

Načrt ravnanja z raziskovalnimi podatki (NRRP) – obveznost za doktorske študente na Univerzi v Ljubljani

Data Management Plan (DMP) – obligation for PhD Students at University of Ljubljana

Seminar za doktorske študente

Skripta s teoretičnimi osnovami in praktičnimi navodili za samostojno izpolnjevanje načrta ravnanja z raziskovalnimi podatki ter napotki za oddajo na univerzitetni podatkovni repozitorij RUL

Seminar for doctoral students

A manual with theoretical foundations and practical instructions for independently completing a research data management plan, along with guidelines for submission to the university data repository RUL

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Ljubljana, 2026

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Načrt ravnanja z raziskovalnimi podatki (NRRP) – obveznost za doktorske študente na Univerzi v Ljubljani Data Management Plan (DMP) – obligation for PhD Students @ University of Ljubljana

Seminar for PhD Students

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University of Ljubljana, Faculty of Mechanical Engineering, 21.5.2026

Based on the template by dr. Urša Opara Krašovec, UL FE, ursa.opara@fe.uni-lj.si





Content

- Open science
 - FAIR principles
 - Research data
 - Ethics and Integrity in research
 - AI in research
- DMP for PhD students @ UL
- *Repository of the University of Ljubljana (RUL)*
- *README* file
- Who can help me?

DMP - Practical example with supplementary files



Introduction to Open science

- is the movement to make scientific research and its dissemination accessible to all levels of society
- mandates the immediate openness of peer-reviewed publications and the **management of research data**, in accordance with **FAIR principles**, and access to data via a repository based on the principle “*as open as possible and as closed as necessary*”.





Why?

- access to data for other users for the purpose of gaining new insights with the possibility of collaboration
- transparency and verifiability of results based on research data
- overview of the scope and content of data generated in research projects at the institution
- protection of data against loss
- compliance with rules and legal obligations
- security and protection when handling sensitive data and against unauthorized access
- the reputation of researchers and higher evaluation of their work through data citation and additional entries in personal bibliography
- AI learning, data mining
- ...



Scientific knowledge



Research data

(measurements, simulations,
calculations, code...)

Research publication

(research papers)



In accordance with the Article 50 of the *Rules and Regulations for Doctoral Studies* at the University of Ljubljana PhD Students are obliged to:

- Develop a **Data Management Plan (DMP)** (Načrt ravnanja z raziskovalnimi podatki (NRRP))

(The first version upon submission of the doctoral dissertation proposal in 2nd year, an updated version before the presentation of the results of my research work, the final version included in doctoral dissertation)

- Publish research data in a manner that best complies with **FAIR principles**
- Publish research data in a **repository**
- Enable access to the research data on principle “**as open as possible and as closed as necessary**”
- Publish research publications in a **repository**

[Pravilnik o doktorskem študiju UL](#) - Rules and Regulations for
Doctoral Studies at the University of Ljubljana (Link ->)





FAIR principles



FAIR Principles

Principles according to which research data (digital objects) must be published in such a way that they are:

- F**indable – *najdljivi* *Persistent identifier (PID), metadata, keywords*
- A**ccessible – *dostopni* *When and for how long, restricted access, need for additional documentation or software*
- I**nteroperable – *interoperabilni* *Data exchange possible, appropriate formats*
- R**eusable – *uporabljivi* *Adequate documentation, license, e.g., [CC-BY](#) or CC0, data quality*

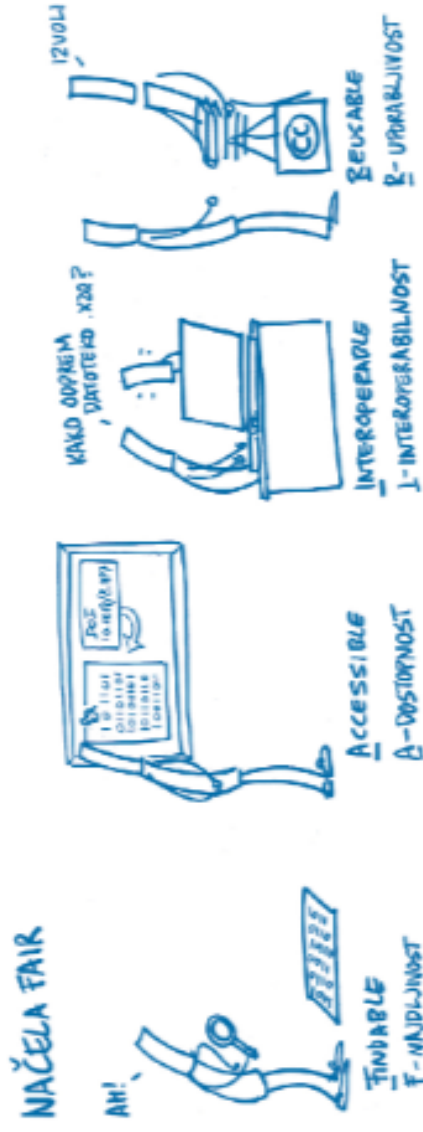


- [The FAIR Guiding Principles](#)

<https://www.nature.com/articles/sdata201618>

→ - Spoznaj FAIR: priročnik o odprti znanosti v Sloveniji

<https://www.hippocampus.si/ISBN/978-961-293-328-9.pdf>





For data to be FAIR, it must be published

- in an appropriate Repository, with persistent identifiers (PIDs)
- in the appropriate format
- together with relevant content metadata and documentation: all information necessary for the reuse or validation of research data must be accessible via the repository
- under a licence that stipulates the conditions for reuse in detail
 - **CC - BY** (open license with author attribution) or a license with equivalent rights
- *with an appropriate statement on access to data in the related research publication (project)*



„As open as possible, as closed as necessary“

All data, *including raw data*, should be open, except for justified exceptions. They must be accompanied by all documents (e.g., research protocols) describing how the data were obtained.





Eligible exemptions from openness

These exemptions can be claimed in cases where:

- open access to the data would **jeopardise the legitimate interests of the beneficiary**, including commercial exploitation (e.g., in the case of a planned patent application or trade secret protection)
- open access would conflict with any other restrictions, in particular with the **competing interests of the EU/Slovenia or the beneficiary's obligations under the funding agreement** (e.g., protection of personal data, statutory secrecy, non-disclosure of endangered areas, groups or species, etc.)
- **national security and other legal restrictions**



Eligible exemptions from openness, BUT

- The justification for the exception must be explained in the DMP.
- In justified exceptions, research data and other research results should, **where possible, be openly accessible in anonymized or pseudonymization form or subject to controlled restricted access.**
- Where research data and other research results cannot be made openly accessible due to justified exceptions and there are no legal restrictions preventing the related metadata from being openly accessible, **at least the metadata should be made openly accessible.**



What are research data?



Definitions

Springer Nature:

*“Research data refers to the collection of files that support your research project, study or publication such as **spreadsheets, documents, images, videos or audio**”.*

CODATA (Committee on Data, International Science Council):

*“Data that are used as primary sources to support technical or scientific enquiry, research, scholarship, or artistic activity, and that are used as evidence in the research process and/or are commonly accepted in the research community as necessary to validate research findings and results. All other digital and non-digital content have the potential of becoming research data. Research data may be **experimental data, observational data, operational data, third party data, public sector data, monitoring data, processed data, or repurposed data**”.*

<https://dirrosdata.ck.uni-lj.si/raziskovalni-podatki/>



Your data management practice will be dictated by the types of data that you work with, and what format they are in.



Data types generally fall into five categories:

Observational

- Captured *in situ*

- Can't be recaptured, recreated or replaced

Examples: Sensor readings, sensory (human) observations, survey results

Experimental

- Data collected under controlled conditions, *in situ* or laboratory-based

- Should be reproducible, but can be expensive

Examples: gene sequences, chromatograms, spectroscopy, microscopy

Derived or compiled

- Reproducible, but can be very expensive

Examples: text and data mining, derived variables, compiled database, 3D models

Simulation

- Results from using a model to study the behavior and performance of an actual or theoretical system

- Models and metadata, where the input can be more important than output data

Examples: climate models, economic models, biogeochemical models

Reference or canonical

- Static or organic collection [peer-reviewed] datasets, most probably published and/or curated.

Examples: gene sequence databanks, chemical structures, census data, spatial data portals



Data format

General recommendations:

- non-proprietary
- use file formats that are likely to remain accessible for the foreseeable future
- commonly used by the research community
- unencrypted
- uncompressed

Type of data	Recommended formats	Other acceptable formats
Quantitative tabular data with extensive metadata.	Proprietary formats of statistical packages e.g. SPSS (.sav), Stata (.dta), .sas7bdat.	
A dataset with variable labels, code labels, and defined missing values. In addition to the matrix of data.	Delimited text and command ('setup') file (SPSS, Stata, SAS, etc.) containing metadata information. Some structured text or mark-up file containing metadata information, e.g. DDI XML file.	SPSS portable format (.por). MS Access (.mdb/.accdb).
Quantitative tabular data with minimal metadata.	Comma-separated values (CSV) file (.csv).	
A matrix of data with or without column headings or variable names, but no other metadata or labeling.	Tab-delimited file (.tab). Including delimited text of given character set with SQL data definition statements where appropriate.	Delimited text of given character set – only characters not present in the data may be used as delimiters (.txt). Widely-used formats: MS Excel (.xls/.xlsx), MS Access (.mdb/.accdb), OpenDocument Spreadsheet (.ods).
Geospatial data.	ESRI Shapefile (essential – .shp, .shx, .dbf, optional – .prj, .sbx, .sbn).	ESRI Geodatabase format (.mdb).
Vector and raster data.	Geo-referenced TIFF (.tif, .tiff). CAD data (.dwg). Tabular GIS attribute data.	MapInfo Interchange Format (.mif) for vector data. Keyhole Mark-up Language (.kml). Adobe Illustrator (.ai), CAD data (.dxf or .svg). Binary formats of GIS and CAD packages.
Qualitative data.	eXtensible Mark-up Language (XML) text according to an appropriate Document Type Definition (DTD) or schema (.xml).	Hypertext Mark-up Language (.html).
Textual.	Rich Text Format (.rtf). Plain text data, ASCII (.txt).	Widely-used formats: MS Word (.doc/.docx). Some software-specific formats: NUD*IST, NVivo and ATLAS.ti.





Data format cont.

Digital image data.	TIFF version 6 uncompressed (.tif).	TIFF (other versions) (.tif, .tiff).
	Digital Imaging and Communications in Medicine (DICOM) (.dcm, .dcm30) – for CT/MRI data.	Adobe Portable Document Format (PDF/A, PDF) (.pdf) Standard applicable RAW image format (.raw). Photoshop files (.psd). BMP (.bmp) but only if created in this format. PNG (.png) but only if created in this format.
Digital audio data.	Free Lossless Audio Codec (FLAC) (.flac).	MPEG-1 Audio Layer 3 (.mp3) if original created in this format. Audio Interchange File Format (.aif). Waveform Audio Format (.wav).
	MPEG-4 (.mp4).	MOV (.mov)
Digital video data.	OGG video (.ogv, .ogg). motion JPEG 2000 (.mj2).	Windows Media Video (WMV) (.wmv). WebM (.webm).
	Rich Text Format (.rtf). PDF/A or PDF (.pdf). HTML (.htm).	Plain text (.txt). Widely-used proprietary formats: MS Word (.doc/.docx), MS Excel (.xls/.xlsx).
Documentation and scripts.	OpenDocument Text (.odt).	XML marked-up text (.xml) according to an appropriate DTD or schema, e.g. XHTML 1.0.
	R Markdown files (.rmd) (with HTML version as well).	



Which data should be published?

In a practical context... you can't save and manage every digital bit that you've ever collected

“Put yourself in someone else's shoes.”

- Consider what set of files and information you would need to provide if someone would like to validate your published research findings
- Consider what would be useful to you or others if you had to reproduce your results
- An example, raw data files may be critical in the initial processing phase of research project, but they might become useless after the data have been converted to a more workable format (e.g. binary instrument output converted to CSV file).



Where data should be published?

1. Domain-specific data repository (domain specific metadata)

Two domain-specific data repositories in Slovenia:

- Social Science Data Archives (ADP)
- CLARIN.SI for language resources and technologies

2. Institutional: Repository of the University of Ljubljana ([RUL](#)) -> **Readme file!!**

3. International: Zenodo (zenodo.org) - powered by CERN Data Centre & InvenioRDM; Mendeley Data...

To search for other type data Repositories: re3data.org and FAIRsharing.org
[ARIS recommendations for trusted repositories](#)



Notes

- ! In a Repository data can be open, temporarily unavailable or restricted (or data not available, just Readme file/Meta file).
- ! Size limitations might apply.
- ! Repository can specify submission rules
- ! Publisher websites and platforms such as Academia.edu and ResearchGate are **NOT repositories (no PID)**!



Ethics and integrity in research



- > Committees for research ethics and integrity
- > Ethics assessment of research involving human subjects
- > Management of financial conflict of interest in US projects
- > Handling research misconduct

Codes of Ethics and Integrity

The [Code of Ethics for Researchers at the University of Ljubljana](#) ² addresses general ethical issues that arise in any research work. Each individual is responsible for

Information sheet

Good scientific practices, responsible and ethical research

Most of the information below (incl. this document) can be found on the website 'Ethics and integrity in research' <https://www.un-lj.si/en/research/ethics-and-integrity-in-research>



Codes of ethics and integrity

The European Code of Conduct for Research Integrity (ALLER code) defines ethical principles, standards, and good research practices as well as violations of research integrity.

The Code of Ethics for Researchers at the University of Ljubljana addresses general ethical issues that arise in all research work.

The Code of Ethics of the University of Ljubljana contains the fundamental values of the university, its goals, and the minimum ethical conduct expected of its employees and students.

Committees for assessment of various ethical issues

Committee for ethical issues (REV.UU) assesses violations of ethics and integrity (Etiska Komittén/Bioethik).

Committee on Ethics in Research involving Human Subjects (KEM, UU) decides on applications for the assessment of the ethical adequacy of research conducted within the framework of UU, or in which third-party students of UU employ, participate as researchers, and which involves work with people and must be carried out at the university level due to the multidisciplinary nature of the research or because the researchers come from a U+ member where no such committee exists (KEM/G-Cell/et).

Committees at U+ members (ECU, ES, ES-EPF, ETV, FE, BE, BE-INTS, TYPOL, UNIL and national ones) (for medical use, for animal use)

Ethics assessment of research

Research involving human subjects should follow the subject's ethical conduct in research involving human subjects for general ethical guidelines for various research areas can also be found in the guidance – ethics in social sciences and humanities (European Union) and in the EU guidance on how to complete your ethics self-assessment.

The research involves the processing of personal data (which also comprises research involving people), the General Data Protection Regulation (GDPR) and the Personal Data Protection Act (PDPA) must be complied with.

Submitting your application for ethical review of your research to the appropriate authority (at the national or university level) or at the level of the member states requires the research protocol approved by them must then be followed in full.

Ethical publishing of research results

Agree on authority or co-authorship (including anticipated contributions and order of authors) early enough to align expectations and avoid potential misunderstandings. In the case of co-authorship, it is essential to define the role of each author at the time you agree to work together. The order of names on the paper reflects the relative contribution made by each author. It is useful to write up agreed credit (Contributor Role Taxonomy) lists of roles.

Citing affiliation with UL is mandatory for all works prepared during employment at UL. This also applies to all publications related to research work within the Framework of Doctoral studies, even in cases where the doctoral student, mentor, and co-mentor are employed by another organisation (Rules on Doctoral Studies), in line with the UL Senate decision of 23 Oct. 2018, all publications must first mention the name of the University of Ljubljana, then its UL member, and finally the internal unit of its member.

In addition to the national researcher code (assigned by ARIS), it is advised to also obtain an ORCID number, which is a free, unique, permanent identifier for researchers and secure your recognition in the international research community.



Ethics in Research that Includes Work with People

Ethics review at university level, Committee for Ethics in Research Involving Human Subjects (kerl@uni-lj.si)

- multidisciplinary nature of the research
- research is being conducted in a faculty where there is no such committee

For research involving work with people, **you must obtain the consent of the ethics committee**, which, *according to Article 36 of the Rules on Doctoral Studies at the University of Ljubljana*, is an **appendix to the application when submitting the dissertation proposal in the second year**.

It is recommended that you submit the application **at least two months prior to the deadline for submitting the dissertation proposal**, taking into account the summer holiday period.

[Informed consent](https://www.uni-lj.si/en/research/ethics-and-integrity-in-research/ethical-assessment-of-research-involving-human-subjects)

<https://www.uni-lj.si/en/research/ethics-and-integrity-in-research/ethical-assessment-of-research-involving-human-subjects>



Data protection Officer @ UL

- responsible for personal data protection in terms of monitoring, supervision, consulting and educating at the University of Ljubljana on the basis of the General Data Protection Regulation (GDPR, ZVOP-2).

Contact: Silvija Fanžol; dpo@uni-lj.si



Use of AI in research



Use of AI in research

It is vital to **adhere to** the same **ethical standards** as with any other type of academic work. Among other things, this includes:

- Properly citing the tools that have significantly contributed to creating the work, and recognizing the role of AI in the research process
- Checking and critically assessing the results created by AI systems, and understanding their limitations and potential bias
- Taking responsibility for the work's content and citing primary research sources – among other things, this strengthens the importance and role of digital literacy and cultivates critical thinking
- Responsibly uploading data, information and documents into AI tools. **Do not upload any personal data, confidential documents, documents for which you do not have the required authorisations or/are protected by copyright...**

Transparency of use: add a note on **why** and explain **how** you have use it

Citation: for example ChatGPT; OpenAI. (2023). ChatGPT (10 Aug. version). [Large language model]
<https://chat.openai.com/>

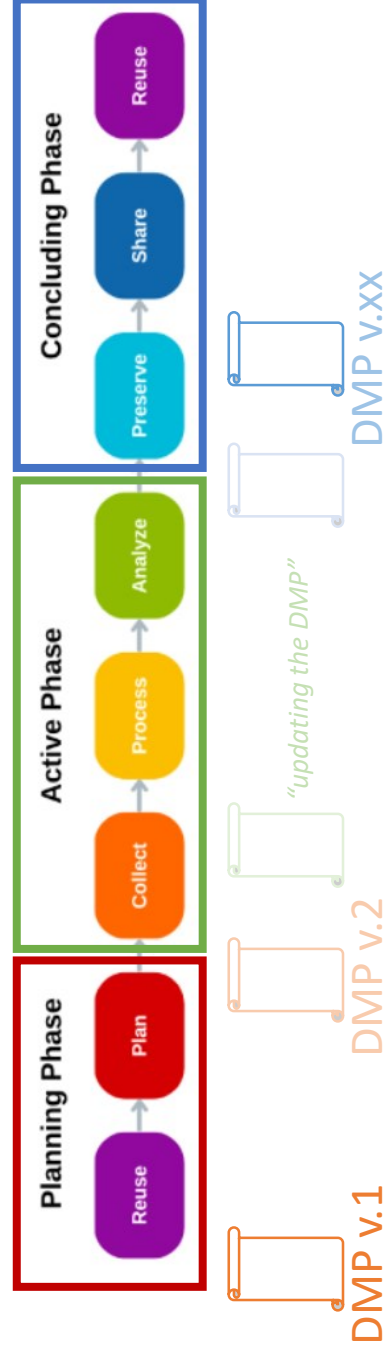
[UL Recommendations of using AI UL](#) and [Living guidelines on the responsible use of generative AI in research](#)



Data Management Plan - DMP



Determines how research data will be:
searched for, collected, stored,
documented, processed, protected,
and published.



Source: <https://guides.library.cornell.edu/dataden/lifecycle>

SPOZNAJ FAIR: Guide on the Open Science in Slovenia, <https://www.hippocampus.si/ISBN/978-961-293-328-9.pdf>



The DMP is a living document which is updated as needed during the research.

1. Two DMP templates @ UL:

- *The first template:*
 - **DMP upon submission** of the doctoral dissertation proposal in the second year
- *The second template:*
 - **up-dated DMP** written before the presentation of the results of my research work
 - **the final DMP** included in the doctoral dissertation

2. If **no research data** will be generated or reused in the course of the research work, indicate this in the DMP

Example: „Doctoral research will not involve any gathering, obtaining or generation of research data. The research will be conducted entirely theoretically.“

Primer odgovora: „Raziskovalni podatki v doktorski raziskavi ne bodo zbrani, pridobljeni ali ustvarjeni. Raziskava bo v celoti izvedena teoretično.“

3. Complete the DMP form in Word and save it as in a PDF file.

Links:

<https://www.uni-lj.si/en/study/doctoral-study/research-data-management>

<https://www.uni-lj.si/studij/doktorski-studij/ravnanje-z-raziskovalnimi-podatki>

Research Data Management

FOR UL DOCTORAL STUDENTS

WHAT DO I NEED TO DO?

Prepare a Data Management Plan (DMP) and publish the data in a **repository**.

I must publish the data in a manner that best complies with the **FAIR** principles (Findable, Accessible, Interoperable, Reusable).

The data should be as open as possible and as closed as necessary.

Rules and regulations for doctoral studies at UL



WHO CAN HELP ME?

In case I need help, I can contact a data steward.
The University of Ljubljana has a **network of data stewards and contacts** to support research data management.

I can reach them at:
raziskovalni.podatki@uni-lj.si.

DMP

The **Data Management Plan (DMP)** is a document in which I explain how I will collect, store, document, process, and publish research data, taking into account the methodology of my research.

To prepare the DMP, I can use the **DMP template for doctoral students at UL**.

The DMP is a living document which I update as needed during my research:

- the first version is prepared upon submission of the doctoral dissertation proposal in the second year,
- an updated version is written before the presentation of the results of my research work,
- the final version is included in my doctoral dissertation.

If my research is theoretical, or if I will not be using existing data or creating new data, I explain this in my DMP.

UL Doctoral school - research data



WHERE DO I PUBLISH THE DATA?

I must publish research data in a repository, preferably in a **domain-specific data repository** or in the **Repository of the University of Ljubljana (RUL)**, and state in my dissertation where they are available and how they can be accessed.

There are two domain-specific data repositories in Slovenia:

- [Social Science Data Archives \(ADP\)](#),
- [CLARIN.SI](#) for language resources and technologies.

I can use [re3data.org](#) and [FAIRsharing.org](#) to search for data repositories.

In a repository data can be open, restricted, or temporarily or permanently unavailable.

Publisher websites and platforms such as Academia.edu and ResearchGate are **NOT** repositories!

Repository of the University of Ljubljana



UNIVERZA
V LJUBLJANI

SPÖZNAJ
PODPORA PRI UVAJANJU NAČEL ODPRE ZNANOSTI V SLOVENIJI



ing

Ravnanje z raziskovalnimi podatki ZA DOKTORSKE ŠTUDENTE UL

KAJ MORAM STORITI?

Pripraviti načrt ravnanja z raziskovalnimi podatki (**NRRP**) in podatke objaviti v **repozitoriju**.

Podatke moram objaviti na način, ki čim bolj ustreza načelom **FAIR** (Findable - najdljivi, Accessible - dostopni, Interoperable - interoperabilni, Reusable - uporabljivi).

Podatki naj bodo odprti, kolikor je mogoče, in zaprti, kolikor je nujno.

Pravilnik o doktorskem študiju UL



KDO MI LAHKO POMAGA?

Za pomoč lahko pišem podatkovnemu svetovalcu. Na UL deluje mreža podatkovnih svetovalcev in kontaktnih oseb za podporo ravnanju z raziskovalnimi podatki.

Pišem jim lahko na naslov: raziskovalni.podatki@uni-lj.si.

NRRP

Načrt ravnanja z raziskovalnimi podatki (NRRP) je dokument, v katerem pojasnim, kako bom zbiral, hranil, dokumentiral, obdelal in objavil raziskovalne podatke, upoštevajoč metodologijo svoje raziskave.

Za pripravo NRRP lahko uporabim **predlogo NRRP za doktorske študente UL**.

NRRP je **živ dokument**, ki ga med raziskavo po potrebi posodabljam:

- prvo različico pripravim ob prijavi dispozicije doktorske disertacije v 2. letniku,
- posodobljeno različico napišem ob predstavitvi rezultatov raziskovalnega dela,
- končno različico vključim v doktorsko disertacijo.

Če je moja raziskava teoretična oziroma ne bom uporabil/a že obstoječih podatkov ali ustvaril/a novih, to obrazložim v NRRP.

Doktorska šola UL - raziskovalni podatki



KJE OBJAVIM PODATKE?

Raziskovalne podatke moram objaviti v repozitoriju, prednostno v **področnem podatkovnem repozitoriju** ali v **Repozitoriju UL**, ter v **disertaciji navesti, kje so dostopni in kako je mogoče dostopati do njih**.

Slovenija ima dva področna podatkovna repozitorija:

- [Arhiv družboslovnih podatkov \(ADP\)](#),
 - [CLARIN.SI](#) za jezikovne vire in tehnologije.
- Za iskanje podatkovnih repozitorijev lahko uporabljam [re3data.org](#) in [FAIRsharing.org](#).

V repozitoriju so lahko podatki odprti, omejeno dostopni ali začasno oziroma trajno nedostopni.

Spletne strani založnikov in platforme, kot sta Academia.edu ter ResearchGate, **NISO repozitoriji**

Repozitorij Univerze v Ljubljani





DMP Example

... a practical exercise follows the presentation



Repository of the University of Ljubljana (RUL)

Publishing research data



Publishing data in RUL – key steps

1. Entering bibliographic and other data
 2. Transferring files in the case of larger files (2GB and above) using iRODS commands on the Vega supercomputer
 3. Submission confirmation
- You can complete steps (1–2) gradually, i.e., you can fill in some of the information and then complete or correct it the next time you log in. You can replace a file that has already been uploaded later, before submitting the material.
 - Upon confirmation of the submission, the data will not be published immediately – it must always be confirmed by the administrator.
 - When the data is published, you will receive a notification from RUL via email.
 - Each RUL record is assigned a persistent identifier (PID) of the Handle type.



RUL

<https://repozitorij.uni-lj.si/prijava.php?lang=slv>

<https://repozitorij.uni-lj.si/prijava.php?lang=eng>

Researchers* and doctoral students at the University of Ljubljana can upload their research data in RUL themselves.

Scientific publications are uploaded by the faculty’s librarians (check with them).

**at least one author is/should a member of the UNI LJ*



Repository of the University of Ljubljana

Open Science Slovenia

Open Science

DKUL

A⁺

slv | eng

Search

Advanced

New in RUL

About RUL

In numbers

Help

Sign in

Intro

In the Repository of the University of Ljubljana (RUL) we store and make available to the public:

- Final works of studies;
- Works of analyses with CORISS technologies 1 and 2;
- Publications published by the UL libraries and academics (articles from journals, monographs, textbooks, ...);
- Research data and other types of research results (research software that is generated in research, multimedia ...).

Public availability in RUL increases visibility and impact of publications very much (see tab V številkah – Letna poročila).

Legal bases for open science are:

- Council conclusions on research assessment and implementation of open science;
- Horizon Europe (European Commission, 2021–2027), Art. 17 of the grant agreement;
- Resolution on the Slovenian scientific research and innovation strategy 2030, mostly Chapter 6.2.;
- Action plan for open science;
- Scientific research and innovation activity act, Arts. 40-42;
- Publishing research and innovation act, Arts. 63-74;
- Public information access act, Art. 6 & 7;
- Decree on the implementation of scientific research work in accordance with the principles of open science;
- Rules on conditions for providing library public service, Art. 45(3);
- The statutes of UL, Arts. 8 and 133;
- Rules on the implementation of scientific research activities, Arts. 35 and 36;
- Rules and regulations for doctoral studies at UL, Arts. 35, 43, 45 and 50;
- Strategy of UL 2022-2027, item 7.2, performance indicator RP2-K6;
- Digital strategy of UL 2024-2027, goal Research R.2 and activity 2.;
- UL Sustainability Strategy 2025–2030, sustainability topics PT3.2 and PT3.3.





Repository of the University of Ljubljana

Open Science Slovenia

Open Science

DiKUL

A⁻

A⁺

slv |

Search

Advanced

New in RUL

About RUL

In numbers

Help

Sign in

Sign in

Sign in with your UL identity.

- for UL employees who wish to upload research data or publications,
- for UL doctoral students who wish to upload research data,
- for RUL administrators.

Read *Basic instructions*

Login by using UL digital identity

Help

The content of this page will be updated with answers to frequently asked questions that will be sent to the [Contact](#).

LIST OF RUL RECORDS FOR RESEARCH DATA

On the Advanced tab, under Work type, select Research Data or Corporates and click Search.

Below is a list of RUL records for research data that have typology 2.20 entered.

DEPOSITING RESEARCH DATA IN THE RUL

Information to be prepared by researchers or PhD students when depositing research data in the RUL via their UL Digital Identity or the RUL administrator:

- Title of dataset;
- Subtitle: *research data from the project OR research data underlying the doctoral dissertation OR research data underlying the article*;
- Names of researchers that created or collected the data;
- Name of UL faculty or academy;
- Abstract;
- Keywords;
- Year of data creation/collection;
- Typology: 2.20;
- Data need to be licensed with CC BY 4.0 licence (as per Horizon Europe and Slovenian decree on open science);



1. Employee's or Student's work upload



User

Hi,

As a logged-in user, you have these additional options:



Employee's work upload

Documents with granted access

Change personal data and settings

Sign out



2. New document



Document upload for employees

Repository of University of Ljubljana is an institutional repository of scientific, research, artistic, professional and other works in higher education of University of Ljubljana. It is intended for management, conservation and accessibility of works and documents of university teachers, researchers, of other employees and student of University of Ljubljana. Works and documents are primarily available as open access.

Publication of works in RUL enhances the accessibility of public and professional exchange of scientific information, increases the potency of the research results of scientists and reputation of the university. RUL is an environment that allows for fulfillment of requirements of the European community regarding the mandatory storing of publications and research data from publicly funded research in open-access repositories.

If you want to add your work to RUL, click on "New document" button. If your work is already saved in COBISS, you can import it by clicking on "Import from COBISS" button. Additionally you can import your work from DOI, by clicking on "Import from DOI" button.

Before submitting or importing your work, please read the "Consent of publication and statement of authorship". For each submission or import we consider it as you read and agreed with the consent.

Import from COBISS	Import from DOI	New document	Access requests
ID	TITLE		
There are no records!			



<< User pages



3. Research data

Open Science Slovenia

Open Science

DIKUL

A⁺ A⁺

slo | eng

Upload starting page

Public pages

User

Document type

- ☐ Article (article in scientific or professional journal, conference contribution, etc.)
- ☐ Chapter or paragraph in a monograph
- ☐ Unpublished conference contribution, unpublished university lecture
- ☐ Conference contribution (lecture, report, poster - published in full in a separate conference proceeding or on conference or organizers web page etc.)
- ☐ Monograph or other completed work (scientific or professional monograph, scientific report, project documentation, software, manual etc.)
- ☐ Higher education textbook or other courseware
- ☐ Patent
- ☒ Research data, scientific data collection or corpus, experiment
- ☐ Research movie or documentary, audio or video record
- ☐ Work of art (poetry, prose, songs, movies, pictures, photographs or other works of art)
- ☐ Exhibition, performance, radio or TV show

Back

Continue





4. Document upload steps

Your data has not been saved yet. Data can be saved in the first upload step.

Below are the steps required for document upload. You can complete each step completely or partly, you can edit and change the data later, if necessary. You don't need to complete all steps in one session. Already uploaded files can be replaced or deleted.



1.

Bibliographic data

Enter or edit document metadata.

2.

File upload

Upload your files.

3.

Upload confirmation

Last step - confirm your upload and choose an organization. After that, a librarian of the selected organization will be automatically notified about your upload.

<< List of documents



5. Bibliographic and other metadata entry

<< Upload steps

Save 2. File upload >



Readme etc.

In main language of the work 

Language: Slovenian ▾

Title (mandatory):

Subtitle:

Abstract (maximum of 4000 characters; without "Abstract." or similar phrases):

Note: ORCID link in full format: <https://orcid.org/0000-...>



6. (a) Data transfer

Upload to RUL

Upload of big files

You need to upload at least one file.

Upload only files without any password protection!

You can upload multiple files at once, also with drag & drop. More about file upload ?

Select file

Drag and drop your files here

List of files:

Purpose	File name	Date	Size (B)	Action
List is empty!				
Choose an appropriate purpose, for example Data description, research data...				

Save purpose

Change order

<< Upload steps

< 1. Metadata entry

3. Confirm upload >



6. (a) Big data upload

Upload to RUL

Upload of big files

Upload of big files (2 GB or more) and files that are intended to be processed on supercomputers is done via iRODS system using iRODS commands. Below is a list of already uploaded files. To upload more files to iRODS, please click the "Add iRODS files" button.

List of iRODS files:

PURPOSE	FILE NAME	DATE	SIZE (B)	ACTION
There are no records!				
0 - 0 / 0				

Add / update iRODS files

Save purpose

<< Upload steps

< 1. Metadata entry

3. Similarity report >



Check (after data is being reviewed and confirmed) How to search research data in RUL ?

Advanced

Work type:

Research Data or Corporuses

▼

Language:

All languages

▼

Search in:

Faculty of Civil and Geodetic Engineering

▼

☐ Show full text results only

Search

Simple search

Title

▼

AND

▼

Author

▼

AND

▼

Abstract

▼

AND

▼

Year

▼

Results

1 result

1. [Extreme shear stresses](#)
[Rado Flajs](#), 2012, complete scientific database of research data
Keywords: [extreme shear stresses](#), [method of Lagrangian multipliers](#), [Gnuplot](#), [SAGE](#), [R](#), [Matlab](#), [Mathematica](#)
[Full text](#) (file, 446,46 KB)



Readme file



README file (mandatory)

What is it?

Clear and concise description of all relevant details about data collection, processing, and analysis¹

Why it is needed?

- Help others interpret and reanalyze your dataset
- To document changes to files or file names within a folder
- To explain file naming conventions, practices, etc. "in general" for future reference
- To specifically accompany files/data being deposited in a repository

¹ <https://datamanagement.hms.harvard.edu/collect-analyze/documentation-metadata/readme-files>



README file

Good practices

- Store a **readme.txt/.pdf** (*avoid, i.e., MS Word*) with each distinct dataset* that explains your file naming convention along with any abbreviations or codes you have used.
- Optionally: include additional details about your datasets, such as methodological information or sharing/access information.
- Create a README file at the beginning of your research process, and update it consistently throughout your research (final README file when your data is ready for deposit).

*multiple, related, similarly formatted files, or files that are logically grouped together for use , i.e., a collection of Matlab scripts



README file Examples

Example #1 Recommended README file structure

1. Basic information about the dataset
2. Description of the dataset content
3. Methodology of data collection and processing
4. Format and technical details
5. Rights and licensing
6. Recommended data citation
7. Quality, limitations, and warnings
8. Reproduction instructions
9. Contact

Recommended Structure of a README File

1. Basic information about the dataset:
title of the dataset,
short description (what the research data represent),
purpose of the research or context,
authors/research group,
date of data creation,
links to the project or publications.
2. Description of the dataset content:
list of all folders and files,
brief description of each file (e.g., csv, xlsx, fasta, tiff),
explanation of columns, variables, or attributes,
information on measurement units, encoding, and categories.
3. Methodology of data collection and processing:
description of data collection (instruments, protocols, sources),
temporal and spatial coverage,
measurement conditions or experimental factors,
data processing (filtering, normalization, transformations).
4. Format and technical details:
type of files and required software for their use,
encoding (e.g., UTF-8),
file sizes,
file versions.
5. Rights and licensing:
license (e.g., CC BY 4.0, CC0, Open Data Commons),
usage restrictions,
ethical or legal warnings.
6. Recommended data citation:
standardized citation format,
persistent identifier (PID).
7. Quality, limitations, and warnings:
possible errors or uncertainties,
limitations of validity or use,
warnings for data interpretation.
8. Reproduction instructions:
steps for re-analysis,
links to code or scripts,
information about data versions.
9. Contact:
contact person or organization,
contact email address.



README file Examples

Example #2 Examples from the RUL

Examples from mechanical engineering:

- <https://repozitorij.uni-lj.si/IzpisGradiva.php?id=181332&lang=slv>
- <https://repozitorij.uni-lj.si/IzpisGradiva.php?id=176009>

Examples Readme for undisclosed data:

- <https://repozitorij.uni-lj.si/IzpisGradiva.php?id=178093>

Further reading and practical examples

- [Open Science e-course \(Slovenska skupnost odprte znanosti \(SSOZ\)\)](#)
- [Kozlowski, Wendy. \(2025\) Readme Template for Data. Cornell University eCommons Repository. <https://doi.org/10.7298/mhns-zm71.2>](#)
- <https://datamanagement.hms.harvard.edu/collect-analyze/documentation-metadata/readme-files>



How to Cite the Research data

Most repositories already provide default citation formats for datasets in one or more citation styles.

If a repository that does not offer the citation style you need, you can generate citations using the [Cite This for Me](#) website.

10.9 MB Preview Download

Search for citation ... Search

Rights
License
Creative Commons Attribution 4.0 International

Citation
Aalto University. „Dataset Used for Optimizing HVAC Systems on Cruise Ships“. Zenodo, junij 2025. <https://doi.org/10.5281/zenodo.18682310>.

Style
Chicago

Export
JSON Export

Example: Zenodo provides many citation styles



References

- [Handbook](#) on Research Data Management Planning (Priročnik o načrtovanju ravnanja z raziskovalnimi podatki):

<https://nrrp.odprtaznamost.si/>

- [Free learning platform \(e-course – ENG\)](#)
- [Brezplačne učne vsebine \(e-učilnica – SLO\)](#)
- “**SPOZNAJ project**” - video channel:
<https://video.arnes.si/?channel=9lcqz6j71lg7>



References

- The DiRROS Data website (Central Technical Library @ UNI LJ): <https://dirrosdata.ctlk.uni-lj.si/en/>
- Terminology & glossary: https://terminoloski.slovenscina.eu/iskanje?q=*&d=48;https://www.openaire.eu/rdm-glossary



Who can help me?



Help at your hand?

- @ FME dr. Aleš Gosar, Ales.Gosar@fs.uni-lj.si
- Co-ordinator @ UL: dr. Matej Petrič, Matej.Petric@uni-lj.si
- raziskovalni.podatki@uni-lj.si

Appendix A

DMP for PhD students – DMP form





DMP forms for PhD Students @ UL



ENG version



SLO version



DMP forms for PhD Students @ UL

Data management plan (DMP)

DMP Draft - when submitting your doctoral dissertation proposal

Name of the doctoral student:
Doctoral programme and scientific field:
Proposed title of the doctoral dissertation:
Type of data and methods used for data collection or production
1. What data will be collected or produced?
2. How will new data be collected or produced and/or how will existing data be re-used for the purposes of your doctoral thesis?
3. Will you be dealing with sensitive data? If yes, how will you ensure compliance with ethical requirements when producing and/or creating data?
How data will be stored and protected during research for a doctoral thesis
1. How will data be stored?
2. If you will be dealing with sensitive data, how will you keep it safe and secure? (Move to the next question if not applicable)
Long-term data availability and storage
1. In which data repository will you store the data for the long term after the completion of the research work and make it accessible in accordance with the requirement of Article 50 of the Regulations on Doctoral Studies of the UL?
2. Do you plan to restrict access to the data for a certain period? If yes, please explain the reasons for this (e.g. for intellectual property or patent protection, or other reasons).

Data management plan (DMP)

DMP - at the presentation of the results of the research or at the submission of the doctoral dissertation

Name of the doctoral student:
Doctoral programme and scientific field:
Title of the doctoral dissertation:
Type of data and methods used if new data was collected or produced
1. What data have you collected and/or produced?
2. How did you collect and/or produce new data and how did you use existing data for your doctoral thesis?
3. Have you been dealing with sensitive data? If yes, how have you ensured compliance with ethical measurements when collecting and/or producing data?
How the data was stored and protected during research for a doctoral thesis
1. How did you store the data?
2. If you have worked with sensitive data, how have you ensured that it was kept safe and secure? (Move to the next question if not applicable)
Long-term data availability and storage
1. In which data repository will you store the data for the long term after the completion of the research work and make it accessible in accordance with the requirement of Article 50 of the Regulations on Doctoral Studies of the UL?
2. Do you plan to restrict access to the data for a certain period? If yes, please explain the reasons (e.g. for intellectual property or patent protection, or other reasons).



Further explanations

Type of data and methods used for data collection or production

We have noticed difficulties to distinguish between the first and second questions in this section.

1. What data will be collected and/or produced?

Answers should be **brief and precise**.

If you are working with several different types of data (collected and/or produced), you could provide a table that include:

- **Data type** (qualitative/quantitative, text files, tables, images, geospatial data, etc.)
- **Data format** (as open/non-proprietary as possible, discipline-specific)

If you develop a model, you could add this information here



2. How will new data be collected or produced and/or how will existing data be re-used for the purposes of your doctoral thesis?

Provide a **specific description of the method** of collecting/obtaining/creating data related to the research field.

The **methodology of the research must be evident** from the response.

When **collaborating with an external entity**, you should indicate whether an **agreement/contract on the use of data** will be signed, which will provide for open access to data via a repository as far as possible.

Indicate if you will be working with **proprietary data belonging to third parties** for which you will not be able to ensure open access via the repository.



3. Will you be dealing with sensitive data? If yes, how will you ensure compliance with ethical requirements when producing and/or creating data?

Indicate whether the **ethics committee** has given its **consent to the research and to the Informed Consent Form**.

Please explain whether you will **anonymize/pseudonymize (!data triangulation)** the data for the open access via the repository.

- **Sensitive data** is data that must be protected from unwanted disclosure for legal or ethical reasons, e.g., personal data, data on archaeological and other sites. ([Slovar odprte znanosti](#)).
- For research involving work with people, **you must obtain the consent of the Ethics Committee**, which, *according to Article 36 of the Rules on Doctoral Studies at the University of Ljubljana*, **is an appendix to the application** when submitting the dissertation proposal.
- The Ethics Committee also approves the **informed consent** form with information regarding the availability of data via the repository after the end of the research. [Example from the KERL UL informed consent template](#):

... In accordance with the principles and guidelines of Open Science, raw data may also be published in public repositories, whereby we will ensure that the data cannot be connected to individuals in any way. Your identity will never be disclosed.



How data will be stored and protected during research for a doctoral thesis

1. How will data be stored?

During the research, data must be stored securely, especially if it is sensitive.

Indicate how you will ensure **regular data backups**.

It is recommended to follow the **3-2-1 rule** (3 copies on 2 different media, 1 of which is stored in a different location).

Practical advice: Consult with supervisor, develop a protocol and if available, store the data on institutional secure servers.



2. If you will be dealing with sensitive data, how will you keep it safe and secure? (Move to the next question if not applicable)

It is recommended to protect sensitive data with a **strong password** and **encrypt** the data if necessary.

You should indicate **how you will back up sensitive data**.

We recommend **restricting access** to such data as much as possible.

Indicate **whether and when sensitive data will be destroyed** (e.g., audio recordings of interviews, which will be used to create a transcript that will then be anonymized).



Long-term data availability and storage

1. In which data repository will you store the data for the long term after the completion of the research work and make it accessible in accordance with the requirement of Article 50. of the Regulations on Doctoral Studies of the UL?

You should specify in which **specific repository** the data will be stored and made openly accessible.

According to Article 50 of the Rules on Doctoral Studies at the University of Ljubljana, students must submit their data to a data repository, data center, or research data archive.

Research data shall be preferably submitted to **domain-specific national or international data centers** dedicated to specific types of data, or to the **Repository of the University of Ljubljana (RUL)**.

Search for other repositories: re3data.org in FAIRsharing.org.

Note: For RUL – a detailed readme file is obligatory



2. Do you plan to restrict access to the data for a certain period? If yes, please explain the reasons for this (e.g. for intellectual property or patent protection, or other reasons).

At the beginning of the research check which access options the selected repository offers when choosing a repository. These may include:

- open access **without restrictions**
- **restricted access** (e.g., embargo, upon prior request, only in a secure room, etc.)
- **inaccessible**

Justified exceptions to data sharing (*Article 50 of the Rules on Doctoral Studies at the University of Ljubljana*):

- **personal and sensitive**
- **data protection of intellectual property**
- **non-disclosure of endangered areas, groups, or species**

THE DECREE ON OPEN SCIENCE: exceptions also include **national security** and other legal restrictions.

In this case, at least **freely accessible metadata** must be prepared and published indicating where and under what conditions the research data is accessible.



DMP for PhD Students @ UL

Event for UL doctoral student supervisors on preparing a research DMP, 23 October 2025

[Presentation \(SLO\)](#)



[Recording \(SLO\)](#)



Appendix B

DMP for PhD students – DMP annotated form

(currently in Slovene version only)



Financira
Evropska unija
NextGenerationEU



NAČRT ZA
OKREVANJE
IN ODORNOST



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA VISOKO ŠOLSTVO
ZNANOST IN INOVACIJE



Faculty of
Mechanical Engineering



PODPORA PRI UVAJANJU NAČEL ODPRTE ZNANOSTI V SLOVENIJI



Osnutek NRRP - ob prijavi dispozicije doktorske disertacije

0.1 Ime in priimek doktoranda/doktorandke: 0.2 Doktorski program in področje: Strojništvo (opcija smer-> glej prilogo) 0.3 Predlagani naslov doktorske disertacije:	
1. Tip podatkov in metode njihovega zbiranja in/ali ustvarjanja 1.1 Katere podatke boste zbirali oziroma pridobivali in/ali ustvarjali? <i>Odgovori naj bodo kratki in natančni. Če boste delali z več različnimi vrstami podatkov, kot odgovor navedite tabelo s pregledom:</i> • vrst podatkov (besedilne datoteke, tabele, geoprostorski podatki ...), • datotečnih formatov (ki naj bodo čim bolj odprti/nelastniški). Če NE: Raziskovalni podatki v doktorski raziskavi ne bodo zbrani, pridobljeni ali ustvarjeni. Raziskava bo v celoti izvedena teoretično. Če DA: Vrste podatkov, ki bodo pridobljene, bodo vključevale, vendar niso omejene na, numerične podatke in tabele (npr. rezultate meritev na [stroju, merilnem zaznavalu,...), slikovne datoteke (npr. slike zajete z digitalnim mikroskopom,), video posnetke (npr. posnetki s hitrotekočo kamero) Stevilčni in besedilni podatki ustvarjeni v okviru projekta bodo shranjeni v formatih .csv/.txt (meritve sil in pospeškov...), .txt (navodila za uporabo...) in .ccp/.txt (programska koda), .mp4 (video posnetki eksperimenta za validacijo numerične analize)... Ne pričakujemo težav z združljivostjo med formati, vendar bomo po potrebi sprejeli ustrezne ukrepe. <i>V kolikor boste imeli več različnih vrst podatkov, lahko informacije vpišete v obliki tabele (glej primer priložene tabele). V primeru uporabe obstoječih podatkov iz repozitorijev lahko navedete svojo tabelo (glej primer priložene tabele).</i>	1.2 Na kakšen način boste zbirali oziroma pridobivali in/ali ustvarjali nove podatke in kako boste uporabljali že obstoječe podatke za potrebe vaše disertacije? <i>Podajte podroben opis načina zbiranja/pridobivanja/ustvarjanja podatkov, vezan na raziskovalno področje, pri čemer mora biti iz odgovora razvidna metodologija raziskave. Ne ponavljajte vsebin, ki so že opisane v 1.1.</i> <i>Pri sodelovanju z zunanjim subjektom (podjetjem, inštitutom itd.) navedite, ali bo sklenjen sporazum/pogodba o uporabi podatkov, ki bo predvidel kolikor je mogoče odprt dostop do podatkov prek repozitorija.</i> <i>Navedite, ali boste delali z lastniškimi podatki tretjih oseb, za katere ne boste mogli zagotoviti odprtega dostopa prek repozitorija.</i> Če DA: V okviru doktorske raziskave bomo preučevali (»Kratek opis metodologije«).



Slike metalografsko pripravljениh prereзов ploščatih preizkušancev za določevanje natezne trdnosti gradiва bomo v surovem .raw formatu pridobili z digitalnim mikroskopom Leica DVM 6 in jih nato s programsko opremo Leica LAS X pretvorili v .tif. format.

Če **PROGRAMSKA KODA**: Programsko kodo za izračun dobe trajanja po korakih razvite metodologije bomo napisali in ustrezno komentirali v programskem paketu Microsoft Visual Studio 2026, v programskem jeziku c++ (če ne bo objave na GitHub lahko poleg izvorne .cpp datoteke, kjer bo to možoče, programsko kodo prepišete v .txt format za objavo na splošnem repozitoriju in jo dopolnite z obsežnejšo Readme datoteko (struktura, spremenljivke, standardi...)). ...

Če **NE UPORABA OBSTOJEČIH PODATKOV**: Obstoječih raziskovalnih podatkov v doktorski raziskavi ne bomo uporabili.

Če **DA UPORABA OBSTOJEČIH PODATKOV**: V doktorski raziskavi bomo uporabili tudi obstoječe baze raziskovalnih podatkov. (Primer:

- Vhodni podatki za numerično validacijo modela : Meritve impedanc (Zenodo; DOI 10.5281/zenodo.10794583),

- ...)

1.3 Če boste delali z občutljivimi podatki, navedite, kako boste z njimi ravnali na način, ki je skladen z etičnimi standardi in zakonodajo.

Občutljivi podatki so podatki, ki jih je treba zaščititi pred nezaželenim razkritjem zaradi pravnih ali etičnih razlogov, npr. osebni podatki, podatki o arheoloških in drugih najdiščih ([Slovar odprte znanosti](#)).

Če **imate pridobiti soglasje ustrezne etične komisije, je slednje po 36. čl. Pravilnika o doktorskem študiju UL priloga vloge ob oddaji dispozicije v 2. letniku.**

V odgovoru na to vprašanje navedite, ali je bilo soglasje etične komisije potrebno in ali ste ga pridobili. Prav tako navedite, ali boste za delo z ljudmi uporabili obrazec informiranega soglasja, ki mora biti pripravljen na ustrezen način, ki bo omogočal dostopnost do raziskovalnih podatkov prek repozitorija.

Navedite, ali boste podatke anonimizirali/psevdonimizirali in kaj se bo v tem primeru zgodilo z neanonimiziranimi podatki.

Razmislite:

- Ali bodo tekom raziskav zbrani osebni podatki (npr. Ime, priimek, zaposlitev, izobrazba, naslov, el. pošta, osebna identifikacijska številka ali druga državna identifikacijska številka, datum rojstva, kontaktni podatki, spletni identifikatorji, ljudje na slikah ali video posnetkih, glas na zvočnih posnetkih, podatki o lokaciji, podatki o ozadiju, ki se v kombinaciji lahko uporabijo za identifikacijo posameznika, drugi osebni podatki ... sem spadajo vsi podatki, na podlagi katerih je možno identificirati posameznika)?



- Ali bodo podatki vsebovali druge občutljive informacije (državna skrivnost, lokacije zaščitenih rastlinskih in živalskih vrst)? - Urejanje avtorskih pravic sodelujočih v raziskavi (občanska znanost – npr. fotografije) Ce NE: V raziskavi ne bomo delali z občutljivimi podatki. Ce DA: V okviru raziskave bomo pri izvedbi preizkusov na bioloških vzorcih .../ za potrditev hipoteze uporabljali RTG slike / .../ izvedli intervjuje uporabili obrazce za soglasje k sodelovanju v raziskavi, ki vsebujejo tudi opis postopkov za varstvo osebnih podatkov in pridobili soglasje pristojne etične komisije. V primeru etičnih vprašanj se bomo obrnili na etično komisijo Univerze v Ljubljani.	2. Način hranjenja in zaščita podatkov med raziskav 2.1 Na kakšen način boste hranili podatke? Izmenjava podatkov s projektnimi partnerji: <i>Predhodno razmislite in se dogovorite, kako bo potekala izmenjava podatkov med projektnimi partnerji. Nekaj možnosti:</i> • Namenski (ali obstoječi) MS Team / SharePoint za projekte z ustrezno definiranimi dostopi • Uporaba ARNESovih storitev (npr. FileSender https://podpora.arnes.si/filesender/) • Uporaba plačljivih storitev (npr. WeTransfer) • Google Drive (manj priporočljivo) • Uporaba brezplačnih storitev https://fail-dom.org/, https://github.com/, https://zenodo.org/, ki ponujajo prilagojen omejen dostop Med raziskavo morajo biti podatki, sploh če gre za občutljive podatke, varno hranjeni. Navedite, kako boste poskrbeli za redno varnostno kopiranje podatkov. Priporoča se sledenje pravilu 3-2-1 (3 kopije na 2 različnih nosilcih, od katerih je 1 hranjen na drugi lokaciji), s čimer se zmanjša tveganje izgube podatkov. Ustvarjeni in pridobljeni podatki bodo med izvajanjem doktorske raziskave (in še vsaj pet let po izteku) shranjeni v varnih oblaknih storitvah, ki jih je odobrila Univerza v Ljubljani (npr. Microsoft OneDrive¹, Teams in SharePoint). Takšne storitve zagotavljajo tudi neprekinjen in avtomatiziran postopek varnostnega kopiranja. Poleg tega bodo raziskovalni podatki shranjeni lokalno na trdem disku službenega osebnega računalnika in kot kopija tudi na prenosnem trdem disku/podatkovnem oddelčnem strežniku. Dostop do podatkov bo omejen in nadzorovan preko upravljanja z dovoljenji v nastavitvah. Imeli ga bodo le pooblašeni člani raziskovalne ekipe (npr. mentor_ica in somentor_ica...)
2.2 Če boste delali z občutljivimi podatki, kako boste skrbeli za njihovo varovanje in zaščito? (v nasprotnem primeru to vprašanje preskočite)	

¹ Podatki se po končanju dr. študija/zaposlitve avtomatično brišejo- razmislite o deljenem dostopu z mentorjem



Priporočamo, da občutljive podatke zaščitite z močnim geslom, po potrebi poskrbite za njihovo enkripcijo in čim bolj omejite dostop do njih.

V odgovoru tudi navedite, ali in kdaj bodo občutljivi podatki uničeni (npr. zvočni posnetki intervjuja, na podlagi katerih bo ustvarjena transkripcija, ki bo nato anonimizirana).

Ce DA: Glavna tveganja, povezana z ravnanjem s podatki, bodo med in po raziskavi zmanjšana s tehničnimi in organizacijski ukrepi za zaščito podatkov med prenosom in shranjevanjem, kot so:

- varno shranjevanje, ki vključuje varovanje z gesli za nadzor dostopa do podatkov (upravljanja z dovoljenji v nastavitvah) ali fizično omejeni dostopi,
- uporabo varne šifrirane povezave med napravo za shranjevanje podatkov in internetom (VPN),
- upoštevanje splošne uredbe o varstvu osebnih podatkov (GDPR), dodelitev vloge obdelovalca/upravljalca podatkov,
- upoštevanjem ustaljenih etičnih in pravnih standardov (etični kodeks Univerze v Ljubljani, evropski kodeks ravnanja za raziskovalno integriteto, smernice etičnega ravnanja pri raziskovalnem delu z ljudmi, zakon o varstvu osebnih podatkov (ZVOP-2), direktiva 2010/63/EU o zaščiti živali, ki se uporabljajo v znanstvene namene, priporočila UL pri uporabi umetne inteligence, idr.),
- določitev ocene učinkov v zvezi z varstvom osebnih podatkov.

Za najbolj občutljive podatke pa tudi z enkripcijo, postopki anonimizacije (napišite katere metode, npr. APX, SDV, SynDiffix ipd.) ali psevdoanonimizacije (uporaba identifikatorjev in psevdonimov).

3. Dolgotrajna dostopnost in hranjenje podatkov
- 3.1 V katerem (podatkovnem) repozitoriju boste raziskovalne podatke objavili in dolgoročno hranili po zaključku raziskovalnega dela v skladu s 50. členom Pravilnika o doktorskem študiju UL?
- Navedite repozitorij, v katerem bodo podatki shranjeni in odprtodostopni.
Po 50. čl. Pravilnika o doktorskem študiju UL mora študent podatke prednostno objaviti v nacionalnem ali mednarodnem področnem repozitoriju, namenjenem določenim vrstam podatkov, ali v Repozitoriju UL. Primere področne repozitorije lahko poiščete v razvidih re3data.org in FAIRsharing.org.
- Navedite, kateri podatki, ki ste jih navedli pri vprašanju 1.1, bodo shranjeni v repozitoriju in v katerem formatu (surovi in/ali obdelani; priporoča se izbira čim bolj odprtih/helastniških formatov).
- Podatki bodo shranjeni v splošnem repozitoriju npr. RUL (<https://repozitorij.uni-lj.si/info/index.php/slo/>), Zenodo (<https://zenodo.org/>) ipd. (zapišite predvidoma v katerem in si preberite pogoje repozitorija), ki omogoča trajno hrambo in izvajanje digitalnega skrbništva.
- Opomba: platforma GitHub za objano programske kode (<https://qithub.com/>) ne izda PID, zato je povezava v drug repozitorij (npr. Zenodo), ki izda PID, nujna.



Priporoča se hramba za obdobje vsaj 5 let (priporočeno 10 let).

Seznam zaupanja vrednih repozitorijev, ki jih objavlja ARIS, Sezname repozitorije: re3data.org and FAIRsharing.org.

3.2 Če načrtujete omejiti dostop do podatkov za določen čas, navedite razloge.

Upravičene izjeme pri deljenju podatkov so po 50. čl. Pravilnika o doktorskem študiju UL:

- osebni in občutljivi podatki,
- varovanje intelektualne lastnine,
- nerazkrivanje ogroženih področij, skupin ali vrst.

V primeru omejenega dostopa morajo biti odprtodostopni vsaj metapodatki, iz katerih je razvidno, kje in pod katerimi pogoji so raziskovalni podatki dostopni.

Če NE: Ne načrtujemo omejitve dostopa do podatkov.

Če DA: Navedite razloge, zakaj podatki v celoti ali deloma ne bodo v odprtem dostopu oz. zakaj bo dostop do podatkov omejen. Pri tem ločite pravne in pogodbene razloge (varstvo intelektualne lastnine, varstvo osebnih podatkov, varnost oseb ali države ali druge zakonske omejitve) od drugih omejitev. Navedite, kateri ukrepi bodo sprejeti za odpravo ali zmanjšanje teh omejitev (spletni dostop na zahtevo, varna soba, objava samo metapodatkov (izbor repozitorija, ki tovrstne omejitve omogoča!)).

V primeru vprašanj se lahko obrnete na mrežo podatkovnih svetovalcev in kontaktnih oseb za ravnanje z raziskovalnimi podatki na UL (raziskovalni.podatki@uni-lj.si).

Appendix C

DMP for PhD students – DMP supplementary files (currently in Slovene version only)



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NAČRT ZA
OKREVANJE
IN ODPOORNOST



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA VISOKO ŠOLSTVO
ZNANOST IN INOVACIJE



SP@ZNAJ
PODPORA PRI UVAJANJU NAČEL ODPRTE ZNANOSTI V SLOVENIJI



UL FME COURSE information

PODATKI ŠTUDIJSKEGA PROGRAMA STROJNIŠTVO	
Osnovni podatki	
Ime programa	Strojništvo
Lastnosti programa	
Vrsta	doktorski
Stopnja	tretja stopnja
KLASIUS-SRV	Doktorsko izobraževanje(tretja bolonjska stopnja)/doktorat znanosti (tretja bolonjska stopnja) (18202)
ISCED	• tehnika (52)
KLASIUS-P	• Strojništvo (5211)
KLASIUS-P-16	• Metalurgija, strojništvo in kovinarstvo (0715)
Frascati	• Tehniške vede (2)
Raven SOK	Raven SOK 10
Raven EOK	Raven EOK 8
Raven EOVK	Tretja stopnja
Področja/moduli/smeri	• Ni členitve (študijski program) • Energetske, procesne in okoljske inženirske znanosti (smer) • Konstrukcijsko mehanske inženirske znanosti (smer) • Proizvodno inženirske znanosti, kibernetika in mehatronika (smer) • Fakulteta za strojništvo, Aškerčeva 6, 1000 Ljubljana, Slovenija
Clance Univerze v Ljubljani	
Trajanje (leta)	4
Število KT na letnik	60
Načini izvajanja študija	redni



DMP form practical example – Created research data

Ustvarjeni podatki/metoda/eksperiment	Vrsta podatkov/ Data Type	Programska oprema /Software	Tip surovih podatkov /Raw data Format	Tip pridobljen/obdelanih podatkov	Tip podatkov v repozitoriju	Pričakovan a velikost /Expected size	Podatkovni standard/Metadat a format ¹	Repozitorij ² /PID ³
Digitalna mikroskopija	Slika/ Image data	Leica LAS X	.raw	.png / .jpg	.tif	< 5 GB	/	RUL/
	Številčni podatki/ Numerical data	Leica LAS X	.cdat	.csv / .txt	.csv / .txt	< 1 GB	/	
Meritev sile na stroju	Številčni podatki/ Numerical data	MeasureSoftwareX	.xml	.xml	.xml	< 500 GB	(preveri na stroju/software, če je zapisan kak standard v katerem se podaja izpis meritve)	
Zajem s hitrekočo kamero	Slika /Image data	HighspeedCamera Capture v.1.23	.jpeg	.jpeg/.avi	.mp4	< 2 GB	/	

¹ Urejenost podatkov v repozitoriju glede na specifičen metapodatkovni standard oz. format zapisa (urejenost/struktura)

² Seznam zaupanja vrednih repozitorijev: <https://www.aris-rs.si/si/akti/24/inc/Seznam-repozitorijev1.pdf>

³ PID: A Persistent Identifier (PID) is a long-lasting, unique reference to a digital object, person, or organization that ensures continued access and prevents broken links, even if the resource moves (i.e. DOI or ORCID, HANDLE). Applicable when PID is known.

Programska koda	Tekstovni podatki	MS Visual Studio 2026	.ccp	.ccp	.txt	< 100 MB	/	GitHub+Zenodo
...								



DMP form practical example – Reused research data

V raziskavi bomo pridobili in ponovno uporabili obstoječe podatke⁴:

- Meritev sila na konstrukciji #1 pridobljenih iz repozitorija [npr. RUL, Zenodo]. Obseg podatkov, ki jih bomo ponovno uporabili tekom raziskave še ni znan in bo objavljen skladno s potekom raziskave v sledečih verzijah NRRP.
- Meritev ...]
- Meritev ...

Ponovno uporabljeni oz. pridobljeni podatki	Vrsta Data Type	Programska oprema /Software	Tip surovih podatkov Raw data Format	Tip pridobljen/obdelanih podatkov	Tip podatkov v repozitoriju	Pričakovana velikost /Expected size	Podatkovni standard/Metadata format ^{5,6}	Dostop do podatkov
Meritev sila na konstrukciji #1	Številčni podatki/Numerical data	/	.csv	.csv / .txt	.csv / .txt	< 100 MB	/	https://doi.org/10.000/zenodo.18740068232133
...								

⁴ Najverjetneje v verziji v1.0 še ne bo povsem znan obseg podatkov, ki jih boste uporabili tekom raziskave. V tem primeru opišite podatke oz. tip podatkov za katere že veste, da jih boste uporabili in obrazložitev.

⁵ Datotek v repozitoriju

⁶ Urejenost podatkov glede na specifičen metapodatkovni standard oz. format zapisa (urejenost/struktura)

Appendix D

DMP for PhD students – Readme file template



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DMP form practical example – Readme file template



Recommended Structure of a README File

Source: <https://odprtaznanost.si/ucilnice/introduction-to-managing-research-data/> e-course

1. Basic information about the dataset:

title of the dataset,
short description (what the research data represent),
purpose of the research or context,
authors/research group,
date of data creation,
links to the project or publications.

2. Description of the dataset content:

list of all folders and files,
brief description of each file (e.g., csv, xlsx, fasta, tiff),
explanation of columns, variables, or attributes,
information on measurement units, encoding, and categories.

3. Methodology of data collection and processing:

description of data collection (instruments, protocols, sources),
temporal and spatial coverage,
measurement conditions or experimental factors,
data processing (filtering, normalization, transformations).



DMP form practical example – Readme file template

Recommended Structure of a README File based on <https://odprtaznanost.si/ucilnice/introduction-to-managing-research-data/> e-course

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explanation of columns, variables, or attributes,
information on measurement units, encoding, and categories.

3. Methodology of data collection and processing:

description of data collection (instruments, protocols, sources),
temporal and spatial coverage,
measurement conditions or experimental factors,
data processing (filtering, normalization, transformations).

4. Format and technical details:

type of files and required software for their use,
encoding (e.g., UTF-8),
file sizes,
file versions.

5. Rights and licensing:

license (e.g., CC BY 4.0, CC0, Open Data Commons),
usage restrictions,
ethical or legal warnings.

6. Recommended data citation:

standardized citation format,
persistent identifier (PID).

7. Quality, limitations, and warnings:

possible errors or uncertainties,
limitations of validity or use,
warnings for data interpretation.

8. Reproduction instructions:

steps for re-analysis,
links to code or scripts,
information about data versions.

9. Contact:

contact person or organization,
contact email address.

4. Format and technical details:

type of files and required software for their use,
encoding (e.g., UTF-8),
file sizes,
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DMP form practical example – Readme file template

Recommended Structure of a README File based on <https://odprtiznanost.si/ucilnice/introduction-to-managing-research-data/> e-course

1. Basic information about the dataset:

Title of the dataset,
Short description (what the research data represent),
purpose of the research or context,
authority/research group,
date of data creation,
links to the project or publications.

2. Description of the dataset content:

list of all folders and files,
brief description of each file (e.g., csv, xlsx, fasta, tiff),
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3. Methodology of data collection and processing:

description of data collection (instruments, protocols, sources),
temporal and spatial coverage,
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Thank you for your attention!

