DMP title

Project Name C2 PA based Polar Scan

Project Identifier C24E/21/022

Grant Title C24E/21/022

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Description The objective of the fundamental research project "Next-generation phased array based Ultrasonic Polar Scan (UPS) system for the characterization of visco-elastic materials" is to develop a compact prototype of a UPS, based on a previously developed and numerically simulated design, which is user-friendly and can be flexibly used in industrial applications of ultrasonic non-destructive testing. For this purpose, some technical steps have to be taken: the modular assembly of cylindrical transducers for excitation with phased array receivers on a circular arc with special attention to the reduction of crosstalk, development of a rotation mechanism to rotate the arc around its zenith, optimization of the water/gel coupling between the transmitter-receivers and the object to be inspected, performance testing of the system on metals and composites, and global optimization of the system. The research questions to be addressed are thus connected to the technical issues in the development and optimisation of the prototype. The data to be collected and created are hardware and software design specifications, as well as scripts to control, record and analyse experimental reflection and transmission signals at ultrasonic frequencies,

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1. Data Description

What data will you collect or create? Fill out the table below and/or describe.

Type of data	Format	Volume	How created?
Equipment specifications, design requirements, assemblage arrangements and protocols	Manuscripts, PowerPoint presentations, posters (formats: .docx, .pptx, .pdf)	20GB	Computer task
Equipment control software	LabView Virtual Instruments .vi format	20GB	Computer task
Raw data from experiments	NI-technical data management solution or .tdms format	5TB	Observations from UPS scans on solids
Processed data containing tables of analyzed data from ultrasonic measurements and other NDE investigations, and correlations between data sets	formats: .xlsx, .mat, .fig	250GB	Computer task
MATLAB codes for analysis/signal processing and analytical forward and inversion models for feature and parameter extraction	formats: .m, .mlapp	20GB	Computer task

Do you intend to reuse existing data?

no

Do you use personal data (i.e. all data possibly identifying an individual)?

- No

2. Documentation and Metadata

Describe the documentation that will be created for the data. This section deals with the way in which you will document how the dataset was created and subsequently processed.

1) Hardware and software design specifications will be described in detail in a lab book.

2) Raw data will be collected per test, including a txt file with a clear description of what the data represent and how they were generated. The name of the folder will contain the sample ID under consideration and a reference to the conditions of the experiment (A .txt file explaining the naming will be maintained).

3) Processed data and images will be kept in the same folder as the raw data. A ReadMe file of the image collection will be written.

Describe the metadata for the data. This section deals with metadata: information contained in your dataset about the research data.

To our knowledge, there is no standard available yet for the kind of data that we will generate. All files will be named with a structured file name (initials, date, description of exp). The file names together with the dates of creation allow quick reference to the lab-notebook, where the assembly actions and/or specific experiment(s) are described with more detailed parameters (time, consignee, protocol, hardware settings, control software, samples names, conditions, ...). For extremely large amounts of data and easier recollection of data, the use of sql database will be explored in order to make the data better accessible to other persons.

3. Ethical, Legal and Privacy Issues

Are there any ethical issues concerning the creation and/or use of the data?

There are no ethical issues.

Did you consider all issues about copyrights and IPR?

There is freedom to operate. If successful, the prototype could lead to valorisation at the end of the project. LRD will be contacted to assist in the process. Care wil be taken not to publish the findings before starting the IPR process.

Are the collected data considered to be â€œdata containing personal informationâ€ and are all the requirements about the collection of these data met?

No. We will not use personal data. All data will refer to materials.

4. Data storage and Backup during Research

How and where will the data be stored during research?

- Centrally on storage facilities of the research unit
- Centrally on storage facilities of the university

KU Leuven OneDrive provides storage capacity, with controlled sharing. All 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.

The research unit will also keep copies of the data. Most of the data will also be stored on the pc of one or several of the researchers involved in the project.

Which back-up procedures are in place?

All data will be stored on the university’s central servers with automatic back-up procedures for at least 5 years, conform the KU Leuven RDM policy.

Describe the data security procedures and who has access to the data.

KU Leuven OneDrive provides storage capacity, with controlled sharing. Sharing will be limited to members of the research unit. People from outside can get access upon request.

5. Data selection and Preservation after Research

What is the long-term preservation plan for these dataset(s)?

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.

Data Selection: Which data will have long time value for the research and will be preserved?

This project will generate a large volume of data, some of which may not be appropriate for sharing since it involves an extensive dataset of time signals. The investigators will work with staff of the KU Leuven Libraries to determine what to archive. It makes no sense to store all time signals, instead, the processed data will be stored for at least 10 years.

6. Data Sharing

Are there any restrictions for sharing the data?

Data connected to the design and assembly of the various parts in the prototype are restricted to the research unit.

For pure reasearch data collected on material samples, there is no confidentiality.

If there are no restrictions, which mechanisms will be in place to assure that the data are discoverable, accessible and intelligible?

Upon request, the full dataset will be available after signing a data sharing agreement and can be used by anyone and for any purpose, provided that they give appropriate credit, i.e. reference to the related publications and/or doi of the data set

How will you share the data?

- Repository
- Publication

Data will be available on request after signing a data sharing agreement. The procedure for requesting access to data is available on the project website.

With whom will the data be shared?

- On request with peers only

Access will be considered after a request is submitted explaining the planned reuse. Only uses for research purposes will be allowed and commercial reuse will be excluded.

7. Responsabilities and Resources

Who is responsible for Data Management during the project? This will be the person who might receive questions on the data management aspects of the research project.

The PI bears the end responsibility of updating & implementing this DMP.

All researchers will be responsible for putting the data they generated within this project on the KU Leuven OneDrive archive space.

Which additional resources are needed for the execution of the Data Management Plan?

The cost for data storage would be max 300 euro/year and we expect to have follow-up projects on which we can book these costs after the project ends.

There are no extra costs associated with the data sharing.

Did you read the KU Leuven Data Management Policy? (find the link to the policy in the guidance).

- Yes