDrive with their respective automatic 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

The storage and backup capacity offered by OneDrive and J-Drive are sufficient for this project.

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

There are currently no costs expected for data storage and backup.

Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

The data will be stored on the university's secure servers and any identifying information (accidentally) collected will be anoymised as soon as possible.

6. Data preservation after the FWO project

Which data will be retained for the expected 5 year period after the end of the project? In case only a selection of the data can/will be preserved, clearly state the reasons for this (legal or contractual restrictions, physical preservation issues, ...).

All data will be retained, except for data that is transcribed, i.e., (audio) recordings of interviews. Here, only the fully anonymised transcripts will be retained.

Where will the data be archived (= stored for the longer term)?

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.

What are the expected costs for data preservation during the retention period of 5 years? How will the costs be covered?

We currently do not expect any cost for data retention, since we only generate a small amount of data. After the end of the degree/project, Kathrin Gerling (PhD adviser) will be in charge of dealing with storage through their personal KU Leuven drive.

7. Data sharing and reuse

Are there any factors restricting or preventing the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

- Yes. Specify:

Data can not be shared beyond researchers associated with the project, since participants do not give consent to do so.

Which data will be made available after the end of the project?

No data will be made available after the end of the project, since participants do not consent to their data being used outside the purposes of this project.

Where/how will the data be made available for reuse?

- Other (specify):

Data will not be made available for reuse, since participants do not consent to their data being used outside the purposes of this project.

When will the data be made available?

-

Who will be able to access the data and under what conditions?

-

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

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8. Responsibilities

Who will be responsible for data documentation & metadata?

Maria Aufheimer (PhD student) will be responsible for data documentation and metadata.

Who will be responsible for data storage & back up during the project?

Maria Aufheimer and Kathrin Gerling (PhD student and PhD advisor) will be responsible for data storage and back up during the project.

Who will be responsible for ensuring data preservation and reuse ?

Kathrin Gerling (PhD advisor) will be responsible for data preservation, however, data will not be reused as mentioned in the respective section before.

Who bears the end responsibility for updating & implementing this DMP?

Maria Aufheimer and Kathrin Gerling (PhD student and PhD advisor) bear the end responsibility of updating & implementing this DMP.