HELIXON

A Data Management Plan created using DMPonline.be

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Project abstract:

A key auditory element in extended reality (XR) applications is the auralization of virtual sources in real environments for dynamic observers. Firstly, commercially available
technology currently does not provide a solution to this problem, while present-day research is at a level that does not yet offer the versatility and algorithmic efficiency needed in real-life, real-time applications. Secondly, due to this lack of existing solutions, the road to adoption of XR technology by end users is still a long way ahead. The HELIXON project builds upon the ERC Consolidator Grant 'The Spatial Dynamics of Room Acoustics (SONORA)' and aims to develop and showcase a novel approach to integrate an acoustic model of a real environment into a dynamic auralization setup. The novel approach is envisaged to be significantly faster, more flexible regarding the environment geometry, and less hardware- dependent than existing dynamic auralization methods and thus suitable for real-life, real-time consumer applications. This is achieved by adopting an acoustic model for the environment developed in the SONORA project, which is based on the concept of equivalent sources and integrates remarkably well
with existing approaches to anechoic auralization. The proof of concept will be conceived as an XR sound art installation which hence not only serves to demonstrate the feasibility of the
approach but also provides a framework for end users to experience and reflect on how XR impacts their lives and their views on culture and society. In this way, the project is anticipated to have an economic as well as a societal innovation potential. A two-fold pathway from research to innovation is proposed: a Research & Development Pathway in which the remaining technical challenges will be addressed and the proof of concept will be developed and implemented, and an Exploitation Pathway in which the IPR strategy will be developed and a market study and technology promotion will be pursued.

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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 / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		Indicate: ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
MYRiAD	Multi-array room acoustic database	E	D	S	WAV	<100GB	
CIPIC	HRTF database	E	D	S	WAV	<1GB	
KU100	HRTF database	E	D	S	WAV	<1GB	
RASTAFARI	Moving dummy head and microphone array database	N	D	S	WAV	<100GB	

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:

MYRiAD: https://zenodo.org/records/7389996
CIPIC: https://github.com/amini-allight/cipic-hrtf-database
KU100: https://zenodo.org/records/3928297

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, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- 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.

- Yes

The work that will be carried out in the project has potential for commercial valorisation, however, this potential lies in the methods and algorithms that will be developed and not in the datasets that will be generated.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or 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

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).

The equipment used to generate and record the sound signals will be detailed in a rich text document. Pictures of the experimental setup will be included in this document as well. This document will be published along with the data.

All source and microphone positions used for the sound generation and recording will be accurately measured and their 3-D coordinates will be saved in a CSV file. For sources and microphones that follow a dynamic spatial trajectory during the recordings, the 3-D coordinates of a set of positions along the trajectory will be saved in a CSV file along with the corresponding time stamps. These CSV files will also be published along with the data.

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- Yes

We will use standard AES69-2022.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Other (specify below)

The data generated in the course of the project will be stored on storage facilities of the research unit.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

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

- Yes

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

The storage used by the research unit is backed up daily. The backup process is managed by the IT division of the department (ESAT). For all data stored in the department's servers, access is regulated by an access control list (ACL) that grants read-write access to the project owner and read-only access to specific users. The ACL is managed by the project owner. Client computers can access the data using: SMB2 (or higher) from specific IP ranges NFSv4 from specific (IT managed) systems.

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

The storage facilities of the research unit are currently available at no cost.

Data Preservation after the end of the Research Project

Which data will be retained for 10 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 for 10 years according to KU Leuven RDM policy

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

- Shared network drive (J-drive)
- Large Volume Storage (longterm for large volumes)

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

The storage facilities of the research unit are available for the researchers for free.

Data Sharing and Reuse

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

- Yes, as open data

The dataset labeled above as RASTAFARI (temporary name) will be made available as open data. The data that will be made available consist

of room impulse response measurements (WAV format), loudspeaker and microphone signals (WAV format) and metadata (SOFA format of AES69-2022 standard).

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

N/A

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 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.

- Other data repository (specify below)

Zenodo

When will the data be made available?

- Other (specify below)

As soon as the data have been measured and processed, and the metadata have been finalized. Estimated date: September 2024.

Which data usage licenses are you going to provide?

If none, please explain why.

- CC-BY 4.0 (data)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- Yes, a PID will be added upon deposit in a data repository

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

No data sharing costs are expected (Zenodo)

Responsibilities

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

The PI (Toon van Waterschoot) will be responsible for data documentation and metadata.

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

The IT division of the department (ESAT) will be responsible for the data storage and back-up during the project.

Who will manage data preservation and sharing?

The PI (Toon van Waterschoot) will be responsible for the data preservation and reuse.

Who will update and implement this DMP?

The PI (Toon van Waterschoot) bears the end responsibility of updating and implementing this DMP.