Digitalization utilizing physical s-ensor integration in additive manufacturing - EU Project

A Data Management Plan created using DMPonline

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Project abstract:

The project focus on optimizing to Additive manufacturing process systems. This is achieved by physical sensor integration at strategic locations, where the data can be utilized for creating a feedback-loop and give more process control. The project can be coarsely divided into 4 phases. Phase 1 - Intimately understanding the processes Phase 2- Strategically sensorize systems Phase 3 - Data analysis and cause-effect relationships Phase 4 - Data tunneling setup for statistical multiphysics and AI models. The overall objective is therefore to achieve fundamental understanding of the 2 am systems, their process parameters and cause-efffect relationship in order to optimized the systems further.

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Data Collection

- **What type of data will be collected?**

The collected will be temrpeature fields for the 2 process "beds" and laser scan system for belt transfer, pressure transducer and temperature probes at strategic locations.

- **How will the data be collected?**

The data will be collected using costume GUI's for the camera or DAQ systems allready related to the processes. Some data has allready been collected using a NI DAQ aswell.

- **Which file formats are the data in?**

The data will be stored in dat files preferably, it will potentially be loaded in to matlab and stored as array structure

- **What are the estimated amounts of data?**

The amount of data to be generatedc and stored will beless than 100 Gb for the sensors im integrating myself.

- **How will the data be structured?**

The data will be stored to folders related to what is being measured. Each folder will containing a readme index file for understanding the structure of the data.

- **How will the data be versioned?**

The data will have a datatime index, experimental index and process parameters (Included within the data file itself)

- **Are there any limitations on the use of existing data?**

Yes, the project is being done with a company, so the data will before any other agreement is made be stored within the companies network. THere can become limitations and having the data on the DTU network.

- **Are there any ethical or legal issues to be considered?**

Not ethical. The legal consideration are specified in a confidential and collaboration agreement between the particpations in the project.

- **Are there other external requirements?**

There are no external requirements.

Data Storage

- **Where are the raw data and results stored?**

Data will be stored initially on a dedicated drive given by the company.

- **How are the data backed up?**

The data is being backedup from the company's IT department.

- **How is access control managed?**

Acess to the data can only be achived by folder priveligies and being on the company's VPN.

- **How are data shared within the project?**

All the Phd students involved have acess to a shared drive in the company.

- **How is security for sensitive data guaranteed?**

It can only be acessed throguh a VPN on a dedicted work coimputer given by the company.

Documentation

- **Are there metadata standards?**

Not from what is known now.

- **What metadata will be included?**

Not decided yet.

- **How will the metadata be generated?**

Through data packages protocols or manually - not known atm.

- **How will data be documented?**

The data will be documented from detailed logbook of the experimentation that was being done, included next to the readme file for the data structure description.

- **How will the data be understandable for secondary users?**

Through logbooks and readme files describing what was being done and recorded.

- **How will reproducibility of results be ensured?**

The data files with have a full description of process data and settings, so it can be repeated.

Data Sharing

- **Which data will be shared?**

Images, plots, table, experimental anmd simulated data and publications.

- **Which tools/software are needed to view/visualize/analyze the data?**

Excel or matlab, from what is currently known.

- **Which data cannot be shared?**

Referenced to the agreement between the partners of the project.

- **Who will have access to the data?**

Project partners.

- **When will data be shared?**

Data will be shared to the public through paper publications.

- **Where will data be shared?**

Data will be through data.dtu.dk or other currently unknown solutions.

- **How will the data be made discoverable?**

Data will be shared by links/DOI in tyhe publications.

Long-term Preservation

- **Which criteria will be used to select the data that should be archived for preservation and long-term access?**

All the data related to the publications will be archieved and made avaialble.

- **Where will data be archived?**

Data will be stored at DTU data.

- **How will readability of the data be guaranteed?**

The data will be stored in standard formats, such as DAT or txt.

- **Which data has to be destroyed?**

Currently unknown, but preferably none.

- **Who will be responsible for long-term preservation?**

Me who will pass the information on to the perservation service at IT.

- **How long should the data be preserved?**

The data will preferably be perserved for 10 years +.

- **How will long-term preservation be financed?**

Depends on the dataoutcome. The currently plan is to use a tape storage, which has no costs for the project.