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HYbrid FLying rollIng with-snakE-aRm robot for contact inSpection

HYFLIERS

D8.2

Data Management Plan

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Abstract:

This living document is the updatable repository for the data management plan adopted in HYFLIERS project.

Keywords:

Data management. Data protection. Ethics. GDPR. Horizon 2020. Open access.

History of Changes

Item	Date	Details
0	2018-06-29	Initial DMP. First version 1.0.
1	2020-02-29	Version 2.0: Project website address added to the Project overview section. In section 1, added clarification about data collection (also with the addition of references to D4.1 about measurement data and its usage and to D9.1 about open data) type, format and size of the collected data (subsections 1.2, 1.3 and 1.5, respectively). Minor text improvements (readability). Added to section 4 a reference to D9.1 about security, including data storage. Section 5 extended with the addition of relevant sources (EC ethics guidelines, GDPR). List of references expanded.

Executive summary

This living document is the updatable repository for the data management plan (DMP) adopted in the HYFLIERS project. The first version is the Initial DMP and it will be followed by a Detailed DMP and finally by the Final review. Intermediate versions will be generated as needed.

The Horizon 2020 Open Research Data Pilot (ORD pilot) is about developing and keeping up-to-date a DMP concerning data deposited in a research data repository to allow third parties to access and exploit them. To enable that, data format and, if applicable, the needed tools to access data should be indicated in the documentation. The pilot applies to the data and metadata needed to validate results in scientific publications and other possible curated and/or raw data and metadata specified in the DMP.

This document has been created with the aid of the DMPTuuli tool (`https://www.dmptuuli.fi/`), available at the University of Oulu (UOULU). DMPTuuli is based on the DMPonline code, developed by the UK's Digital Curation Centre. More specifically, this report is based on the DMPTuuli template for "European Commission (Horizon 2020)" project, which in turn is based on the template [EC_Fair2016] provided by the European Commission (EC) through the replication by the above Digital Curation Centre. The output of the tool has been reformatted to make the result homogeneous with the rest of the HYFLIERS project deliverables.

Abbreviations and symbols

DMP	data management plan
EU	European Union
FAIR	findable, accessible, interoperable and re-usable
GDPR	general data protection regulation
HYFLIERS	Hybrid flying rolling with-snake-arm robot for contact inspection
IPR	intellectual property rights
ORD	Open Research Data
ORDP	ORD Pilot
UK	United Kingdom
UOULU	University of Oulu

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Foreword

HYFLIERS project favours open access to its scientific publications. Correspondingly, the project also strives to make openly available the corresponding research data. *Aware of the possible limitations due to intellectual property rights (IPR) and other possible industry secrets, HYFLIERS will adopt the principle of being "as open as possible, as closed as necessary", stated by the European Commission* [EC_Fair2016].

This document focuses on the data management plan concerning the Horizon 2020 open research data pilot (ORDP). As such, this deliverable describes in sections 1 and 2 the management of *data made publicly available* in order to allow reproducing and/or reusing the results presented in HYFLIERS scientific publications, see section 1.6.

The following section provides an overview of the HYFLIERS project aims, addressing in particular data collection and their use in HYFLIERS project *within the scope of the ORDP*.

Project overview (concerning data management)

The main objective of HYFLIERS is the development, integration and validation of a robotic system with unprecedented accurate motion and manipulation capabilities enabled by hybrid aerial and ground locomotion and to a snake-type hyper-redundant lightweight arm. The robot will be able to perform contact inspection in locations very difficult to access, therefore avoiding dangerous and costly work. A public description of the project and its progress is available at the project's web site: `http://hyfliers-project.eu/`.

The project's activities include testing of autonomous or partially autonomous aerial vehicles. To aid flying or inspections, these robotic vehicles may collect various kinds of data.

The collection of personal information is not a target of HYFLIERS project. If during project implementation it would be evident that personal information about the project participants is likely to be collected, proper protocols will be documented with following versions of this living document, as appropriated. Protocols have been already drafted and outlined in [D9.1], allowing to promptly set the required procedures in place. In any case, during the project implementation only partner sites and partner staff could be involved, with the exception of demonstrations, to which selected persons outside HYFLIERS teams could be invited.

All HYFLIERS data are stored with the relevant privacy and security protection measures, as required by (i.e., depending on) the nature of the data in subject.

All HYFLIERS consortium partners and involved personnel are required to be familiar with, and operate complying to EU general data protection regulation (GDPR).

1. Data summary

Details about measurement data are described in [D4.1]. In the framework of a data management plan with reference to the Open Research Data Pilot, the details about data are brought to D8.2 only for those data that could be made available publicly. When data would be made openly accessible, relevant information from D4.1 (R, CO) [D4.1] would be transferred to this report. The HYFLIERS consortium constantly considers the possibility to open some project data. Further versions of this Data Management Plan D8.2 will be delivered as appropriated.

1.1. Purpose of the collected data and relation to the project objectives

The data collected for performance evaluation may concern flight and/or inspection operations (see section on Project overview).

1.2. Type of collected data

The type of the open data is unknown at the time of writing. This section will describe the type of collected data that can be made openly available. *If and when needed, relevant information from D4.1 (R, CO) [D4.1] would be transferred here, as appropriated.*

1.3. Format of the collected data

The format of the open data is unknown at the time of writing. This section will describe the format of each type of collected data that can be made openly available. *If and when needed, relevant information from D4.1 (R, CO) [D4.1] would be transferred here, as appropriated.*

The format of the collected data is agreed during the project implementation. The selection of the most appropriate format is done also considering their wider availability through open access.

Standard formats guarantee larger data reuse, but they also ease future availability, since access to specific and custom data format may not necessarily be possible in the future. For this reason, standard formats are preferred, but formats typically in use in the field or by the project's stakeholders are also considered, and their adoption critically evaluated considering the above baseline motivations about data dependability.

1.4. Origin of the data

In addition to the data generated during the project, pre-existing data could be used, for example for performance analysis and validation. When those data are managed within HYFLIERS project, the same principles and procedures are adopted and implemented as for the data generated within the project. However, making openly available pre-existing data may be subject to even stronger constraints than the data generated within HYFLIERS, making potentially more difficult their open availability.

1.5. Size of the data

The size of the open data is unknown at the time of writing. This section will describe the size of each type of collected data that can be made openly available. *If and when needed, relevant information from D4.1 (R, CO) [D4.1] would be transferred here, as appropriated.*

It is clear that whenever video images are collected, the total size may grow considerably. When large data are made available, they will be placed in compressed archives, to alleviate both storage and transmission burdens.

1.6. Data utility

The first goal of data collection is to support the research work carried on in the project. The second goal is to serve the project's stakeholders interests. The third goal is to contribute to the wider advance of science and technology.

In addition to serving reproducibility, HYFLIERS research data could potentially offer access to realistic experimental conditions without the need to physically access the respective scenarios. Nevertheless, utility might be limited if conditions will be too specific. Caveat concerning the feasibility are given in section 2.2 below.

2. FAIR data

This section discusses how data can be made Findable, Accessible, Interoperable and Re-usable (FAIR).

2.1. Making data findable, including provisions for metadata

All metadata possibly useful for further analysis will be attached to the data. The type of the metadata deemed useful will be agreed during the project implementation. Naming conventions will also be agreed during the project implementation. All the relevant keywords useful to improve visibility of the data will be added. Keywords will be searched from all the scientific fields touched by the research as well as from the relevant industry jargon. Suitable metadata standards will be used, if available/applicable.

It will be also considered the presence of the data on relevant services, such as for example the Etsin service (`https://etsin.avointiede.fi/en/`; and/or AVAA or IDA, see section 3) provided by the Finnish Open Science and Research Initiative (`https://openscience.fi/`). Moreover, availability of open data will be advertised, including the use of social media.

2.2. Making data openly accessible

Since industrial operations and areas may be the subject of data collection, it will be carefully analysed which data can be made public without infringements. Indeed, *the European Commission [EC_Fair2016] observes that there is a need to balance openness and intellectual property rights (IPR). For example, data possibly collected in HYFLIERS project might include sensitive locations, and/or disclose details deemed by consortium partners to be industry/commercial secrets, including technologies subject to patenting with a related embargo period.*

Whenever data would be deemed publishable, this will happen through the channels available to the consortium partners, including the coordinator. The repositories will be agreed during the project implementation when the need to disclose data will become evident.

Relevant publications (articles and/or deliverables) will be linked logically to the datasets, providing reference and documentation. The parallel publishing portal of coordinator partner University of Oulu Jultika (`http://jultika.oulu.fi/`) provides persistent links that could be exploited to further improve reachability of the data, in addition to the indexing specific to data sets (see section 2.1). Additional technical documentation will be generated as needed and made available through the same channels the data will be made available.

The most relevant sharing licence, for example those under Creative Commons, will be selected during the project implementation and agreed within the consortium. When this issue will become

timely, relevant tools, such as EUDAT B2SHARE (https://b2share.eudat.eu/) [EC_Fair2016] will be taken under consideration.

The access methods to the data will also be agreed within the consortium. Example options include anonymous access and free access upon registration.

2.3. Making data interoperable

Data interoperability is related to their format, see section 1.3.

2.4. Increase data re-use (through clarifying licenses)

The licensing of data is discussed above in section 2.2. In the same section are also discussed the conditions allowing data to be made public and the reasons why this could not be possible.

The availability of the data after the project and possible embargo periods will be agreed during the project implementation.

3. Allocation of resources

The repository for open data will be agreed during the project implementation; see also the related discussions in sections 2.1 and 2.2. Costs of the above services for the project could be null or close to null, if e.g. are used services provided by UOULU or by the Open Science and Research Initiative (https://openscience.fi/), e.g. the Open research data publishing platform AVAA (Avointen tutkimusaineistojen julkaisualusta, https://openscience.fi/avaa) or the Research data storage IDA (Tutkimusdatan säilytyspalvelu, https://openscience.fi/ida). This signifies that the lack of invoicing for data management would not necessarily mean that nothing is done for that.

4. Data security

Data will be stored with relevant information security measures, protecting confidentiality through access control, as well as integrity and availability through back-ups. The above principle will guide the selection of technical solutions and services that will be used.

Closer to the data collection process in the specific case personal data would be planned to be collected or used (see also section 1.4), responsibilities will be defined as will be defined the conditions and rules for granting access to the data collected and used in the project.

Security in general and in the case of personal data is thoroughly addressed in deliverable [D9.1].

5. Ethical aspects

Ethical standards and guidelines of Horizon 2020 are rigorously applied in HYFLIERS, regardless of the country in which the research is carried out. More in particular, HYFLIERS will follow the H2020 guidelines on ethics in [ECDGRI2019], adopting the General Data Protection Regulation GDPR [CELEX32016R0679] when applicable. Ethical issues are covered in a wider scope in the dedicated deliverable [D9.1].

References

CELEX32016R0679 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the

processing of personal data and on the free movement of such data, and repealing directive 95/46/EC (General Data Protection Regulation. Official Journal of the European Union L 119, 1—88.

ECDGRI2019 European Commission Directorate-General for Research & Innovation (2019) Horizon 2020 Programme Guidance How to complete your ethics self-assessment. Version 6.1, 4 Feb.

D4.1 Celentano U, ed. (2020) Measurement data management service and path planning algorithm. HYFLIERS project deliverable D4.1. Version 2.0. 29 Feb.

D9.1 Röning J, ed. (2020) NEC Requirement No. 1. HYFLIERS project deliverable D4.1. Version 2.0. 29 Feb.

EC_Fair2016 European Commission, Directorate General for Research & Innovation (2016) H2020 Programme Guidelines on FAIR Data Management in Horizon 2020. Version 3.0. 26 Jul.[1]

[1] PDF of the document https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf. See also http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/data-management_en.htm, last retrieved 18 May 2018.