

### **RESEARCH DATA MANAGEMENT -INTRODUCTION TO FAIR AND OPEN DATA**

Jochen APEL (Heidelberg University) Paola GALIMBERTI (University of Milan) Milan JANÍČEK (Charles University, Prague)

Open for you! An introduction series to open science | 7 March 2022









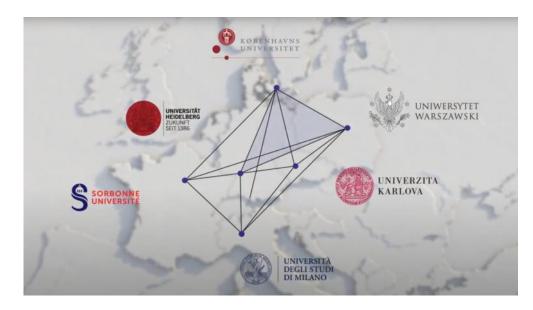






### 4EU+ Alliance and Open Science

- 4EU+ is a transnational strategic university association.
- Aim: Strengthen the European vision of deepened cooperation and mutual enrichment in research and teaching
- Open Science is an integral part of this.
- Two 4EU+ projects currently work on Open Science.
- Open for you an Introduction Series to Open Science" – 14 session on OS topics!





### Agenda

- Introduction
- Why bother with FAIR Data?
- Why bother with Open Data?
- Good practices: a closer look on various data repositories
  - Subject-specific repositories
  - Generic Repositories
  - Institutional Repositories



#### What we will talk about?

"An article [...] in a scientific publication is not the scholarship itself, it is merely advertising of the scholarship." Buckheit, Jonathan B., and David L. Donoho. "WaveLab and Reproducible Research." In *Wavelets and Statistics*, edited by Anestis Antoniadis and Georges Oppenheim, 55–81. Lecture Notes in Statistics. New York, NY: Springer, 1995. <u>https://doi.org/10.1007/978-1-4612-2544-75</u>.



	Publications	
Notes Databases Vic Feedl	Interviews Annotations Methods Bibliographic references VIsualizations Corpora back Experimental data	Images

## The tip of the iceberg



#### What is research data?



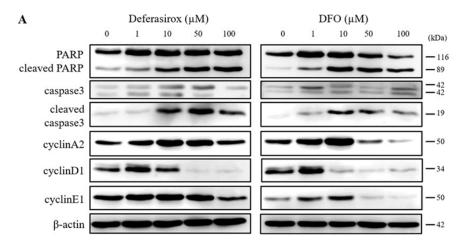
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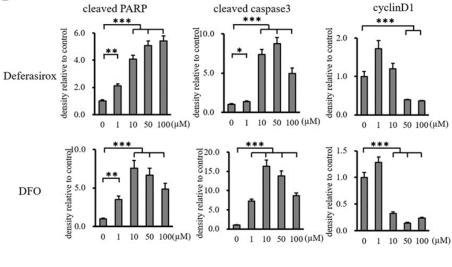
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Is this data?



В





#### Is this data?

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### What is research data?

Any information that has been

collected,

observed,

generated,

created

to validate original research findings

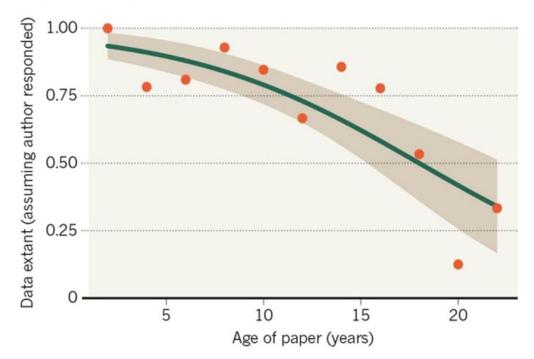
Research data is a very important resource, so we must ensure that it can be reused, first and foremost by ourselves.



#### Data can be missed

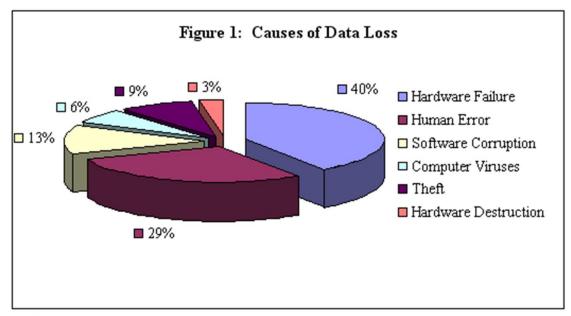
#### **MISSING DATA**

As research articles age, the odds of their raw data being extant drop dramatically.





#### Data can get lost



Source: Author's estimates based on data from Safeware, The Insurance Agency, Inc., "2000 Safeware Loss Study," 2001; and ONTRACK Data International, Inc., "Understanding Data Loss," 2003.



#### Data can be manipulated or altered

Paul Jump, A Star's Collapse.Dutch begin documenting and trying to explain top psychologist's massive fraud. Times Higher Education, November 28, 2011

58 articles published by Diederik Stapel were withdrawn because they were based on invented data. His papers had been published in scientific journals considered prestigious (very high IFs!). Following reports from three doctoral students, the Dutch university for which he worked had started an investigation. Stapel then admitted that he had fabricated the data on numerous occasions. If he had shared his data before, he probably wouldn't have been able to fabricate fakes for so long.

This case led the Netherlands become one of the pioneer countries in Open Science policy and practices



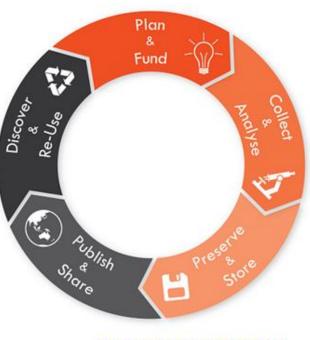
# These problems can be partially solved through responsible research data management



#### **Research Data Management to the resc**

"Research data management concerns the organisation of data, from its entry to the research cycle through to the dissemination and archiving of valuable results. It aims to ensure reliable verification of results, and permits new and innovative research built on existing information."

(Whyte, A., Tedds, J. (2011). <u>'Making the Case for Research Data Management</u>'. DCC Briefing Papers. Edinburgh: Digital Curation Centre.)



https://library.sydney.edu.au/research/datamanagement/research-data-management.html



## The research infrastructure for language as social and cultural data

CLARIN is a digital infrastructure offering data, tools and services to support research based on language resources.

RDM applies to all disciplines including HSS



#### Funders are pushing RDM & Open Data - European level



#### Horizon 2020 & Horizon Europe: FAIR Data Management

- Participating projects will be required to develop a **Data Management Plan** (DMP)
- Participating projects are **required to deposit research data**, preferably into a research data repository
- "[...]as far as possible, projects must then **take measures to enable for third parties to access**, mine, exploit, reproduce and disseminate (free of charge for any user) this research data."

Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 Guidelines on Data Management in Horizon 2020



# Funders are pushing RDM & Open Data - example for a national funder



#### DFG Guidelines on the Handling of Research Data

"[...] Assuming that the publication of research data from a DFG-funded project does not conflict with the rights of third parties (in particular data protection or copyright), **research data should be made available as soon as possible.** 

#### […]

**Applicants may request funding** for project-specific costs that arise in connection with a scientific project, for the preparation of research data for subsequent reuse and/or the transfer of research data to existing infrastructures as part of a proposal to the DFG. [...]"



#### The National Recovery and Resilience Plan



Coerentemente con le finalità del presente Avviso, ai risultati del Programma di ricerca e ai relativi dati (ad esempio, le pubblicazioni di risultati originali della ricerca scientifica, i dati grezzi e i metadati, le fonti, le rappresentazioni digitali grafiche e di immagini e i materiali multimediali scientifici) deve essere garantito un accesso aperto al pubblico nel minor tempo e con il minor numero di limitazioni possibile, secondo i principi "Open science" e "FAIR Data".



#### **Journals: Nature**

An inherent principle of publication is that others should be able to replicate and build upon the authors' published claims. Therefore, a condition of publication in a Nature journal is that authors are required to make materials, data and associated protocols promptly available to readers without undue qualifications.

[...]The preferred way to share large data sets is via public repositories.

http://www.nature.com/authors/policies/availability.html



#### **Journals: PLOS**

#### **Data Availability**

PLOS journals require authors to make all data underlying the findings described in their manuscript fully available without restriction, with rare exception.

#### [...]

Refusal to share data and related metadata and methods in accordance with this policy will be grounds for rejection. [...]

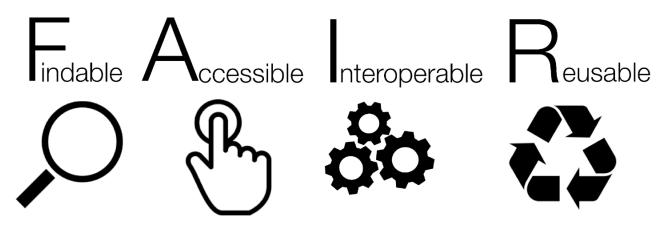
http://www.plosone.org/static/policies.action#sharing







#### **FAIR Data Principles**



- FAIR Data Principles
- Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, Scientific Data 3, <u>doi:10.1038/sdata.2016.18</u>
- SNF: Explanation of the FAIR Data Principles



#### **F** - Findable

others can discover your data

- described using rich metadata
- using persistent identifiers
- indexed in catalogues or databases



### F - Findable

imagine looking for a book in a library

- you can use the catalogue
  - you need the book to be described (metadata)
    - e.g. Nordic crime series; encyclopedia of modern airplanes
- you will find the location
- you will need some kind of very specific (unified) identification "6th floor, shelf 6A/276, HF5718 .22 .F85 2014"

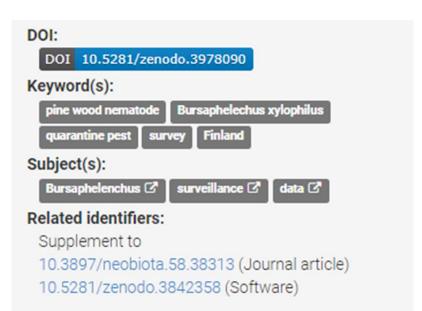


#### **F** - Findable – how to?

in libraries librarians create the description (metadata) for you

in online world, the author has to describe uploaded content himself (!)

repository can help you with identification – assign persistent identifiers (eg. DOI)





#### Metadata

- metadata describe data
  - e.g. title, author, keywords, subject headings, identifiers...
- metadata help other people find your data!
- author of datasets usualy chooses metadata when uploading to repository do not underestimate this!
  - your data can be lost or found... it depends on you!
- libraries can help
  - librarians love metadata ;-)



### **Persistent identifiers (PID)**

- sequence of letters/numbers in specified format, managed by some service provider
- **unique** different things have different identifiers
  - note: name is not unique identifier (e.g. Carl Johansson)
- persistent should work 'forever'
- resolvable there is a way how to get representation of identified object (e.g. links see below)



### **Persistent identifiers (PID)**

- provided by some service
  - DOI digital object identifier 10.5281/zenodo.5665754
    - articles
    - data
  - ORCID Open Researcher and Contributor ID -- 0000-0002-8271-3674
  - ROR.org Research Organization Registry 024d6js02
- note: URL is NOT identifier <u>https://zenodo.org/record/5665755#.Yh6O1-iZOUk</u>
- ...but most PIDs are resolvable (you can use them in URL):
- <u>https://doi.org/10.5281/zenodo.5665754</u>, <u>https://orcid.org/0000-0002-8271-3674</u>, <u>https://ror.org/024d6js02</u>



#### A - Accessible

your data can be made available to others

- using some "simple protocol" e.g. web browser
- or using some more sophisticated way (asking for permission etc.)
- knowing persistent identifier should always help you
  - you should always get at least metadata
- not everything has to be shared without limitations
  - "As open as possible, as closed as necessary."



### A - Accessible – how to?

• publish/share in a

#### repository

• publish at least metadata

Cite	

Download (7.59 MB)

Share Embed + Collect

Dataset posted on 29.07.2020, 11:18 by Petr Čermák, Rudolf Schönmann, Christian Franz, Astrid Schneidewind, Christian Pfleiderer, Oleg Sobolev

#### Abstract:

Recently, time-of-flight neutron spectroscopy in polycrystalline samples of CeCuAl3 has provided putative evidence for a so-called vibronic mode – a combined crystal field - phonon excitation. These types of modes may be responsible for certain forms of magnetically mediated superconductivity or non-Fermi liquid behavior. Our measurement on single-crystal CeAuAl3 performed on the PUMA (p10684, see references) revealed a weakly dispersive excitation at energy 7.9 meV, which is clearly magnetically driven and connected to phonons. However to better understand the nature of this hybridized excitation, more phonon measurements are necessary. Therefore we propose to determine the detailed dispersion of the low lying optical phonons in the energy range between 12-50 meV.

#### Place:

Heinz Meier-Leibnitz Zentrum, Garching, Germany (MLZ)

#### Instruments:

PUMA (https://mlz-garching.de/puma)

#### Date:

Tue, 29. Nov 2016 to Sun, 04. Dec 2016

#### Disclaimer:

Abstract is not modified version of the abstract from original scientific proposal submitted to MLZ. Data are published exactly as they were send to us after the end of experiments (automatic email by NICOS). Authenticity of the data can be verified by the data scientists at MLZ, feel free to contact them.

#### USAGE METRICS

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iews	downloads	citations

#### CATEGORIES

- Condensed Matter Physics
- Electronic and Magnetic Properties of Condensed Matter; Superconductivity



Select an option 💌



### I - Interoperable

other people should be able to use your data (with their own data)

- it should be possible to understand the data
  - format should be readable
  - there should be helpful documentation
  - well known terminology should be used (domain standards)



### I - Interoperable – how to?

- use open formats (plaintext rules!)
- use the right language!

NIH	National Library	of Medicine					
Sear	ch Tree View	MeSH on Demand	MeSH 2021	MeSH Suggestions	About MeSH Browser	Contact Us	

#### 2019-nCoV Vaccine mRNA-1273 MeSH Descriptor

Data 2022





#### Interoperable

- open format is not enough by itself -
  - people should be able to understand your data
- example: temperature
  - **36,6**
  - **36,1**
  - **37,8**
  - 41,5
- what is the context?
  - patient data or hot summer?
- describe your data to make it interoperable (and reusable)!



#### **R** - Reusable

others should be allowed to (confidently) reuse your data

- it should be possible to trust the data
  - provenance
- it should be clear what are is allowed to do with the data
  - licensing conditions



#### **R** - Reusable – how to?

- describe the origin of the data sufficiently
  - how did you get them?
  - how were the data modified/processed?
- use license describing what is possible/legal to do with your data
  - $\circ$  share it freely?

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DO	10.5	281/zenod	lo.466173	37		
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# Why Open Data?

Illustration by Ainsley Seago. From Roche, et. al. *Troubleshooting Public Data Archiving: Suggestions to Increase Participation. PLoS Biology* 12(1): e1001779. https://doi.org/10.1371/journal.pbio.1001779. Licensed

under <u>Creative Commons Attribution 4.0 International License</u>.



#### "Currencies" of science

- Peer-reviewed articles in "high-impact" journals
- Publishing books with well-respected publishers
- Citations of your own work through other authors
- Conference contributions (talks, posters)
- At the end of the day, that's what you get grants, funding, professorships,... for.



The scientific incentive system and the distribution of scientific results

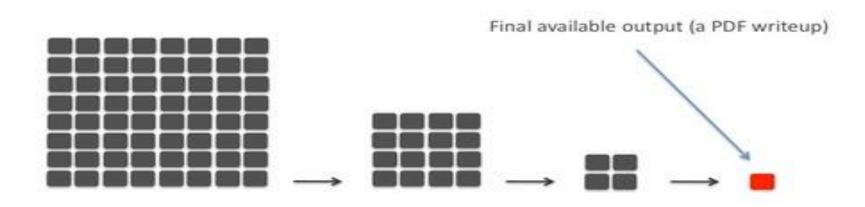
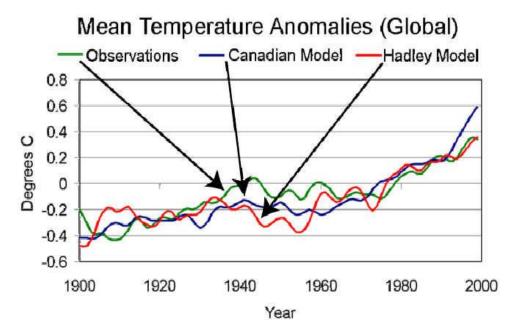


Illustration from http://blog.peerj.com/post/65345738206/changing-the-currency-of-science-to-solve-our-greatest

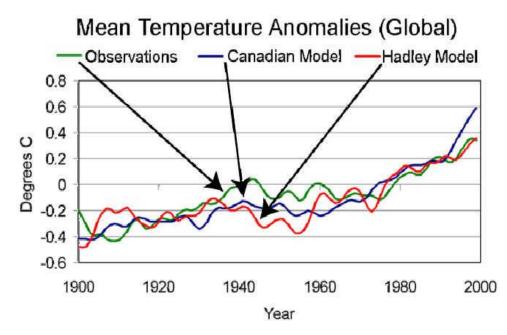


# But open data improve science! Example Climate Science





# But open data improve science! Example Climate Science



## The Telegraph

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Captain Cook's log books help scientists chart climate change

Weather logs kept by Captain James Cook and other 18th and 19th century explorers are being used by scientists to predict the change in climate.



climate change Photo: AP

7:57AM BST 06 Oct 2009

Climate Change News » UK News » Earth News » Environment »

In Climate Change



Bolivia's second largest lake dries up



China's dirty old town



Captain Cook's weather reports from Discovery and Resolution, made at noon each day on his voyages to unknown lands, William Bligh's Bounty



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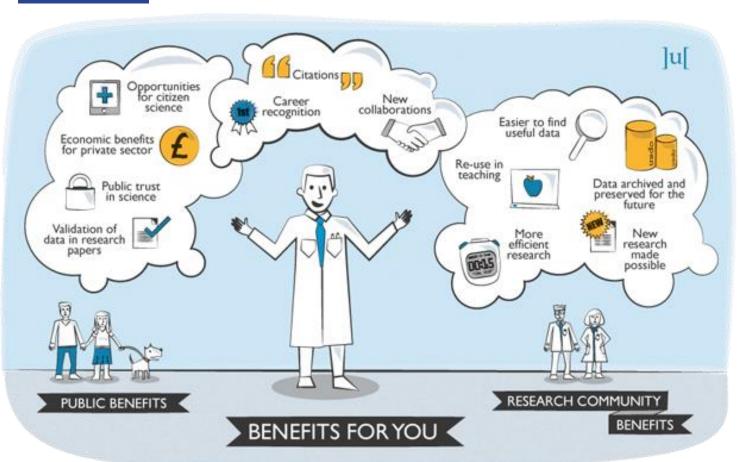
# But open data improve science! Example DNA Sequencing Data

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	Homo sapiens hemoglob:	in, beta (HBB), mRNA.		Highlight Sequence Features	
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KEYWORDS	RefSeq.				
SOURCE	Homo sapiens (human) Homo sapiens				
ORGANISM	Eukaryota; Metazoa; Ch Mammalia; Eutheria; Eu	hordata; Craniata; Vertebrata; Euteleostomi; warchontoglires; Primates; Haplorrhini;		Articles about the HBB gene [IDENTIFICATION OF MUTATION I C) OF THE β-HEMOGLOBIN [Tsite	VS1-5(G >
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REMARK		hat introduction of beta-globin intron in the			
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Human Genome Project: Sequencing and mapping of the human genome, completed 2003

"The success of the genome project is in no small part due to the fact that the world's entire library of published DNA sequences has been an open access public source for the past 20 years. If sequences could be obtained only in the way that traditionally published work can be obtained - there would be no genome project" (Prof. Patrick Brown, Biochemist at Stanford University, 2004)





Picture: Hole, B. (2015). Open Science: <u>A New publisher</u> <u>Perspective</u>. Ubiquity press. (<u>CC BY 4.0 International</u>)



#### What kind of repositories are around for my field of research?





Filter	machine learning	Q Search
Subjects 🗄		Toogle short he
Content Types ⊞		
Countries	← Previous 1 Next →	Sort by -
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API 🕀	Found 4 result(s)	
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Data licenses ⊕	Subject(s)	Communication Science Artificial Intelligence, Image and Language Processing Computer Science Social Sciences
Data upload ⊞	oubject(b)	Social and Behavioural Sciences Humanities and Social Sciences Computer Science, Electrical and System Engineering Engineering Sciences
Data upload restrictions		
Enhanced publication	Content type(s)	Standard office documents Archived data Plain text Databases
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Keywords 🕀		ection of databases, domain theories, and data generators that are used by the machine learning community for the empirical analysis of ents, educators, and researchers all over the world as a primary source of machine learning data sets. As an indication of the impact of
Metadata standards ⊞	the archive, it has been cited over 1000 times.	
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	detailed experimental results with the commun KNIME, RapidMiner and WEKA). Such an easy	arning. By organizing all resources and results online, research becomes more efficient, useful and fun. OpenML is a platform to share ity at large and organize them for future reuse. Moreover, it will be directly integrated in today's most popular data mining tools (for now: R, and free exchange of experiments has tremendous potential to speed up machine learning research, to engender larger, more detailed oners. Finally, it will also be a valuable resource for education in machine learning and data mining.

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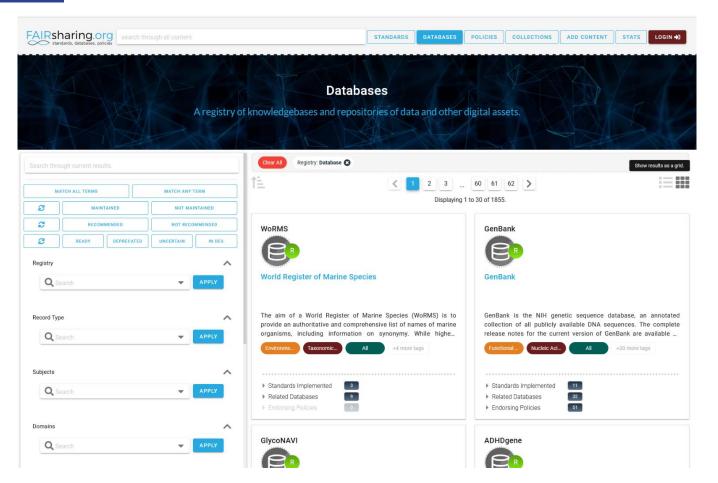
#### Repository details

### **OpenML**



General Ir	stitutions Terms Standards
Name of reposit	ory OpenML
Additional name	(s) Open Machine Learning
Repository URL	http://www.openml.org/
Subject(s)	Education Sciences Computer Science Social and Behavioural Sciences Humanities and Social Sciences
	Computer Science, Electrical and System Engineering Engineering Sciences
Description	OpenML is an open ecosystem for machine learning. By organizing all resources and results online, research becomes more efficient, useful and fun. OpenML is a platform to share detailed experimental results with the community at large and organize them for future reuse. Moreover, it will be directly integrated in today's most popular data mining tools (for now: R, KNIME, RapidMiner and WEKA). Such an easy and free exchange of experiments has tremendous potential to speed up machine learning research, to engender larger, more detailed studies and to offer accurate advice to practitioners. Finally, it will also be a valuable resource for education in machine learning and data mining.
Contact	openmachinelearning@gmail.com
Content type(s)	Standard office documents Structured graphics Plain text Software applications Source code
	Configuration data other Databases
Keyword(s)	machine learning meta-learning experimental methodology datasets algorithms experiments
Repository size	1700000 machine learning experiments on 19630 datasets and 3370 implementations
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A rough typology of data repositories:

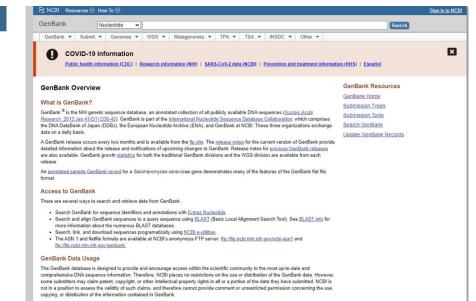
- Controlled access repositories
- Subject- or domainspecific repositories
- Institutional repositories
- Generic repositories



# **Domain repositories**

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https://www.ncbi.nlm.nih.gov/genbank/



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### LINDAT/CLARIAH-CZ

- linguistics / digital humanities repository
- repository + services



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Authors	Zeman, Daniel ; et al. ▶ show everyone	III Statistics
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🔀 Size	29074543 tokens, 29592250 words, 1697879 sentences	About
⊯ Language(s)	Afrikaans , Akkadian , Akuntsu , Albanian , Amharic , AncientGreek (to 1453) , Apurinā , Arabic , Armenian , AssyrianNeo-Aramaic , Bambara , Basque , Beja , Belarusian , Bengali , Bhojpur , Breton , Bulgaran , Catalan , Central Siberian Yupik , Chinese , Chukot , ChurchSlavic , Coptic , Croatian , Czech , Danish , Dutch , English , Erzya , Estonian , Farocse, Finnish , French , Galician , German , Gothic , Guajajára , Hebrew , Hindi , Hungarian , Icelandic , Indonesian , Irish , Italian , Japanese , Javanese , Kicher , Kangri , Karelian , Karo(Brazil) , Kazakh , Khunsari , Komi-Permyak , Komi-Zyrian , Korean , Latin , Lativian , Ligurian , LiteraryChinese , Lithuanian , Livw , LowGerman , Makuráp , Maltese , Manx , Marathi , MbyáGuaraní , Moderm Greek (1453) , Moksha , Mundurukki , Nayini , Neapoltan , Nigerian Pidgin , NorthernKurdish , Northern Sami , Norwegian , OldFrench  (842-ca. 1400) , OldRussian , Old Turkish , SkollSami , Slovak , Slovenian , Soi , South Levanline Arabic , Spanish , Swedish , Swedish , Suedish Sign Language , SwissGerman , Tagalog , Tamil , Tatar , Telugu , Thai , Tupinambá , Turkish , Uighur , Utrajian , UboerSorbian , Urdu , Urubú-Kaapor , Vietnamese , Warlori , Welsh , Western Armenian .	Help Desk

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Description	Universal Dependencies is a project that seeks to develop cross-linguistically consistent treebank annotation for many languages, with the goal of facilitating multilingual parser development, cross-lingual learning, and parsing research from a language typology perspective. The annotation scheme is based on (universal) Stanford dependencies (de Marneffe et al., 2006, 2008, 2014), Google universal part-of-speech tags (Petrov et al., 2012), and the Interset interlingua for morphosyntactic tagsets (Zeman, 2008).
	Version 2.8.1 fixes a bug in 2.8 where a portion of the Dutch Alpino treebank was accidentally omitted.
🖓 Publisher	Universal Dependencies Consortium
Acknowledgement	Ministerstvo školství, mládeže a tělovýchovy České republiky
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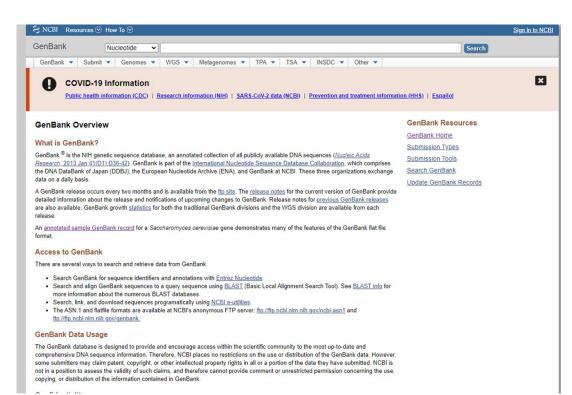
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Authors: Martin Popel, Dušan Variš, Ondřej Košarko Description: A neural networks based translation service provides a simple UI and API that lets you use Transformer models trained by our experts. Five models are currently provided with more to come.	UWebASR	Translate Choose file
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Strake, Milan and Straković, Jana, 2016, UDPipe, LINDATICLARIAH-CZ digital library at the Institute of Formal and Applied Linguistics (UFAL), Faculty of Mathematics and Physics, Charles University, http://hdl.handie.net/1234/1-1702.		Dušku Varis en ⊷ru, en ⇔de models
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LOCUS	SCU49845 5028 bp DNA linear PLN 29-OCT-2018	Highlight Sequence Features
DEFINITION	Saccharomyces cerevisiae TCP1-beta gene, partial cds; and Ax12p	Find in this Sequence
ACCESSION	(AXL2) and Rev7p (REV7) genes, complete cds. U49845	Find in this Sequence
VERSION	U49845.1	
KEYWORDS		Related information
SOURCE ORGANISM	Saccharomyces cerevisiae (baker's yeast) <u>Saccharomyces cerevisiae</u>	Protein
Children 1201	Eukaryota; Fungi; Dikarya; Ascomycota; Saccharomycotina;	PubMed
	Saccharomycetes; Saccharomycetales; Saccharomycetaceae;	Pubmed
REFERENCE	Saccharomyces. 1 (bases 1 to 5028)	Taxonomy
AUTHORS	Roemer,T., Madden,K., Chang,J. and Snyder,M.	Full text in PMC
TITLE	Selection of axial growth sites in yeast requires Ax12p, a novel	PubMed (Weighted)
JOURNAL	plasma membrane glycoprotein Genes Dev. 10 (7), 777-793 (1996)	
PUBMED	<u>8846915</u>	
REFERENCE	2 (bases 1 to 5028)	LinkOut to external resources
AUTHORS TITLE	Roemer,T. Direct Submission	Dryad Digital Repository
JOURNAL	Submitted (22-FEB-1996) Biology, Yale University, New Haven, CT	[Dryad Digital Repository]
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- Saccharomyces cerevisiae EC9-8
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  - Saccharomyces cerevisiae FostersB
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#### Saccharomyces

cerevisiae



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ORIGIN

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Dataverse Research C	attasets (328)         Stochastic dynamics of a few sodium atoms in presence of a cold potassium cloud [data]           les (3,250)         Mar 1, 2022 - Synthetic Quantum Systems (SynQS)           se Category         Bhatt, Rohit Prasad; Kilinc, Jan; Hocker, Lilo; Jendrzejewski, Fred, 2021, "Stochastic dynamics of a few sodium atoms in presence of a cold potassium cloud [data], https://doi.org/10.11588/data/HRCX/P, heiDATA, V2, UIII: 6 Lico/Hold/WCC FetUnd/Later (FetIal INF)			Sort -	Publication Year           2021 (84)           2020 (31)           2022 (26)           2019 (20)           2018 (2)			ew with Dave Jenniss Feb 25, 2022 - Intervi Sacco, Daniela, 202 Interview with Dave J	iews 22, "Interview wi anniss, director	ith Dave Jenniss", r of Ondinnok thea	, https://doi.org/			R, UNIMI Datav	erse, V2		
Organizatio Research F Department		We provide the data and our upyer notebook used to generate the figures of our publication. Abstract: Single particle resolution is a requirement for numerous experimental protocols that emulate the dynamics of small systems in a bath. Here, we accurately resolve through				Author Name		Intervi	ew with Isabelle Payan Feb 25, 2022 - Inteni		Kaseka						

#### https://heidata.uni-heidelberg.de

#### https://dataverse.unimi.it/



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		Hillebrandt, Sabina; Bach, Margund; Kaufmann, R uced chromatin conformation changes , doi:10.115			i Cite Da	itaset 🕶		
Dataverse, V3	turing radiation ind	aced chromatin comormation changes, doi, to, the	Learn about Data Citation Standards.					
Description		protein (YFP) labelled histone H2A, we resolution localization microscopy (Spec radiation of different doses and aliquots	ressing either green fluorescent protein (GFP) labe investigated the positioning of individual histone pr tral Position Determination Microscopy = SPDM). T s were fixed after different repair times for SPDM im positioning of antibodies specific for heterochromal	oteins in cell nuclei l 'he cells were expos aging. In addition to	by means of h sed to ionizing the repair	igh		
		Experimental data was acquired in the E Margund Bach and Rainer Kaufmann.	Experimental Biophysics group by Michael Hausmar	nn, Patr <mark>ick Müller,</mark> Sa	abina Hillebra	ndt,		
			imental data and the maskings of the regions of int f the Statistical Physics and Theoretical Biophysics		KDEs were			
Related Publi	ication		5, Krufczik M, et al. (2015) Radiation Induced Chron , Statistical Physics, and Graph Theory. PLoS ONE			lysed		
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PDM	data capt	uring ra	adiation in	duced chromatin co	nformation changes			
	ta capturing r			bina; Bach, Margund; K <u>aufmanr</u> conformation changes <mark>, doi:10.</mark>	11588/data/10031, neiDATA	E Cite Dataset •		
			prot resc radi dep SPE Expr Mar		romatin Conformation Changes Analysed by Flu Patrick Müller, Sabina Hillebrandt, Matthias Krufczik, Marg Citation: Zhang Y, Máté G, Müller P, Hillebran Radiation Induced Chromatin Conformation Ch Localization Microscopy, Statistical Physics, e0128555. doi:10.1371/journal.pone.0128555	und Bach, Rainer Kaufmann, dt S, Krufczik M, Bach M, et al. (20 anges Analysed by Fluorescent	15)	<b>₽</b> PL
Ker calc		Materials and Methods Results	Academic Editor: Martin Fernandez-Zapico, Schulze Center for Novel Therapeu Mayo Clinic, UNITED STATES		cs,			
			by F 10.1	Discussion Acknowledgments	Received: October 18, 2014; Accepted: April	5		
Dataset Version: 3.0				Author Contributions References	Contributions Copyright: © 2015 Zhang et al. This is an open access article distributed unde			
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# 4**eu**+

Title \varTheta	GECCA mapped
Subtitle 😧	Mapping Western Group Exhibitions of Contemporary Chinese Art after 1979
Author 😌	Franziska Koch (Heidelberg Centre for Transcultural Studies, Global Art History, Heidelberg University, Germany)
Contact 😧	Use email button above to contact.
	Franziska Koch (Heidelberg Centre for Transcultural Studies, Global Art History, Heidelberg University, Germany)
Description	GECCA mapped is a pilot project that visualizes and provides geo-referential metadata of sixty exhibition entries collected in the larger GECCA data base (more than 700 entries). The exhibition sample is limited to Western i.e. Western European and Northerm American group exhibitions, and excludes bi-/ triennials. With the support of the HRA (Heidelberg Research Architecture), GECCA mapped allows the user to trace the exhibition sample implemented in Google Earth. The GECCA mapped logo indicates the place where a particular exhibition was staged and is scaled according to the number of participating artists. A click on the logo opens a pop-up window presenting more information on the exhibition. The Google Earth timeline enables the user to follow the exhibition development in any chosen geographical area in the period from 1982 (earliest exhibition entry) to 2009 (latest exhibition shas played a fundamental role in creating a global context for Chinese art within and outside of the People's Republic after the end of the "Great
	Proletarian Cultural Revolution" (1966-1976) and since of the political reforms initiated by Deng Xiaoping in 1978/79. In economic, discursive, aesthetic and institutional terms, the Western reception of these shows was very influential for the establishment of a certain international canon of artworks, artists and curators. This particular canon in fact came to be considered representative of the whole of Chinese artistic production, although it actually tends to exclude large parts of the overall artistic activity such as "national ink painting" (guohua), conventional or conservative academic oil painting, as well as those works involving political or consumption oriented subject matter, including mass-produced decorative and popular artworks.
	With 60 exhibitions entries, the data that GECCA mapped visualizes is a comparatively small sample of the database GECCA - which contains more than 700 exhibition entries. The data was individually researched and includes information on the location, institution, dates, exhibition topic, participating artists and curators. The sources for the data stem from exhibition catalogues, museum websites, archival documentation of public art libraries and other archives.
	A typical use of the kmz-file that visualizes GECCA mapped is Google Earth.
Subject 😧	Arts and Humanities
Keyword	contemporary Chinese art group exhibitions North America (general region) (TGN) http://vocab.getty.edu/tgn/7029440 Europe (continent) (TGN) http://vocab.getty.edu/tgn/7000093 Australia (nation) (TGN) http://vocab.getty.edu/tgn/7000490 Art, Chinese20th centuryExhibitions (LCSH) http://id.loc.gov/authorities/subjects/sh2007101410 GECCA mapped Geographic information systems (LCSH) http://id.loc.gov/authorities/subjects/sh90001880 Digital mapping (LCSH) http://id.loc.gov/authorities/subjects/sh85037980
Related Publication 😡	Koch, Franziska. 2016. "Die »chinesische Avantgarde« und das Dispositiv der Ausstellung: Konstruktionen chinesischer Gegenwartskunst im Spannungsfeld der Globalisierung". Bielefeld: franscript. isbn: 978-3-8376-2617-9 http://www.transcript- verlag.de/978-3-8376-2617-9/die-chinesische-avantgarde-und-das-dispositiv-der-ausstellung

#### Findability

- DOI's
- Metadata

Chinoso: English

# 4**eu**+

Title 😯	GECCA mapped
Subtitle 😯	Mapping Western Group Exhibitions of Contemporary Chinese Art after 1979
Author 😧	Franziska Koch (Heidelberg Centre for Transcultural Studies, Global Art History, Heidelberg University, Germany)
Contact 😌	Use email button above to contact.
	Franziska Koch (Heidelberg Centre for Transcultural Studies, Global Art History, Heidelberg University, Germany)
Description	GECCA mapped is a pilot project that visualizes and provides geo-referential metadata of sixty exhibition entries collected in the larger GECCA data base (more than 700 entries). The exhibition sample is limited to Western, i.e. Western European and Northern American group exhibitions, and excludes bi-/ triennials. With the support of the HRA (Heidelberg Research Architecture), GECCA mapped allows the user to trace the exhibition sample implemented in Google Earth. The GECCA mapped logo indicates the place

where a particular exhibition was staged and is scaled according to the number of participating artists. A click on the logo opens a pop-up window presenting more information on the exhibition. The Google Earth timeline enables the user to follow the exhibition development in any chosen geographical area in the period from 1982 (earliest exhibition entry) to 2009 (latest exhibition entry). Group Exhibitions of Contemporary Chinese Art (GECCA): The medium of (group and panoramic) exhibitions has played a

fundamental role in creating a global context for Chinese art within and outside of the People's Republic after the end of the "Great Proletarian Cultural Revolution" (1966-1976) and since the political reforms initiated by Deng Xiaoping in 1978/79. In economic, discursive, aesthetic and institutional terms, the Western reception of these shows was very influential for the establishment of a

certain international canon of artworks, artists and curators. This parti the whole of Chinese artistic production, a "national ink painting" (guohua), convention consumption oriented subject matter, incl

Chinoco: English

DOI's -

Findability

Metadata -

the whole of Chinese artistic production, although it actually tends to e "national ink painting" (guohua), conventional or conservative academ	Life Sciences Metadata 🔨					
consumption oriented subject matter, including mass-produced decore	Design Type 🚱	Not Specified				
With 60 exhibitions entries, the data that GECCA mapped visualizes is which contains more than 700 exhibition entries. The data was individu	Factor Type \varTheta	Cell Type/Cell Line; Developmental Stage; Organism				
institution, dates, exhibition topic, participating artists and curators. Th	Organism 😧	Homo sapiens; Mus musculus				
museum websites, archival documentation of public art libraries and o	Other Organism 🚱	Monodelphis domestica				
A typical use of the kmz-file that visualizes GECCA mapped is Google	Measurement Type 🚱	transcription profiling				
Arts and Humanities	Technology Type 😣	nucleotide sequencing				
contemporary Chinese art	Other Technology Type 😣	single nucleus RNA-seq				
group exhibitions North America (general region) (TGN) http://vocab.getty.edu/tgn/7029	Technology Platform 🚱	Illumina				
Europe (continent) (TGN) http://vocab.getty.edu/tgn/1000003 Australia (nation) (TGN) http://vocab.getty.edu/tgn/7000490	Other Technology Platform \varTheta	10x Chromium 3' protocol				
Art, Chinese–20th century–Exhibitions (LCSH) http://id.ioc.gov/author GECCA mapped Geographic information systems (LCSH) http://id.ioc.gov/authorities/subje Digital mapping (LCSH) http://id.ioc.gov/authorities/subjects/sh85037980						

Related Publication 🚱

Koch, Franziska. 2016. "Die »chinesische Avantgarde« und das Dispositiv der Ausstellung: Konstruktionen chinesischer Gegenwartskunst im Spannungsfeld der Globalisierung". Bielefeld: transcript, isbn: 978-3-8376-2617-9 http://www.transcriptverlag.de/978-3-8376-2617-9/die-chinesische-avantgarde-und-das-dispositiv-der-ausstellung

Subject 😯

Keyword 😯

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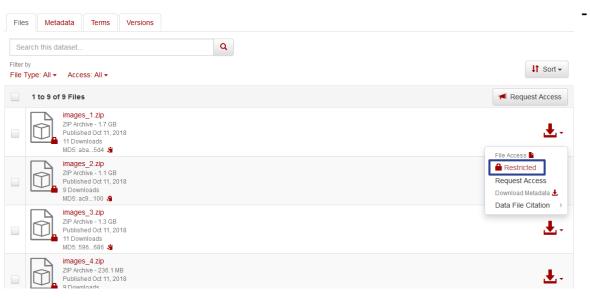
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	Casestudy_01_47_ArnouxIntro_en.xml casestudy_01/ XML - 104.5 KB Published Oct 28, 2020 4 Downloads MD5: 42b287 Text production of the project OwnReality	Variable Metadata Data File Citation

### Accessibility

- Download of public files via browser or via API





#### Accessibility

- Download of public files via browser or via API
  - "As open as possible, but as closed as necessary"



Unpublished Dataset Private URL – Privately share this dataset before it is published: https://heidata.uni-heidelberg.de/privateurl.xhtml?token=ffb013cb-25ae-46f0-904d-381190a8ca13

### **Test Dataset**

#### Draft Unpublished



Apel, Jochen, 2022, "Test Dataset", https://doi.org/10.11588/data/CKSXU7, heiDATA, DRAFT VERSION 3

Cite Dataset -

set 
- Learn about Data Citation Standards.

#### Accessibility

- Download of public files via browser or via API
- "As open as possible, but as closed as necessary"
- Private URLs for pre-publication access (e.g. for reviewers)



## Interoperability

Metadata standards

#### Metadata References

The Dataverse Project is committed to using standard-compliant metadata to ensure that a Dataverse installation's metadata can be mapped easily to standard metadata schemas and be exported into JSON format (XML for tabular file metadata) for preservation and interoperability.

Detailed below are what metadata schemas we support for Citation and Domain Specific Metadata in the Dataverse Project:

- Citation Metadata: compliant with DDI Lite, DDI 2.5 Codebook, DataCite 3.1, and Dublin Core's DCMI Metadata Terms (see .tsv version). Language field uses ISO 639-1 controlled vocabulary.
- Geospatial Metadata: compliant with DDI Lite, DDI 2.5 Codebook, DataCite, and Dublin Core (see .tsv version). Country / Nation field uses ISO 3166-1 controlled vocabulary.
- Social Science & Humanities Metadata: compliant with DDI Lite, DDI 2.5 Codebook, and Dublin Core (see .tsv version).
- Astronomy and Astrophysics Metadata : These metadata elements can be mapped/exported to the International Virtual Observatory Alliance's (IVOA) VOResource Schema format and is based on Virtual Observatory (VO) Discovery and Provenance Metadata (see .tsv version).
- Life Sciences Metadata: based on ISA-Tab Specification, along with controlled vocabulary from subsets of the OBI Ontology and the NCBI Taxonomy for Organisms (see .tsv version).
- Journal Metadata: based on the Journal Archiving and Interchange Tag Set, version 1.2 (see .tsv version).

See also the Dataverse Software 4.0 Metadata Crosswalk: DDI, DataCite, DC, DCTerms, VO, ISA-Tab document and the Metadata Customization section of the Admin Guide.



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#### Interoperability

- Metadata standards
- Advice on suitable file formats, support with format conversion
- Technical validity checks



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	1.2		Citation Metadata: Description (1 Changed); View Details			Jochen Apel	Jun 7, 2019
	1.1	Additio View De		n Metadata:	(1 Added);	Jochen Apel	Jun 6, 2019
	1.0	This is t	he first pub	lished versior	۱.	Leonhard Maylein, Hubert Mara, Jochen Apel	Jun 6, 2019

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Producer 😌	Hubert Mara (IWR, Heidelberg University) (HMara) https://orcid.org /0000-0002-2004-4153 Bartosz Bogacz (IWR, Heidelberg University) (BBogacz) https://orcid.org /0000-0002-2004-4153
Production Date 😣	2019-03-11
Production Place 😣	Heidelberg, Germany
Contributor 😯	Project Member : Bayer, Paul Victor
Deposit Date 😯	2019-02-25
Date of Collection 🕄	Start: 2018-07-24 ; End: 2018-08-22 Start: 2019-03-01 ; End: 2019-03-11
Kind of Data 😣	Cuneiform tablets; 3D Measurement data
Software 😯	GigaMesh Software Framework, Version: 181100 to 190300
Related Datasets 😣	Heidelberg Cuneiform 3D Database (HeiCu3Da) for the Hilprecht Collection: https://doi.org/10.11588/heidicon.hilprecht
Origin of Sources 😯	Hilprecht Sammlung, Jena, Germany, https://hilprecht.mpiwg-berlin.mpg.de/
	Cuneiform Digital Library Initiative (CDLI) https://cdli.ucla.edu/

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- Documentation files



## **Generic repositories**





https://zenodo.org/

https://osf.io/

https://dataverse.harvard.edu/

https://figshare.com/

- Providing suitable technology for FAIR Data, partly even very elaborate functionality
- No or only basic domain-specific functionalities
- Only basic individual counselling
- Non-commercial and commercial providers



# Wrap up

Managing data properly allows for reuse - by you or your community!

Managing data costs less than not managing it!

Manage data from the beginning of your research!

Manage data according to FAIR principles!

Use trustworthy data repositories!



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- 4 further sessions after April 2022



# Thank you!

### Jochen APEL Paola GALIMBERTI Milan JANÍČEK

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