

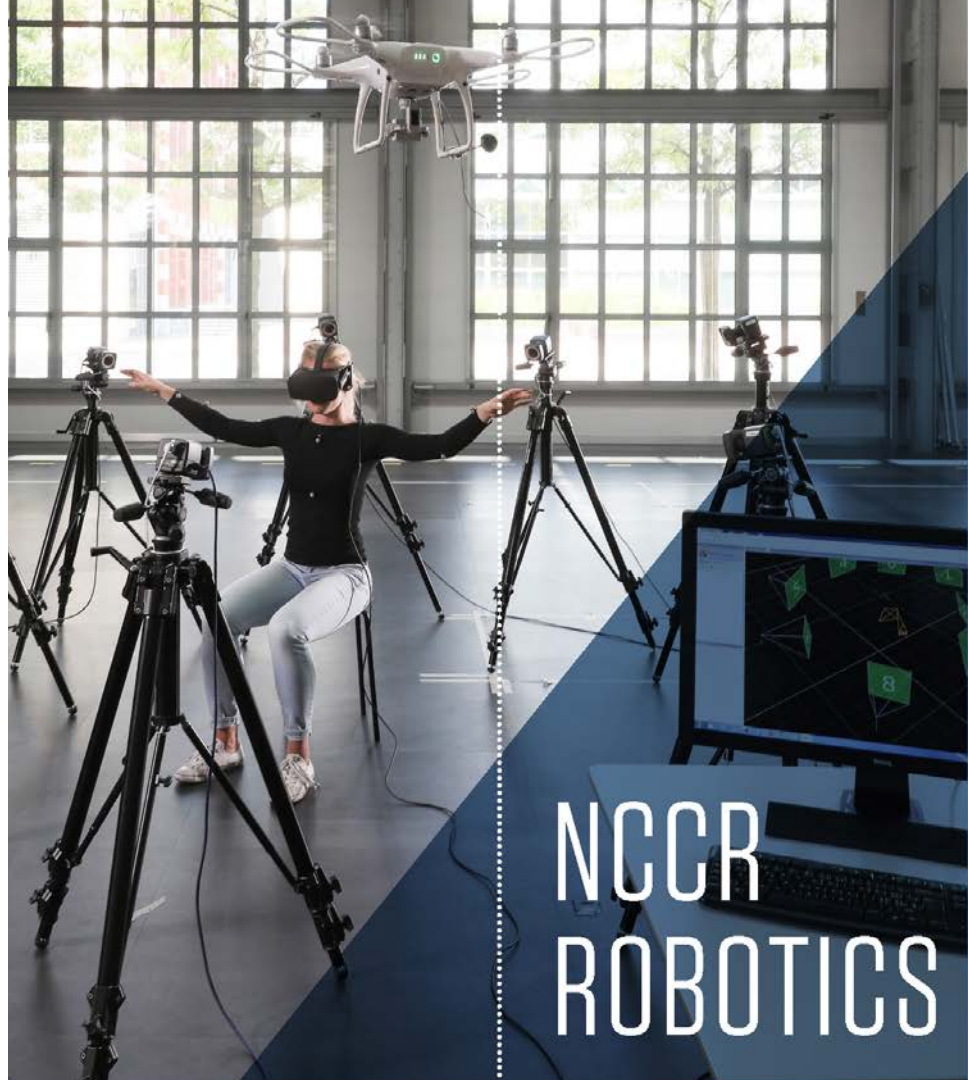
robotics+

Swiss National
Centre of Competence
in Research

NCCR ROBOTICS Research Data Management Strategy: A Workflow Application

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FNSNF
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
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SWISS NATIONAL SCIENCE FOUNDATION



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NCCR ROBOTICS

National Centre of Competence in Research

Developing intelligent robots for improving the quality of life



EPFL

ETH zürich



EPFL



D. Floreano
Flying robots



A. Billard
Humanoids
& learning



G. Courtine
Neuroscience



P. Dillenbourg
Educational
technologies



A. Ijspeert
Legged robots



S. Lacour
Bioelectronics



S. Micera
Neuroprosthetics



F. Mondada
Mobile robots



J. Paik
Reconfigurable



H. Shea
Soft transducers



A. Alahi
Visual intelligence
for transportation



D. Atienza
Embedded
systems



O. Blanke
Cognitive
neuroprosthetics



S. Sakar
Micro-bio-robotics

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R. Riener
Rehabilitation
robots



M. Chli
Robot vision



R. Gassert
Prosthetics
robots



M. Hutter
Legged robots



R. Siegwart
Autonomous
robots



O. Bar-Nur
Regenerative
& movement
biology



S. Coros
Computational
robotics



S. Raspopovic
Neuroprosthetics

USI/SUPSI
Istituto
Dalle Molle
di studi
sull'intelligenza
artificiale
IDSIA



L. Gambardella
Swarm robotics

Empa
Materials Science and Technology



M. Kovac
Flying & soft robotics

u^b
UNIVERSITY
BERN



L. Marchal-Crespo
Robotic assistance

Universität
Zürich



T. Delbruck
Neuromorphic



D. Scaramuzza
Robot vision

University
of Basel



G. Rauter
Biomedical

WHAT WE DO

We are at the forefront of robotics research and develop robots that co-exist symbiotically with humans in order to enable them to help both individuals and society.

We aim at achieving structural impact in robotics through:

- Research
- Education
- Equal Opportunities
- Knowledge and Technology Transfer
- Outreach



WEARABLE
ROBOTICS

RESCUE
ROBOTICS

EDUCATIONAL
ROBOTICS

RESEARCH
GRAND
CHALLENGES



Research Data Management Strategy

Developed in 2019 as part of its contractual obligation.

Synergy with the EPFL Library, and the EPFL Legal and Ethics Departments.

The RDMS aims at contributing to recognize research data as valuable academic resources that need to be managed, shared and preserved to foster research and science.

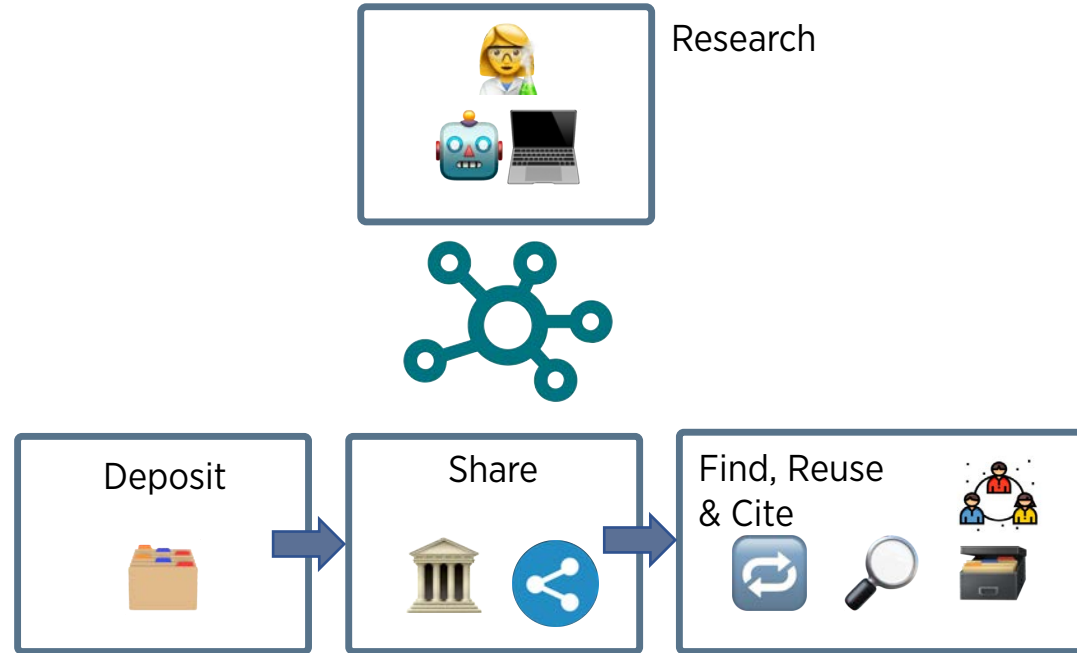
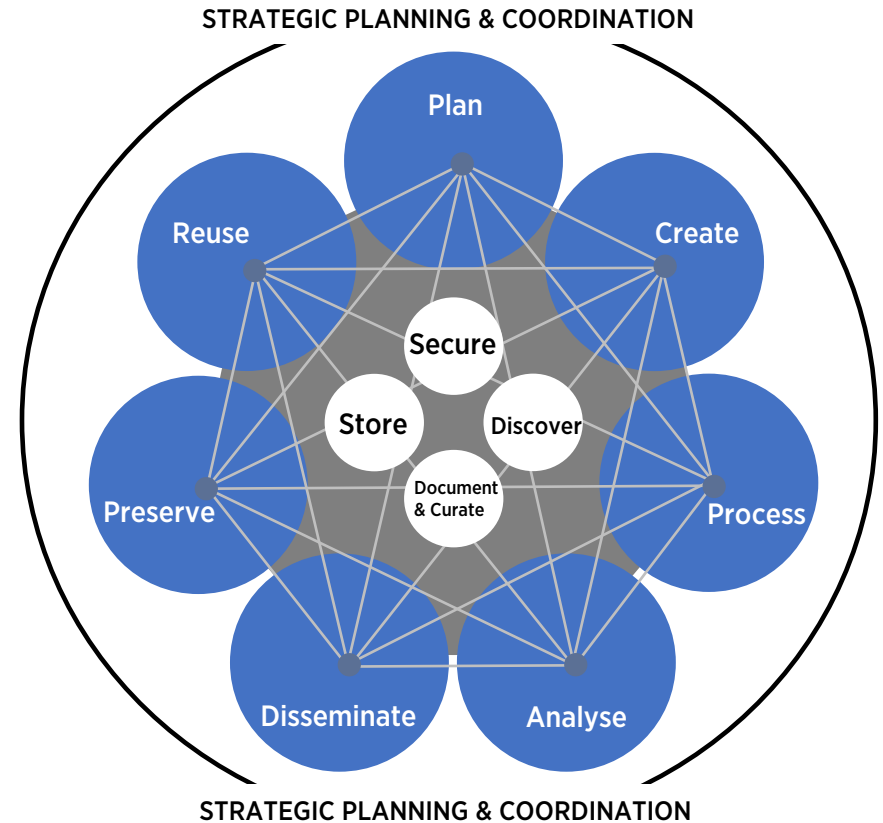


Image source: <https://www.labfolder.com/guide-research-data-management/>

The Research Lifecycle and RDM Functions

Research Data Management (RDM) is the overarching process that guides researchers throughout the different stages of the data lifecycle, enabling scientists and all other involved stakeholders to make the most out of the generated research data.



Data-Related Activities During the Research Process.

Image Source: *Advanced Research Computing (ARC) Position Paper: For Innovation, Science, and Economic Development Canada*. Leadership Council for Digital Infrastructure. Unpublished manuscript. August 31, 2017, 5.)

FAIR principles

outcome of a joint declaration of a diverse set of stakeholders (including SNSF, EC, etc), and they define how research data should be: Findable, Accessible, Interoperable and Reusable.



Data and supplementary materials have sufficiently rich metadata and a unique and persistent identifier.

FINDABLE



Metadata and data are understandable to humans and machines. Data is deposited in a trusted repository.

ACCESSIBLE



Metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation.

INTEROPERABLE



Data and collections have a clear usage licenses and provide accurate information on provenance.

REUSABLE

Image source:

www.libereurope.eu

Ligue des Bibliothèques Européennes de Recherche
Association of European Research Libraries

Why is research data management important for researchers?

- **Plan:** future needs (material, software, HR, ...)
- **Science:** impact, better reproducibility, posterity
- **Data reuse:** better use of public funds
- **Openness:** impact, transparency, accountability
- **Visibility:** citations, collaborations, career
- **Compliance:** law (ex. GDPR), funders (ex. SNSF)
- **Efficiency:** ROI for the lab and beyond
- **Modernity:** world scale digital research, bigdata

EPFL

DOI: [10.5281/zenodo.3327829](https://doi.org/10.5281/zenodo.3327829)



Keeping your research data freely available is crucial for open science - and your funding could depend on it



Getty

Data management made simple

Keeping your research data freely available is crucial for open science — and your funding could depend on it.

[nature.com](https://www.nature.com)

Image source: www.labfolder.com/guide-research-data-management

RDM Strategy



DMP DMP DMP DMP DMP DMP

Information and training activities for NCCR members regarding SNSF/NCCR data management policy and requirements

NCCR Robotics
RDM Officer



Maintenance of the data management infrastructures, data backup and preparation, curation and documentation of datasets, submission of datasets on repositories

NCCR Robotics
Labs





Gr. 1

describes the strategy for researchers handling non-protected and non-sensitive data



Gr. 2

applies for the laboratories that handle sensitive data



Gr. 3

applies for the laboratories that handle protected data

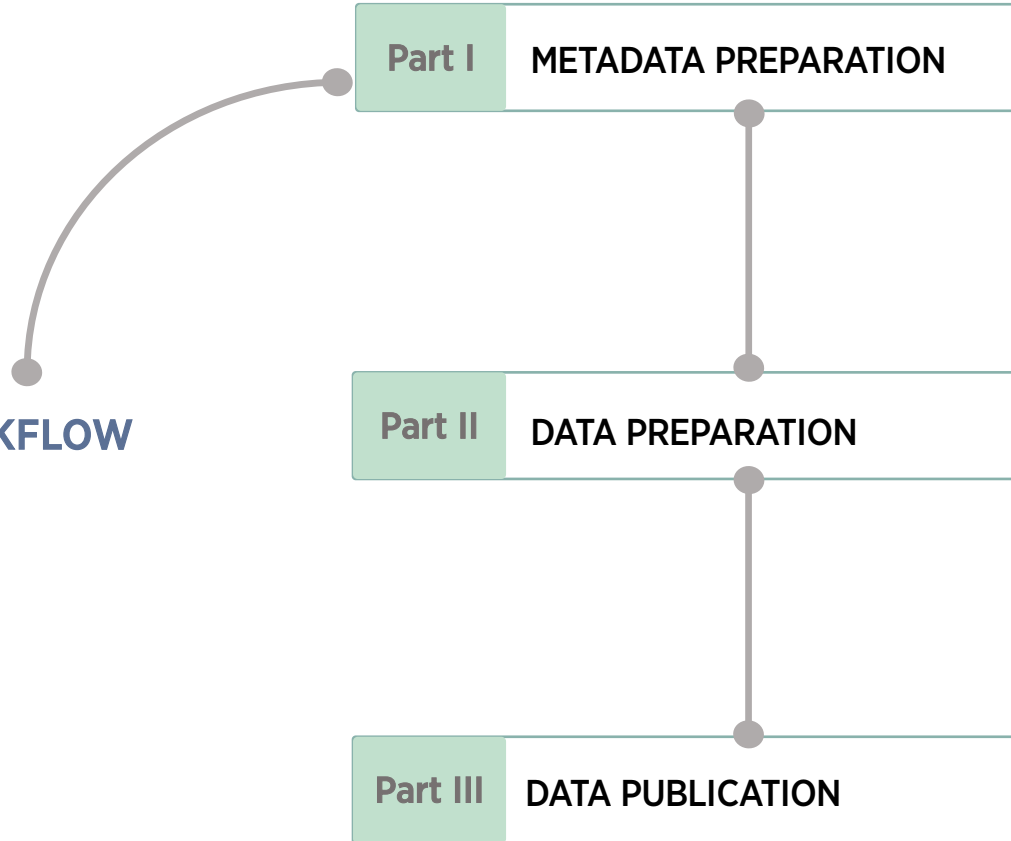


Gr. 4

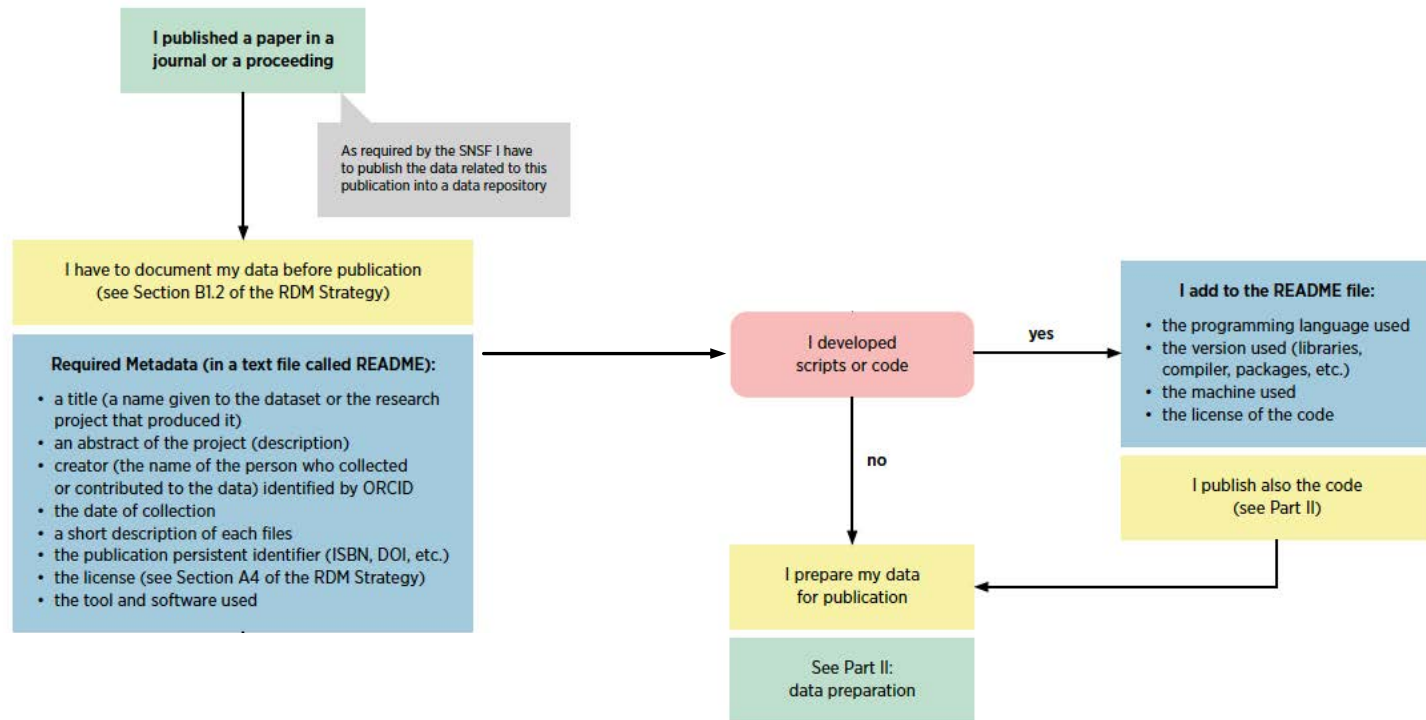
applies for the laboratories that handle both sensitive data and protected data



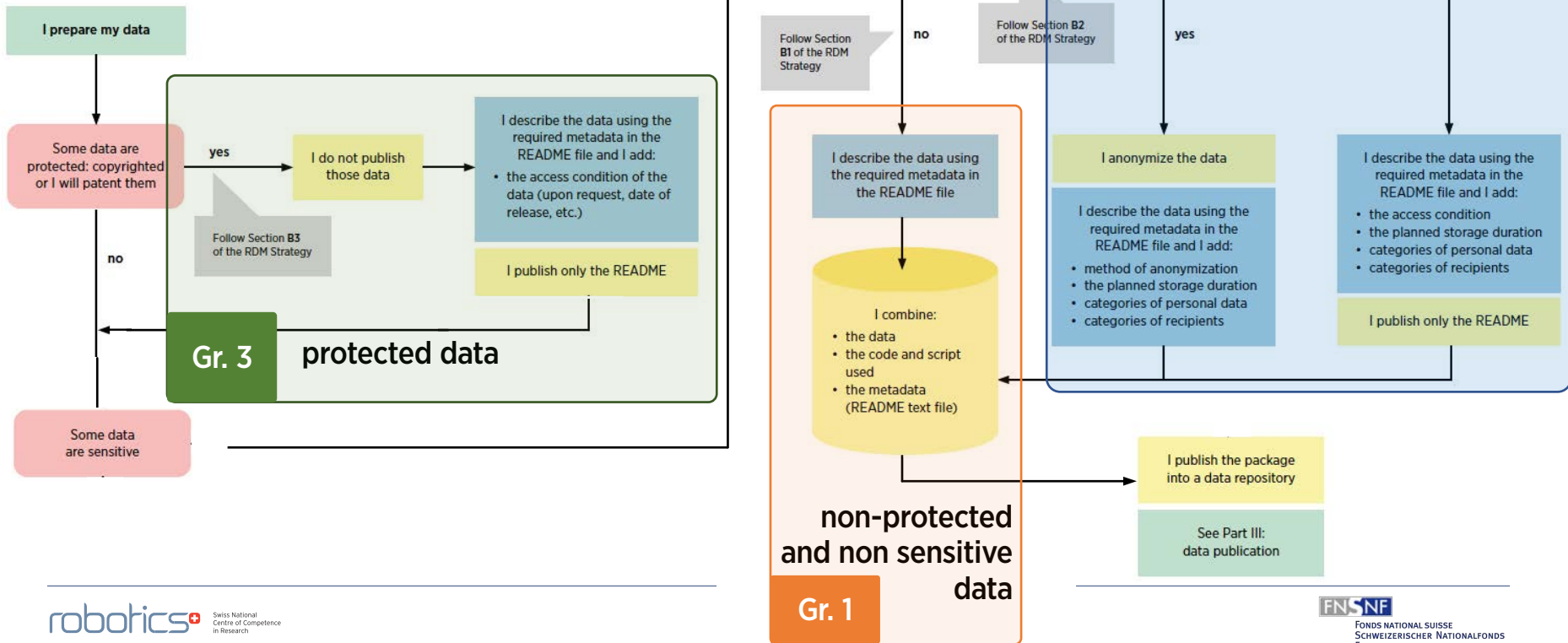
DATA PUBLICATION WORKFLOW

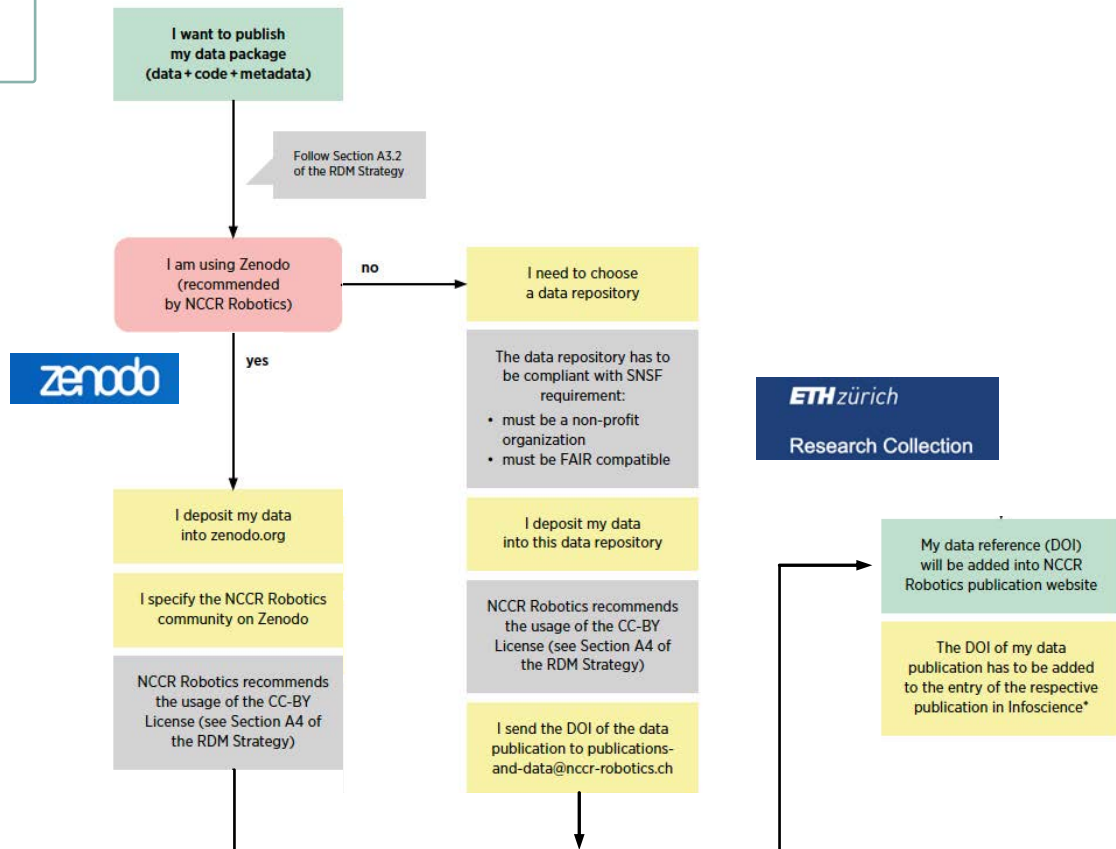


Part I METADATA PREPARATION



Part II DATA PREPARATION





PUBLIC DATA SHARING LOCATION

zenodo Search Upload Communities valeria.dicola@epfl.ch

NCCR Robotics

Recent uploads

Search NCCR Robotics

October 12, 2020 (1) Dataset **Embargoed Access** View

Dataset for the evaluation of a large-scale in-service K-4 teacher-training program for computer science and robotics

Laila El-Hamamsy, Frédérique Chesnel-Lazarotto, Barbara Bruno, Jessica Dethler Zufferey, Francesco Mondada

This dataset contains the quantitative teacher data used to analyse an in service teacher training program that took place from September 2018 to March 2020 in the Canton Vaud in Switzerland. Approximately 350 teachers from the first four grades of primary school (ages 4-8) participated in 4 days of

Uploaded on October 12, 2020

May 30, 2020 (v1.0) Dataset **Open Access** View

Intuitive 3D Control of a Quadrotor in User Proximity with Pointing Gestures (Dataset)

Gromov, Boris, Guzzi, Jérôme, Gambardella, Luca Maria, Giusti, Alessandro

The accompanying dataset and code for the ICRA 2020 publication: B. Gromov, J. Guzzi, L. Gambardella, and A. Giusti, "Intuitive 3D Control of a Quadrotor in User Proximity with Pointing Gestures," in 2020 IEEE International Conference on Robotics and Automation (ICRA), 2020. The dataset

Uploaded on May 30, 2020

January 24, 2020 (v1) **Journal article** **Open Access** View

Customizing Skills for Assistive Robotic Manipulators: An Inverse Reinforcement Learning Approach with Error-Related Potentials

Baltzianoulis, Iason, Iwane, Fumi, Wei, Shupeng, Chavariaga, Ricardo, del R. Millán, José Billard, Aude

Robot and EEG data of the corresponding paper. The scripts for loading and reading the files in Matlab are provided in the folders.

Uploaded on January 24, 2020

June 15, 2019 (v2) **Journal article** **Open Access** View

Publications related to NCCR P1 Regait Ph3

Courtine Gregoire

Publications related to NCCR P1 Regait Ph3

Uploaded on October 14, 2019

1 more version(s) exist for this record

New upload

Community

robotics Swiss National Centre of Competence in Research

NCCR Robotics
NCCR Robotics Zenodo community

Curated by:
valeriadicola

Curation policy:
Datasets submitted by NCCR Robotics members.

Created:
July 5, 2019

Harvesting API:
DOI-PMH interface

Want your upload to appear in this community?

- Click the button above to upload a record directly to this community. To add one of your existing records to the community, edit the record, add this community under the "Communities" section, save, and finally publish.
- The community curator will then be notified to either accept or reject your upload (see community curation policy below).
- If your upload is rejected by the curator, it will still be available on Zenodo, just not in this community.

- **FAIR**
- **Free of charges**
- **Max 50GB/dataset (unlimited datasets)**
- **Automated DOI assignment**
- **GitHub integration**
- **All file formats accepted**
- **Usage statistics interface**

zenodo.org/communities/nccrrobotics/

Additional Information

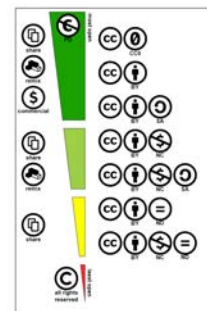
- File formats extensions for reusability/preservation
- Collaborative Storage and File sharing (Switch Drive, Google Drive)
- Adequate data and code licenses

TYPE OF DATA	APPROPRIATE	ACCEPTABLE	DEPRECATED
Tabular (extensive metadata)	CSV – HDF5	TXT – HTML – TEX – FASTQ ⁽¹⁾ – POR	
Tabular (minimal metadata)	CSV – TAB – ODS – SQL – TSV	XML (if appropriate DTD) – XLSX	XLS – XLSB
Textual / Presentation	TXT – PDF – ODT – ODM – TEX – MD – HTM – XML – EXTXYZ ⁽¹⁾ – ODF	PPTX – RTF – DOCX – PDF (with embedded forms) – EPS – IPF	DOC – PPT – DVI – PS
Code / Computation	M – R – PY – IYPHB – RSTUDIO – RMD – NETCDF – AML	SCD	MAT – RDATA
Image & Spectroscopy	TIF – PNG – SVG – JPEG – FITS	JCAMP – JPG – JP2 – TF – TFF – PDF – GF – BMP – DKG – DIR – LSM ⁽¹⁾	IND – AIT – PSD – SPC
Audio	FLAC – WAV – OGG – MXL – MIDI – MEI – HUMDRUM	MP3 – AIF	
Video	MP4 – MJ2 – AVI – MKV	OGM – MP4 – WEBM	WMV – MOV – QT
Geospatial	NETCDF – tabular gis attribute data – SHP – SHX – DBF – PRJ – SBX – SBN – POSTGIS – TIF – TFW – GEOJSON	MDB – MBF	
3D structures & images	X3d – x3dv – x3ob – PDF3D – POV – PDBML	DWG – DXF – PDB	PXP
Generic	XML – JSON – RDF		

DOI: 10.5281/zenodo.3327829

SWITCH

vs.



Apache



NCCR Robotics RDMS implementation in numbers

- Implemented virtually in 2020 during 4 months
- Over **28 Labs** (with 1 hour presentations)
- Taken by more than 100 NCCR Robotics researchers
- Synergy between 3 institutional Libraries



EPFL

ETH zürich

ETH Library



University of Zurich^{uzh}

- Antoine Masson
- Eliane Blumer

Recommendations

1. Share any data that is relevant for re-use.
2. Data underlying publications must be made available at the time of the publication.
3. Wider data can be made available after the project ends.

Diaz, P., Stam, A. (2019). How to draft a DMP from the perspective of the social sciences, using the SNSF template. FORS Guide No. 07, Version 1.0. Lausanne: Swiss Centre of Expertise in the Social Sciences FORS. doi:10.24449/FG-2019-00007

Thank you!!! 😊



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