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AI in research software

Part X: Research Data Management



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Research Data Unit at Heidelberg University



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<http://data.uni-heidelberg.de/>



Project Planning

Data Management Plans
Courses & workshops
Technical &

Data processing

heiBOX
heiCLOUD
SDS@hd
High Performance Computing

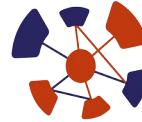
Data Archiving & Publication

heiDATA
heidICON
Archive - your data preserved
heiARCHIVE



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Newsletter Research Data Unit (RDU)

Update information regarding RDM at Heidelberg University:

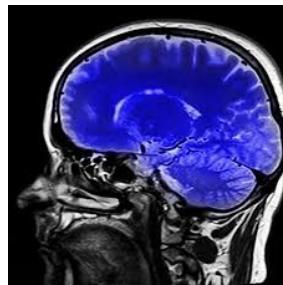
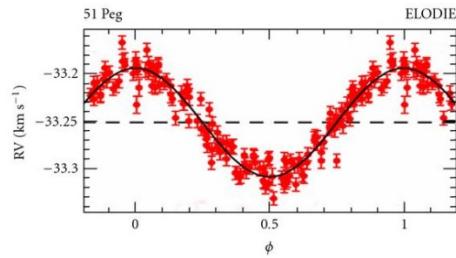
- new services
- current workshops
- Training courses
- Please subscribe to the mailing list: DATA-NEWS@LISTSERV.UNI-HEIDELBERG.DE
- <https://listserv.uni-heidelberg.de/cgi-bin/wa?A0=DATA-NEWS>



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WHAT IS RDM ABOUT?



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Data Driven Research



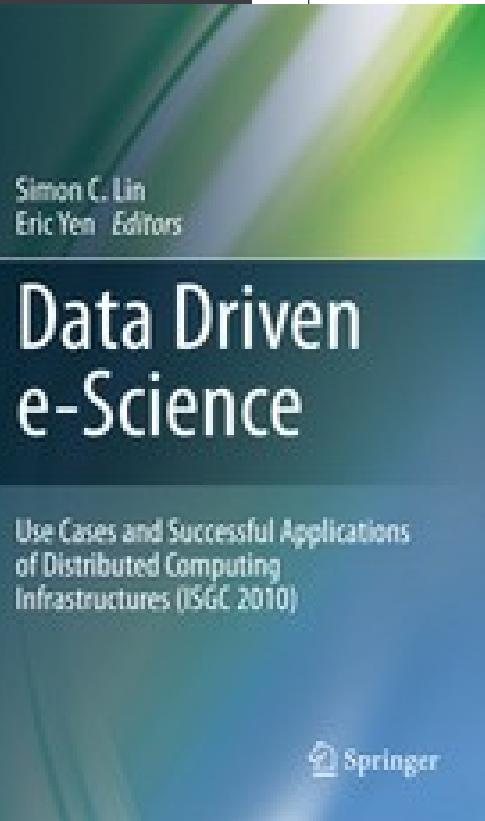
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The Economist Topics Print edition More

Regulating the internet giants

The world's most valuable resource is no longer

The data economy demands a new approach



Neelie Kroes

Member of the European Commission responsible for the digital agenda

the new gold

Check Against Delivery
Seul le texte prononcé fait foi
Es gilt das gesprochene Wort

Opening Remarks, Press Conference on Open Data Strategy

Brussels, 12th December 2011

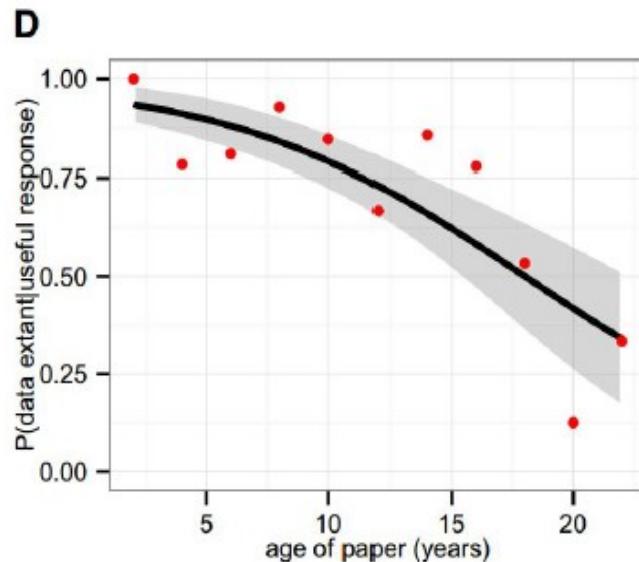


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Data Driven Research?



"The underlying data researchers analyze to come to their published conclusions ... **becomes less and less accessible to researchers over the years.**" (Vines et al, 2014; Dehnhard, Weichselgartner & Krampen, 2013; Wicherts et al, 2006)



(D) Predicted probability that the data were extant (either “shared” or “exist but unwilling to share”) given that we received a useful response.

Slide: [Dehnhard 2014](#)



Data Driven Research?



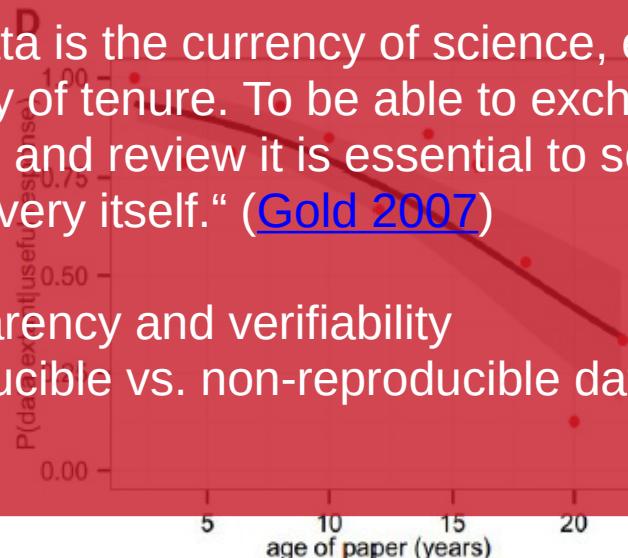
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"The underlying data researchers analyze to come to their published conclusions... becomes less and less accessible to

researchers over the years." (Vines et al, 2014; Dehnhard, Weichselgartner & Krampen, 2013; Wicherts et al, 2006)

Why is that disastrous?

- „[...] data is the currency of science, even if publications are still the currency of tenure. To be able to exchange data, communicate it, mine it, reuse it, and review it is essential to scientific productivity, collaboration, and to discovery itself.“ ([Gold 2007](#))
- Transparency and verifiability
- Reproducible vs. non-reproducible data
- Re-use



data were extant
(either “shared” or
“exist but unwilling
to
share”) given that
we received a useful
response.



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Slide: [Dehnhard 2014](#)

What is research data management?



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Research data management

"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).

'Making the Case for Research Data Management'. DCC Briefing Papers. Edinburgh: Digital Curation Centre.)



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



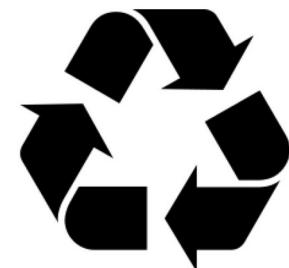
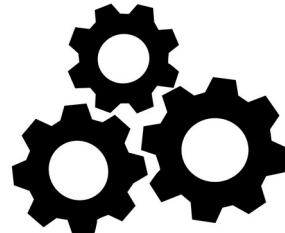
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FAIR Data Principles



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F indable A ccessible I nteroperable R eusable

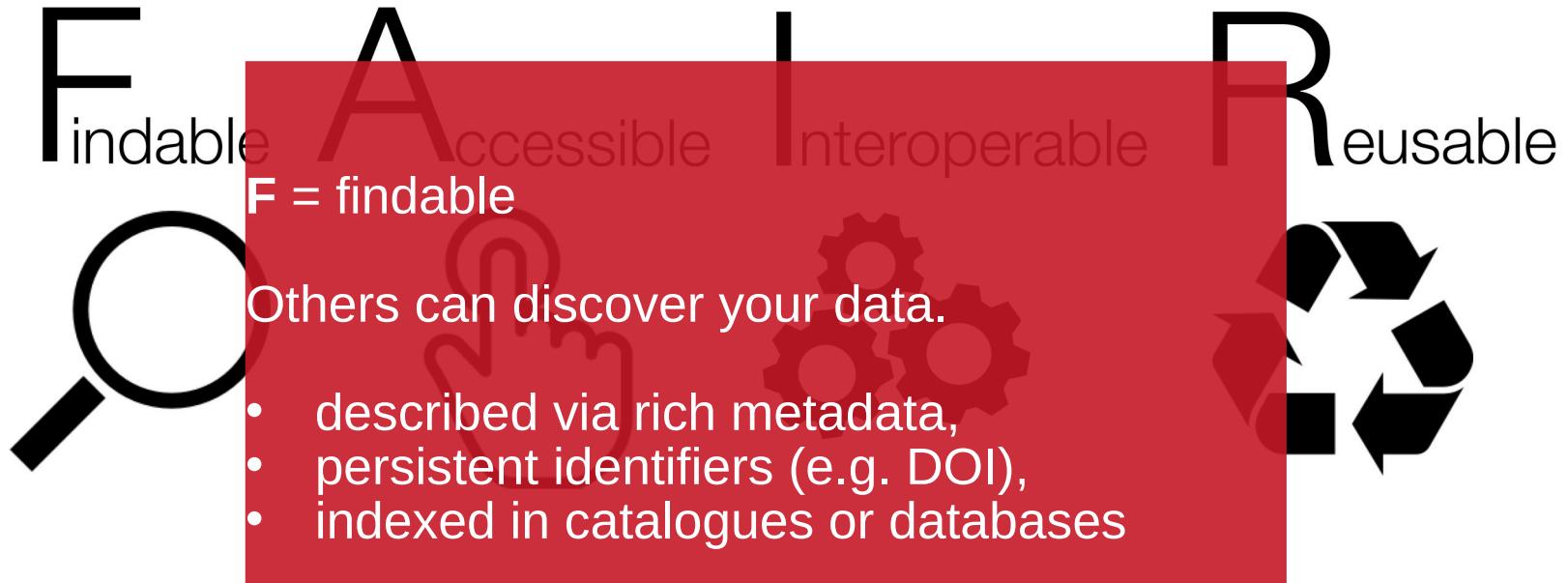


- [FAIR Data Principles](#)
- Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, *Scientific Data* 3, [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)
- SNF: [Explanation of the FAIR Data Principles](#)

FAIR Data Principles



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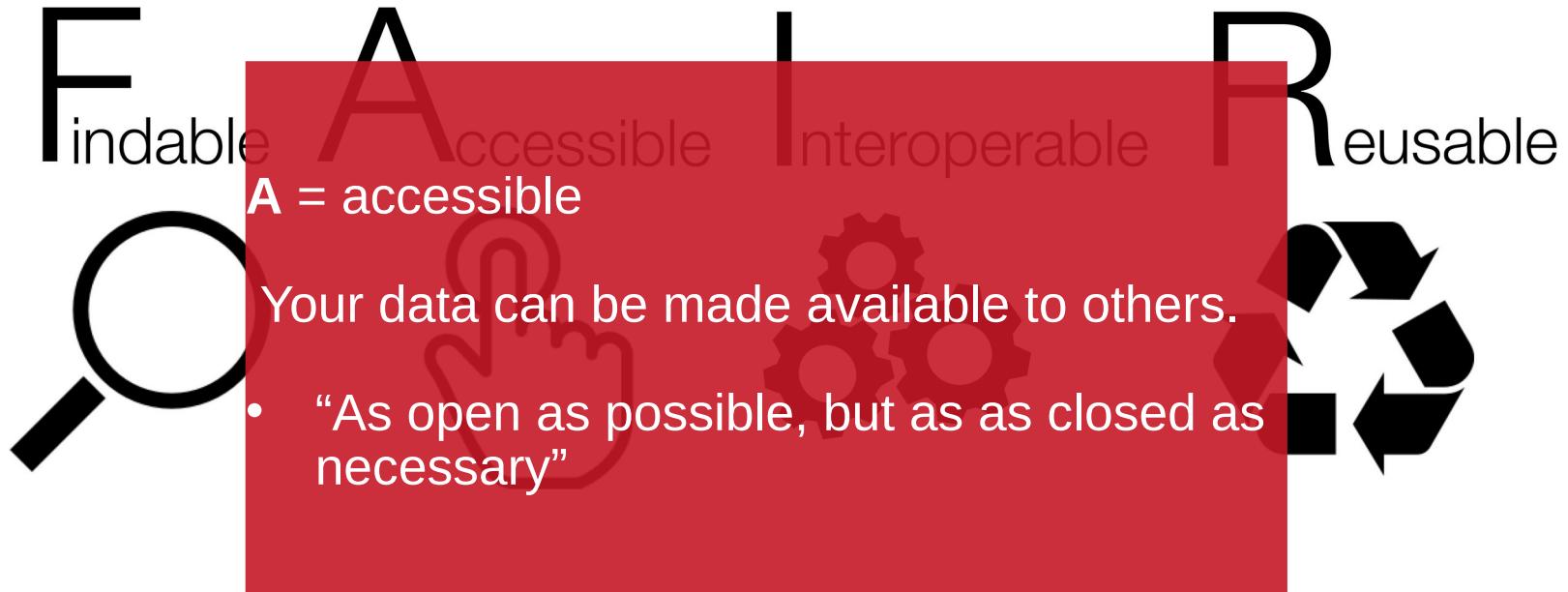


- [FAIR Data Principles](#)
- Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, *Scientific Data* 3, [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)
- SNF: [Explanation of the FAIR Data Principles](#)

FAIR Data Principles



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The graphic illustrates the four FAIR principles: Findable, Accessible, Interoperable, and Reusable. The letters F, A, I, and R are large black outlines. Behind them is a red rectangular area containing the word 'Accessible' in white. Below this, the text 'A = accessible' is displayed. To the left of the A is a magnifying glass icon. To the right of the R is a recycling symbol. In the background, there are faint icons of a padlock, a gear, and a hand pointing up.

Findable Accessible Interoperable Reusable

A = accessible

Your data can be made available to others.

- “As open as possible, but as closed as necessary”

- [FAIR Data Principles](#)
- Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, *Scientific Data* 3, [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)
- SNF: [Explanation of the FAIR Data Principles](#)

FAIR Data Principles



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Findable Accessible Interoperable Reusable
I = interoperable



Your data can be integrated with other data and/or easily used by machines



- standards for data & metadata
 - non-proprietary file formats
 - references to other (meta-)data
- [FAIR Data Principles](#)
 - Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, Scientific Data 3, [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)
 - SNF: [Explanation of the FAIR Data Principles](#)



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FAIR Data Principles



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Findable Accessible Interoperable Reusable
R = re-usable



Your data can be used for new research as well as for replications.



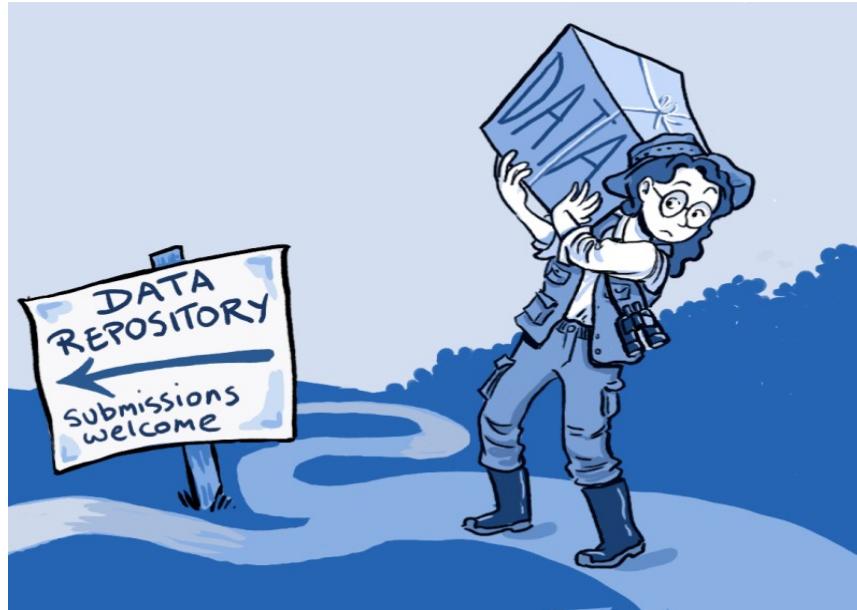
- Data are comprehensibly described with relevant attributes,
- domain-relevant standards,
- open licenses,
- provenance
- Wilkinson et al. (2016) *The FAIR Guiding Principles for scientific data management and stewardship*, *Scientific Data* 3, doi:10.1038/sdata.2016.18
- SNF: [Explanation of the FAIR Data Principles](#)



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Picture: Ainsley Seago. doi:10.1371/journal.pbio.1001779.g001

OPEN RESEARCH DATA



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- **National Research Data Infrastructure**
- The National Research Data Infrastructure (NFDI) has the objective to systematically index, edit, interconnect and make available the valuable stock of data from science and research.
- Funding for subject- and/or methods-specific consortia
- Overall budget: 85 Mio € per year for 10 years
- 27 subject-specific consortia
- <https://www.nfdi.de/>





The German Human Genome-Phenome Archive

We are building a **secure national omics data infrastructure**, enabling the use of human genome data for research purposes while preventing data misuse.

[Our Mission](#)

GHGA Metadata Catalog

A public frontend for the discovery of human omics study data from German research institutions.

[Learn More](#)

Consent Tools

GHGA has developed different tools to help clinicians, researchers and institutions wanting to submit omics data to GHGA.

[Learn more](#)

GHGA Lecture Series

"Advances in Data-Driven Biomedicine" diving into fascinating world of data-driven medicine and their ethical, legal and social implications.

[Learn more](#)

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Chemistry Data Days 2023

June 6-7 at JGU Mainz



NFDI4Chem

Chemistry Consortium in the NFDI

NFDI4Chem is an initiative to build an open and FAIR infrastructure for research data management in chemistry. NFDI4Chem is supported by the German Chemical Society (GDCh), German Bunsen Society for Physical Chemistry (DBG) and German Pharmaceutical Society (DPhG) – representing approximately 40,000 members – to reach out to the chemistry community as a whole. NFDI4Chem is lead by the Applicant Institution Friedrich-Schiller-University Jena.

What can we do for you?



Events

- Chemical Research Data Management in a Nutshell 09.05.2023 @ 8:30 – 16:30 CEST
- InChI Workshop on Inorganic Stereochemistry 10.05.2023 @ 11:00 CEST – 11.05.2023 @ 17:00 CEST
- Chemation ELN Q&A Session 25.05.2023 @ 15:00 – 16:00 CEST

[View all Events](#)

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NFDI4Culture – Consortium for Research Data on Material and Immaterial Cultural Heritage

We establish a needs-based infrastructure for research data ranging from architecture, art history and musicology to theatre, dance, film and media studies.

Enter keywords...



Search



Consortium for the Social, Behavioural, Educational and Economic Sciences

Search Contact DE

Latest news

RatSWD

Data centres

KonsortSWD

KonsortSWD

As part of the NFDI, KonsortSWD is expanding its services for research with data in the social, educational, behavioural and economic sciences.

RATSWD ELECTION

Science has voted. To the election results →

PRESS RELEASE, 07.02.2023

Researchers between the obligation of confidentiality and the duty of disclosure →

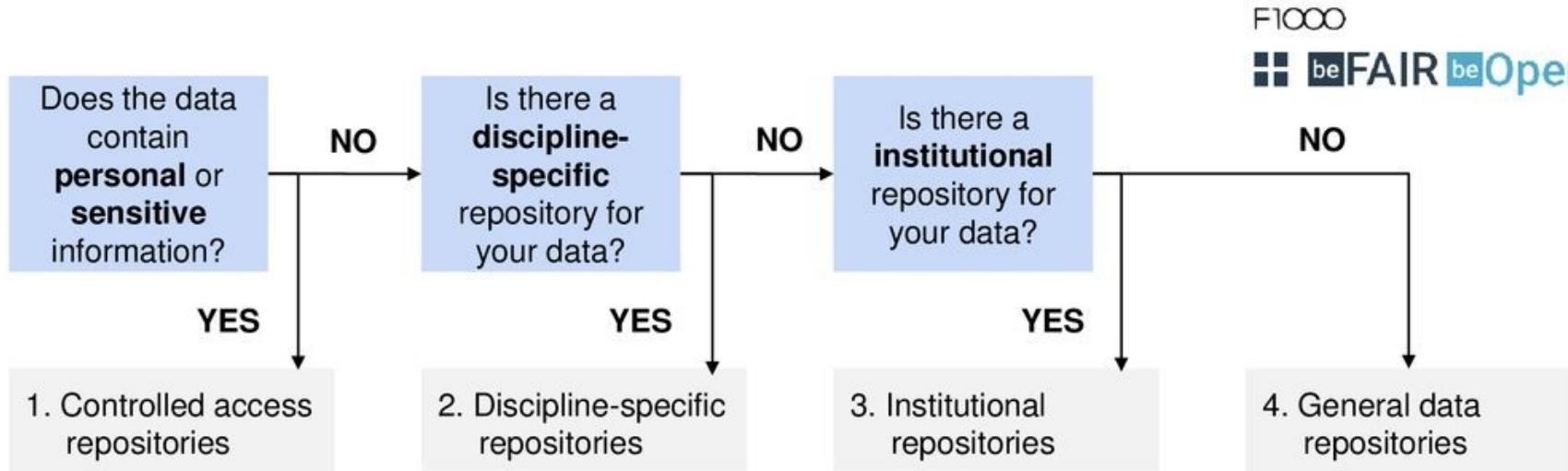
NEWS, 21.03.2023

Second call for applications project funding research data management →

27./28. MARCH 2023, BERLIN

9th Conference on Social and Economic Data →

Repositories



Etc...

Slide adapted from: N. Jareborg (2019), „Data management and repositories“, <https://player.slideplayer.com/105/17629367/>.

Finding repositories



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Screenshot of the re3data.org homepage. It features a large search bar at the top with the text "Search...". Below the search bar is the logo "re3data.org" with the subtitle "REGISTRY OF RESEARCH DATA REPOSITORIES". The background of the page shows a blue-toned landscape image.

Screenshot of the FAIRsharing.org homepage. The header includes the logo "FAIRsharing.org" and a search bar with the placeholder "search through all content". Below the header is a dark banner with white text: "A curated, informative and educational resource on data and metadata standards, inter-related to databases and data policies." and "We guide consumers to discover, select and use these resources with confidence, and producers to make their resource more discoverable, more widely adopted and cited." At the bottom of the page are navigation links: "RESEARCHERS", "DEVELOPERS & CURATORS", "JOURNAL PUBLISHERS" (which is underlined in red), and "LIBRARIES".

<https://www.re3data.org/>

Publisher Guidelines

- <https://www.nature.com/sdata/policies/repositories>
- <https://journals.plos.org/plosone/s/recommended-repositories>
- <https://www.springernature.com/gp/authors/research-data-policy/recommended-repositories>

Data publication



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- Data upload restrictions ▾
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- Institution type ▾
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machine learning

← Previous 1 Next →

Found 4 result(s)

UCI Machine Learning Repository

UC Irvine Machine Learning Repository



Communication Science Artificial Intelligence, Image and Language Processing Computer Science Social Sciences

Social and Behavioural Sciences Humanities and Social Sciences Computer Science, Electrical and System Engineering Engineering Sciences

Content type(s)

Standard office documents Archived data Plain text Databases

Country

United States

The UCI Machine Learning Repository is a collection of databases, domain theories, and data generators that are used by the machine learning community for the empirical analysis of machine learning algorithms. It is used by students, educators, and researchers all over the world as a primary source of machine learning data sets. As an indication of the impact of the archive, it has been cited over 1000 times.

OpenML

Open Machine Learning



Education Sciences Computer Science Social and Behavioural Sciences Humanities and Social Sciences

Computer Science, Electrical and System Engineering Engineering Sciences

Content type(s)

Standard office documents Structured graphics Plain text Software applications Source code Configuration data other Databases

Country

Belgium European Union Netherlands

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.



OpenML

General

Institutions

Terms

Standards

Name of repository

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

Repository type(s)

disciplinary

Mission statement for
designated community

<http://www.openml.org>

heiDATA

General Institutions Terms Standards

Name of repository

heiDATA

Additional name(s)

heiDATA Institutional Repository for Research Data of Heidelberg University

Repository URL

<https://heidata.uni-heidelberg.de>

Subject(s)

Humanities Social and Behavioural Sciences Economics Jurisprudence Biology Medicine
Microbiology, Virology and Immunology Agriculture, Forestry, Horticulture and Veterinary Medicine
Chemistry Physics Geosciences (including Geography)
Computer Science, Electrical and System Engineering Humanities and Social Sciences Life Sciences
Agriculture, Forestry, Horticulture and Veterinary Medicine Natural Sciences Engineering Sciences

Description

heiDATA is Heidelberg University's research data repository. It is managed by the Competence Centre for Research Data, a joint institution of the University Library and the Computing Centre. All researchers affiliated with Heidelberg University can use this service for archiving and publishing their data.

Contact

<http://www.data.uni-heidelberg.de/contact.html>

Content type(s)

Standard office documents Databases Raw data Structured text Source code other Images
Structured graphics Audiovisual data Scientific and statistical data formats Plain text Structured text
Archived data

Keyword(s)

data processing computer science linguistics economics geography history mathematics
social science chemistry earth sciences modern languages



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Heidelberg
Open Research Data

heiDATA (Heidelberg University)

Competence Centre for Research Data

Metrics

61,905 Downloads

Contact Share

heiDATA is an institutional repository for Open Research Data from Heidelberg University. It is managed by the Competence Centre for Research Data, a joint institution of the University Library and the Computing Centre. If you are interested in publishing your data here, please see our [author instructions](#) and [get in touch with us](#).



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(3DMM2O)



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3D Spatial Data Processing

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Department (6)

Journal (6)

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Accuracy of rapid point-of-care antigen-based diagnostics for SARS-CoV-2: an updated systematic review and meta-analysis with meta regression analyzing influencing factors [Research Data]

Feb 25, 2022 - Tropical Medicine

Brümmer, Lukas E.; Katzenschlager, Stephan; McGrath, Sean; Schmitz, Stephani; Gaeddert, Mary; Erdmann, Christian; Bota, Marc; Grilli, Maurizio; Lermann, Jan; Weigand, Markus A.; Pollock, Nira R.; Macé, Aurélien; Erkosal, Berra; Carmona, Sergio; Sacks, Jilian A.; Ongarello, Stefano; Denkinger, Claudia M., 2022, "Accuracy of rapid point-of-care antigen-based diagnostics for SARS-CoV-2: an updated systematic review and meta-analysis with meta regression analyzing influencing factors [Research Data]", <https://doi.org/10.11588/data/T3MIB0>, heiDATA, V1

Background Comprehensive information about the accuracy of antigen rapid diagnostic tests (Ag-RDTs) for SARS-CoV-2 is essential to guide public health decision makers in choosing the best tests and testing policies. In August 2021, we published a systematic review and meta-



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Experimental Biophysics Dataverse (Heidelberg University - Kirchhoff-Institute for Physics)

heiDATA Dataverse > Experimental Biophysics Dataverse > SPDM data capturing radiation induced chromatin conformation changes

All Metrics 70 Downloads

SPDM data capturing radiation induced chromatin conformation changes

Hausmann, Michael; Müller, Patrick; Hillebrandt, Sabina; Bach, Margund; Kaufmann, Rainer; Zhang, Yang, 2015, "SPDM data capturing radiation induced chromatin conformation changes", doi:10.11588/data/10031, heiDATA Dataverse, V3

Cite Dataset Learn about Data Citation Standards

Description

Using stably transfected HeLa cells expressing either green fluorescent protein (GFP) labelled histone H2B or yellow fluorescent protein (YFP) labelled histone H2A, we investigated the positioning of individual histone proteins in cell nuclei by means of high resolution localization microscopy (Spectral Position Determination Microscopy = SPDM). The cells were exposed to ionizing radiation of different doses and aliquots were fixed after different repair times for SPDM imaging. In addition to the repair dependent histone protein pattern, the positioning of antibodies specific for heterochromatin and euchromatin was recorded by SPDM.

Experimental data was acquired in the Experimental Biophysics group by Michael Hausmann, Patrick Müller, Sabina Hillebrandt, Margund Bach and Rainer Kaufmann.

Kernel Density Estimations of the experimental data and the maskings of the regions of interest based on the KDEs were calculated by Yang Zhang, a member of the Statistical Physics and Theoretical Biophysics Group.

Related Publication

Zhang Y, Máté G, Müller P, Hillebrandt S, Krufczik M, et al. (2015) Radiation induced Chromatin Conformation Changes Analysed by Fluorescent Localization Microscopy, Statistical Physics, and Graph Theory. PLoS ONE 10(6): e0128555. doi: 10.1371/journal.pone.0128555

Dataset Version: 3.0

Files Metadata Terms Versions

Findability - DOI's





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Experimental Biophysics Dataverse (Heidelberg University - Kirchhoff-Institute for Physics)

heiDATA Dataverse > Experimental Biophysics Dataverse > SPDM data capturing radiation induced chromatin conformation changes

Metrics 70 Downloads

SPDM data capturing radiation induced chromatin conformation changes

Hausmann, Michael; Müller, Patrick; Hillebrandt, Sabina; Bach, Margund; Kaufmann, Rainer; Zhang, Yang, 2015, "SPDM data capturing radiation induced chromatin conformation changes", doi:10.11588/data/10031, heiDATA Dataverse, V3

Cite Dataset Learn about Data Citation Standards

Description Using stably transfected HeLa cells expressing either green fluorescent protein (GFP) labelled histone H2B or yellow fluorescent protein (YFP) labelled histone H2A, we have analysed the radiation induced chromatin conformation changes by fluorescence localization microscopy. We have used the statistical physics and graph theory to analyse the chromatin conformation changes. The results show that the radiation induced chromatin conformation changes can be analysed by fluorescence localization microscopy, Statistical Physics, and Graph Theory.

Radiation Induced Chromatin Conformation Changes Analysed by Fluorescent Localization Microscopy, Statistical Physics, and Graph Theory

Yang Zhang, Gabriell Máté, Patrick Müller, Sabina Hillebrandt, Matthias Krufczik, Margund Bach, Rainer Kaufmann, Michael Hausmann

PLOS

Abstract Introduction Materials and Methods Results Discussion Acknowledgments Author Contributions References

Citation: Zhang Y, Máté G, Müller P, Hillebrandt S, Krufczik M, Bach M, et al. (2015) Radiation Induced Chromatin Conformation Changes Analysed by Fluorescent Localization Microscopy, Statistical Physics, and Graph Theory. PLoS ONE 10(6): e0128555. doi:10.1371/journal.pone.0128555

Academic Editor: Martin Fernandez-Zapico, Schulze Center for Novel Therapeutics, Mayo Clinic, UNITED STATES

Received: October 18, 2014; Accepted: April 28, 2015; Published: June 4, 2015

Copyright: © 2015 Zhang et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are cited.

Dataset Version: 3.0

Files Metadata Terms Versions

Reader Media Figures

Data Availability: The experimental data and the in-house developed software used for the analysis can be reached through the HeiDATA Dataverse Network, DOI:10.11588/data/10031.





Findability - DOI's



Journal of Geophysical Research: Oceans

RESEARCH ARTICLE

10.1002/2017JC013678

Key Points:

- First bomb-¹⁴C peak reconstruction in the high-latitude NW Pacific made with a high-resolution analysis of long-lived bivalve shells
- Relatively high bomb-¹⁴C peak, though at high latitude (40°N), is due to water transport by Kuroshio Current
- Bomb-¹⁴C record provides a reliable tracer of water mixing

Bomb-¹⁴C Peak in the North Pacific Recorded in Long-Lived Bivalve Shells (*Mercenaria stimpsoni*)

Kaoru Kubota^{1,2,3} , Kotaro Shirai², Naoko Murakami-Sugihara², Koji Seike^{2,4} , Masayo Minami⁵, Toshio Nakamura³, and Kazushige Tanabe⁵

¹Kochi Institute for Core Sample Research, Japan Agency for Marine-Earth Science and Technology, Nankoku, Japan,

²Atmosphere and Ocean Research Institute, University of Tokyo, Chiba, Japan, ³Institute for Space-Earth Environmental Research, Nagoya University, Furo-cho, Nagoya, Japan, ⁴Now at Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, ⁵Department of Earth and Planetary Science, University of Tokyo, Bunkyo, Japan





Findability - DOI's



Journal of Geophysical Research: Oceans

RESEARCH ARTICLE Bomb- ^{14}C Peak in the North Pacific Recorded in Long-Lived

Proceedings of the National Academy of Sciences of the United States of America, 112, 9542–9545.

Guilderson, T. P., Schrag, D. P., Kashgarian, M., & Suthon, J. (1998). Radiocarbon variability in the western equatorial Pacific inferred from a high-resolution coral record from Nauru Island. *Journal of Geophysical Research*, 103, 24641–24650.

Hammer, S., & Levin, I. (2017). Monthly mean atmospheric $\Delta^{14}\text{CO}_2$ at Jungfraujoch and Schauinsland from 1986 to 2016 (heiDATA Dataverse V2). Heidelberg: Heidelberg University. <https://doi.org/10.11588/data/10100>

Hanawa, K. (1983). Sea surface temperature off Sanriku coast and east of Tsugaru Strait monitored by ferry Ishikari (I). *Tohoku Geophysical Journal*, 29, 129–149.

Hanawa, K., & Mitsudera, H. (1986). Variation of water system distribution in the Sanriku Coastal Area. *Journal of the Oceanographic Society of Japan*, 42, 435–446.

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Ishizu, M., Itoh, S., & Tanaka, K. (2016). Influence of the Oyashio Current and Tsugaru Warm Current on the circulation and water properties





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	<p>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).</p> <p>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 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.</p> <p>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.</p> <p>A typical use of the kmz-file that visualizes GECCA mapped is Google Earth.</p>

Subject

Arts and Humanities

Keyword

contemporary Chinese art

group exhibitions

North America (general region) (TGN) <http://vocab.getty.edu/tgn/7029440>

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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: transcript. ISBN: 978-3-8376-2617-9 <http://www.transcript-verlag.de/978-3-8376-2617-9/die-chinesische-avantgarde-und-das-dispositiv-der-ausstellung>

Languages

Chinese English



Findability

- DOI's
- Metadata



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.
Description ?	<p>Franziska Koch (Heidelberg Centre for Transcultural Studies, Global Art History, Heidelberg University, Germany)</p> <p>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).</p> <p>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 part the whole of Chinese artistic production, although it actually tends to e "national ink painting" (guohua), conventional or conservative academ consumption oriented subject matter, including mass-produced decor</p> <p>With 60 exhibitions entries, the data that GECCA mapped visualizes is which contains more than 700 exhibition entries. The data was individut institution, dates, exhibition topic, participating artists and curators. Th museum websites, archival documentation of public art libraries and o</p> <p>A typical use of the kmz-file that visualizes GECCA mapped is Google</p>

Subject ?
Arts and Humanities

Keyword ?
contemporary Chinese art

group exhibitions

North America (general region) (TGN) <http://vocab.getty.edu/tgn/7029>

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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.transcript-verlag.de/978-3-8376-2617-9/die-chinesische-avantgarde-und-das-dispositiv-der-ausstellung>

Language ?

Chinese English



Findability

- DOI's
- Metadata

Life Sciences Metadata ▲

Design Type ?	Not Specified
Factor Type ?	Cell Type/Cell Line, Developmental Stage, Organism
Organism ?	Homo sapiens; Mus musculus
Other Organism ?	Monodelphis domestica
Measurement Type ?	transcription profiling
Technology Type ?	nucleotide sequencing
Other Technology Type ?	single nucleus RNA-seq
Technology Platform ?	illumina
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Google Scholar search results for "correlations highly prevalent dental conditions chronic diseases". The results page shows 31,400 entries. One result is highlighted:

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MW Seitz, S Listl, A Bartols, L Schubert, K Blaschke... - 2019 - heidata.uni-heidelberg.de

... We provide an overview of systematic reviews reporting on correlations between dental conditions and chronic diseases with an assessment of the evidence and extent of correlation ...

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Understanding Bank-Run Contagion [Dataset]

Trautmann, Stefan; Brown, Martin; Vlahu, Razvan

Date: • 2016-05-03

Description:

We study experimental coordination games to examine through which transmission channels, and under which information conditions, a panic-based depositor-run at one bank may trigger a panic-based depositor-run at another bank. We find that withdrawals at one bank trigger withdrawals at another bank by increasing players' beliefs that other depositors in their own bank will withdraw, making them more likely to withdraw as well. Observed withdrawals only affect depositors' beliefs, and are thus contagious, when they form an informative signal about bank fundamentals.

Subject:



Findability

- DOI's
- Metadata
- Indexing in catalogs and databases (enabling automatic harvesting of metadata)

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Understanding Bank-Run Contagion [Dataset]

DOI

We study experimental coordination games to examine through which transmission channels, and under which information conditions, a panic-based depositor-run at one bank may trigger a panic-based depositor-run at another bank. We find that withdrawals at one bank trigger withdrawals at another bank by increasing players' beliefs that other depositors in their own bank will withdraw, making them more likely to withdraw as well. Observed withdrawals only affect depositors' beliefs, and are thus contagious, when they form an informative signal about bank fundamentals.

Bank runs Contagion Social Sciences Systemic risk

Identifier

DOI	https://doi.org/10.11588/data/10074
Related Identifier	https://doi.org/10.1287/mnsc.2015.2416
Metadata Access	https://heidata.uni-heidelberg.de/oai?verb=GetRecord&metadataPrefix=oai_datacite&identifier=oai:10.11588/data/10074



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- **Dataverses: collection of datasets e.g. For research groups, projects,...**





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3D Matter Made to Order (3DMM2O) (Heidelberg University and Karlsruhe Institute of Technology (KIT))

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Data publications from the Cluster of Excellence 3D Matter Made to Order (3DMM2O). The Cluster is a collaboration of Karlsruhe Institute of Technology (KIT) and Heidelberg University. It pursues an interdisciplinary approach through conjunction of natural, engineering, and social sciences. 3DMM2O establishes scalable digital 3D Additive Manufacturing transcending from the molecular to the macroscopic scale. The goal is the ultimate digitalization of 3D manufacturing and material processing.

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Author Name
Rominger, Frank (7)
Mastalerz, Michael (5)
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Elbert, Sven Michael (2)
Freudenberg, Jan (2)

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Reinhard, Dennis; Rominger, Frank; Mastalerz, Michael, 2022, "Desymmetrization Strategy to Achieve Triptycene-Based 3,6-Dimethoxytriphenylenes via Oxidative Cyclodehydrogenation [Data]", <https://doi.org/10.11588/data/OH6757>, heiDATA, V1
To achieve a highly symmetric triptycene based hexamethoxytriphenylene in high yield of 97 %, a less symmetric triptycene (C3v) is necessary as precursor for cyclodehydrogenative Scholl-type oxidation, by taking into account the regioselectivity of the C-C bond formation controll...

Findability

- DOI's
- Metadata
- Indexing in catalogs and databases (enabling automatic harvesting of metadata)
- **Dataverses: collection of datasets e.g. For research groups, projects,...**





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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:

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- **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.
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- **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](#)).
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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
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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/>
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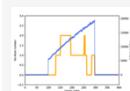


Synthetic Quantum Systems SynQS Synthetic Quantum Systems (SynQS) (Kirchhoff Institute for Physics, Heidelberg University)

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Stochastic dynamics of a few sodium atoms in presence of a cold potassium cloud [data]

Version 2.0



Bhatt, Rohit Prasad; Kilinc, Jan; Höcker, 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/HRCX1P>, heiDATA, V2, UNF:6.JJrxDHuluVKxO7FoMyqAw== [fileUNF]

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Description ⓘ

We provide the data and our jupyter notebooks 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 atom counting the stochastic dynamics of a few sodium atoms in presence of a cold potassium cloud. This capability enables us to rule out the effect of inter-species interaction on sodium atom number dynamics, at very low atomic densities present in these experiments. We study the noise sources for sodium and potassium in a common framework. Thereby, we assign the detection limits to 4.3 atoms for potassium and 0.2 atoms (corresponding to 96% fidelity) for sodium. This opens possibilities for future experiments with a few atoms immersed in a quantum degenerate gas.

Subject ⓘ

Physics

Keyword ⓘ

Ultracold mixture, Stochastic dynamics

Related Publication ⓘ

Bhatt, R., Kilinc, J., Höcker, L., Jendrzejewski, F. Stochastic dynamics of a few sodium atoms in presence of a cold potassium cloud. Sci. Rep. doi: [10.1038/s41598-022-05778-8](https://doi.org/10.1038/s41598-022-05778-8)

Notes ⓘ

Run jupyter notebooks with binder: <https://mybinder.org/>

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The screenshot shows the OpenNeuro MRI portal. At the top, there's a teal header with the OpenNeuro logo, a search bar, support and FAQ links, and a sign-in button. Below the header, the section title "OpenNeuro MRI" is displayed, followed by a brief description of the platform's purpose: "The OpenNeuro platform was developed by the [Stanford Center for Reproducible Neuroscience](#) as a tool to encourage and enhance data sharing and analysis of raw MRI data, using [BIDS](#) to organize and standardize these data." Below the description, two statistics are shown: "18.165 Participants" and "518 Public Datasets". To the right of the text is a large, stylized 3D cube visualization showing internal brain structures. The main content area is titled "Search MRI Portal" and contains a search bar with placeholder text "Enter Keyword(s) to Search" and a plus icon. Below the search bar are filters for "MODALITY: MRI" and "AGE: 20 - 30". On the left, there are dropdown menus for "Choose Modality", "Age of Participants" (with a slider from 20 to 30), "Number of Participants", "Diagnosis" (listing "Healthy / Control", "Schizophrenia", "ADD/ADHD", and "Alzheimers"), and a "Keywords" search bar. In the center, a search result for a dataset titled "Increasing stimulus similarity drives nonmonotonic representational change in hippocampus" is shown. The result includes details like "MODALITY: MRI", "TASKS: AB Pairs, Random Ordered", and technical metadata such as "OPENNEURO ACCESSION NUMBER: ds004006", "SESSIONS: 1", "PARTICIPANTS: 41", "PARTICIPANTS' AGES: 18 - 35", "SIZE: 110.45GB", and "FILES: 721".

- Domain-specific metadata enable specific functionalities and more effective retrieval.



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Body Motor

OpenNeuro Accession Number: ds003972 Files: 122 Size: 3.62GB

BIDS Validation **3 WARNINGS**

We found **3 Warnings** in your dataset. You are not required to fix warnings, but doing so will make your dataset more BIDS compliant.

VIEW 3 WARNINGS IN 74 FILES

Warning: 1 Not all subjects/sessions/runs have the same scanning parameters.

Warning: 2 Tabular file contains custom columns not described in a data dictionary.

Warning: 3 The onset of the last event is after the total duration of the corresponding scan. This design is suspiciously long.

Body Motor
dataset_description.json
participants.json
participants.tsv
README

Follow 1 **Bookmark** 0

Authors
Schellekens, W., Bakker, C., Ramsey, N.F., Petridou, N.

Available Modalities
MRI

Versions
1.0.0 Created: 2021-12-10

Tasks
Body Motor

Uploaded by
Wouter Schellekens on 2022-01-04 - about 2 months ago

Last Updated
2021-12-10 - 3 months ago

Sessions
1

Participants
8

Dataset DOI
[doi:10.18112/openneuro.ds003972.v1.0.0](https://doi.org/10.18112/openneuro.ds003972.v1.0.0)

- Domain-specific metadata enable specific functionalites and more effective retrieval.
- **Data standards are implemented and data are validated against these standards.**



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The screenshot shows the BIDS website homepage and a comparison of two folder structures. On the left, the BIDS homepage features a large brain image and the title 'Brain Imaging Data Structure' with the subtitle 'A simple and intuitive way to organize and describe your neuroimaging and behavioral data.' Below the title is a navigation bar with links: ABOUT, NEWS, BENEFITS, SPECIFICATION, GET STARTED, GET INVOLVED, GOVERNANCE, and ACKNOWLEDGMENTS. On the right, under the heading 'About BIDS', there is a paragraph explaining the need for a standard data organization. Below this is a detailed comparison of two folder structures. A large white arrow points from the 'dicomdir' structure on the left to the 'my_dataset' structure on the right.

dicomdir/	my_dataset/
└── 1208200617178_22/	└── participants.tsv
└── 1208200617178_22_8973.dcm	└── sub-01/
└── 1208200617178_22_8943.dcm	└── anat/
└── 1208200617178_22_2973.dcm	└── sub-01_T1w.nii.gz
└── 1208200617178_22_8923.dcm	└── func/
└── 1208200617178_22_4473.dcm	└── sub-01_task-rest_bold.nii.gz
└── 1208200617178_22_8783.dcm	└── sub-01_task-rest_bold.json
└── 1208200617178_22_7328.dcm	└── dwi/
└── 1208200617178_22_9264.dcm	└── sub-01_dwi.nii.gz
└── 1208200617178_22_9967.dcm	└── sub-01_dwi.json
└── 1208200617178_22_3894.dcm	└── sub-01_dwi.bval
└── 1208200617178_22_3899.dcm	└── sub-01_dwi.bvec
└── 1208200617178_23/	└── sub-02/
└── 1208200617178_24/	└── sub-03/
└── 1208200617178_25/	└── sub-04/

- Domain-specific metadata enable specific functionalites and more effective retrieval.
- **Data standards are implemented and data are validated against these standards.**



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E BRAINS

Share data About Login

Search (e.g. brain or neuroscience) SEARCH

CATEGORIES

Project	124
Dataset	1215
Model	107
Software	163
Contributor	1763

FILTERS

MODALITY

<input type="checkbox"/> microscopy	828
<input type="checkbox"/> neuroimaging	754
<input type="checkbox"/> histological approach	596
<input type="checkbox"/> anatomical approach	586
<input type="checkbox"/> anatomy	232
<input type="checkbox"/> neural connectivity	210
<input type="checkbox"/> histology	208
<input type="checkbox"/> expression characterization	100
<input type="checkbox"/> electrophysiology	99
<input type="checkbox"/> multimodal research	90

[View more](#)

SPECIES

<input type="checkbox"/> Homo sapiens	852
<input type="checkbox"/> Mus musculus	155
<input type="checkbox"/> Rattus norvegicus	115
<input type="checkbox"/> Macaca fascicularis	33
<input type="checkbox"/> Macaca mulatta	14
<input type="checkbox"/> Mustela putorius	4
<input type="checkbox"/> Chlorocebus aethiops sabaeus	2
<input type="checkbox"/> Danio rerio	1

Viewing 1-20 of 1215 results Sort by Relevance

1000BRAINS study, connectivity data (v1.1)
The human brain shows considerable interindividual variability, particularly during the course of aging, which is influenced by genetic and environmental factors. To characterize this variability across a wide range o...

Keywords:
 imaging

Methods:
 diffusion-weighted magnetic resonance imaging (DWI)
 fiber tract reconstructions
 Spatial atlas registration

Preprocessed data from the Individual Brain Charting (IBC) project
We present the preprocessed version of the Individual Brain Charting dataset – a high spatial-resolution, multi-task, functional Magnetic Resonance Imaging dataset, intended to support the investigation on the functio...

Keywords:
 attention
 audition
 behaviour assay

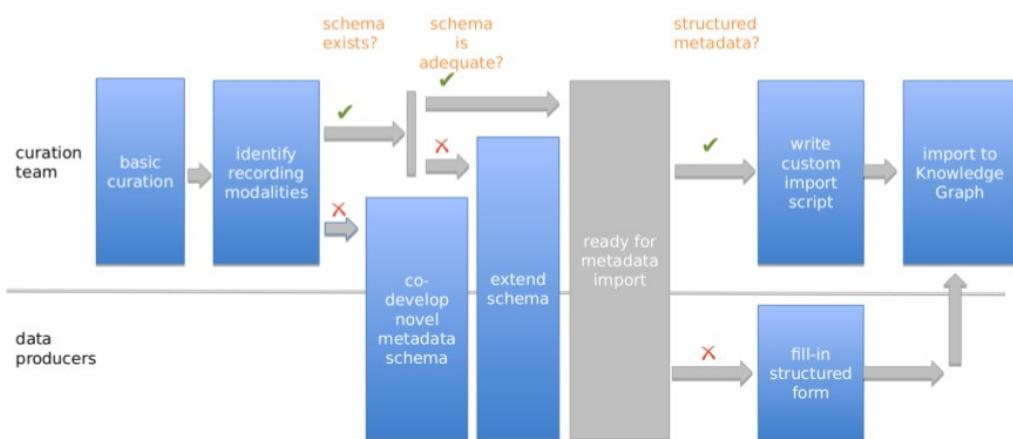
Methods:
 functional magnetic resonance imaging (fMRI)
 nonlinear image registration
 nonlinear transformation
 rigid motion correction
 anatomical segmentation technique

- Domain-specific metadata enable specific functionalities and more effective retrieval.
- Data standards are implemented and data are validated against these standards.
- **May be limited with regard to data types (e.g. OpenNeuro only accepts human-derived data)**

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<https://wiki.ebrains.eu/bin/view/Collabs/tier-3-data-curation/Data%20Curator%27s%20Handbook/>

- Domain-specific metadata enable more effective retrieval or specific functionalities.
- Data standards are implemented and data are validated against these standards.
- May be limited with regard to data types (e.g. OpenNeuro only accepts human-derived data)
- **Optional, depending on the repository: Data curators with specific expertise supervise data publication and help preparing data for deposit.**



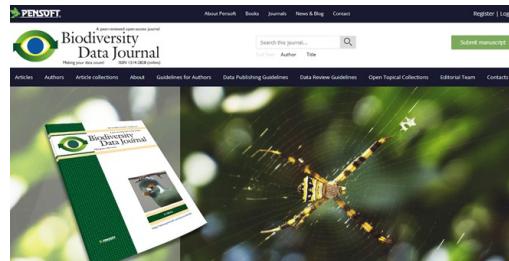
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Finding data journals



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https://www.forschungsdaten.org/index.php/Data_Journals



scientific data

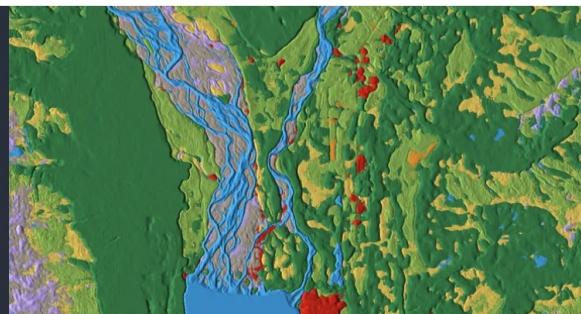
[Explore content](#) [About the journal](#) [Publish with us](#)

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[Sign up for alerts](#) [RSS feed](#)

nature > scientific data

Dynamic World, Near real-time global 10m land use land cover mapping

Christopher F. Brown, Steven P. Brumby ... Alexander M. Tait
[Data Descriptor](#) | 09 June 2022



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Data publication



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A red and white triangular road sign with a large question mark in the center, set against a blue sky background. The text "Data publication - pros and cons?" is overlaid on the sign.

Data publication - pros and cons?



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Picture:
[Colin Kinner \(Flickr: Question mark sign\) \[CC-BY-2.0\]](#), via Wikimedia Commons

Data publication



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Contra

- My data are neither useful nor interesting for others.
- I want to publish my results first, before someone else uses my data.
- There is no time and no money for data processing and curation.
- My data contain personal data – personal rights, difficult search for test persons, anonymising impossible.
- My data include copyrighted material.
- My funder has no interest in making the data publicly accessible.
- My data will not be understood or will be misunderstood. People will bother me with emails.
- There is no incentive. Why should I do all the work?



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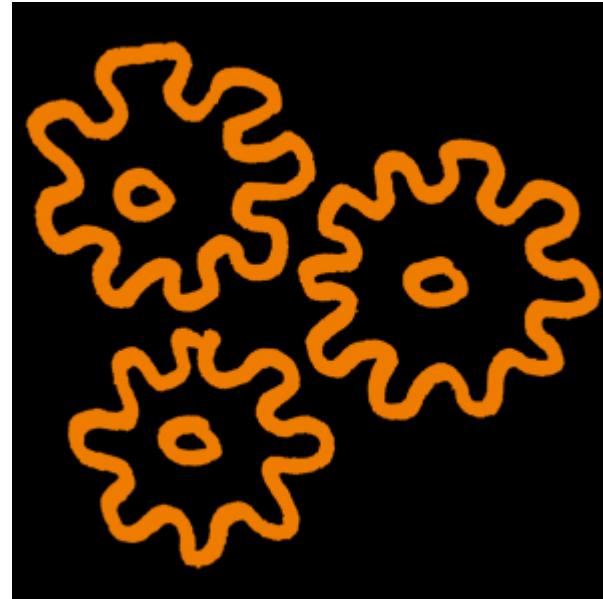
Pro

- Visibility and the accompanying scientific reputation
- Transparency and verifiability of research results
- Possibility of reuse of data in new contexts, for different problems in combination with other data and in interdisciplinary contexts
- New research possibilities through the “Data Web”
- Increased visibility of publications: Papers accompanied by research data are cited more often. See Piwowar, Day & Fridsma (2007), Piwowar & Vision (2013), Belter (2014), Henneken & Accomazzi (2011)
- Avoid duplicate work by reusing research data from third parties.
- Availability of negative results
- Fulfil requirements concerning the accessibility of research material as demanded by funders like DFG and EU, as well as scientific journals.
- Faster and more efficient circulation of knowledge
- Right of access to publicly funded results



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Data Handling Storage & Archiving – some practical issues....



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A STORY TOLD IN FILE NAMES:

Filename	Date Modified	Size	Type
data_2010.05.28_test.dat	3:37 PM 5/28/2010	420 KB	DAT file
data_2010.05.28_re-test.dat	4:29 PM 5/28/2010	421 KB	DAT file
data_2010.05.28_re-re-test.dat	5:43 PM 5/28/2010	420 KB	DAT file
data_2010.05.28_calibrate.dat	7:17 PM 5/28/2010	1,256 KB	DAT file
data_2010.05.28_huh??.dat	7:20 PM 5/28/2010	30 KB	DAT file
data_2010.05.28_WTF.dat	9:58 PM 5/28/2010	30 KB	DAT file
data_2010.05.29_aaarrgh.dat	12:37 AM 5/29/2010	30 KB	DAT file
data_2010.05.29_#\$@*!&!.dat	2:40 AM 5/29/2010	0 KB	DAT file
data_2010.05.29_crap.dat	3:22 AM 5/29/2010	437 KB	DAT file
data_2010.05.29_notbad.dat	4:16 AM 5/29/2010	670 KB	DAT file
data_2010.05.29_woohoo!.dat	4:47 AM 5/29/2010	1,349 KB	DAT file
data_2010.05.29_USETHISONE.dat	5:08 AM 5/29/2010	2,894 KB	DAT file
analysis_graphs.xls	7:13 AM 5/29/2010	455 KB	XLS file
ThesisOutline.doc	7:26 AM 5/29/2010	38 KB	DOC file
Notes_Meeting_with_ProfSmith.txt	11:38 AM 5/29/2010	1,673 KB	TXT file
JUNK...	2:45 PM 5/29/2010		Folder
data_2010.05.30_startingover.dat	8:37 AM 5/30/2010	420 KB	DAT file

Type: Ph.D Thesis Modified: too many times

Copyright: Jorge Cham

www.phdcomics.com

Data Handling Storage & Archiving

Helpful
Tips

File handling

- Data best practices (file naming, formats, versioning,...):
<https://guides.library.stanford.edu/data-best-practices/>
- Make different versions of data distinguishable. Conventions for file naming – for you and in your research group.
- File names should deliver context. Distinguish a file from similar but different datasets and from different versions of the same dataset.
- Files may leave their folders. File names should be unique and descriptive without a directory structure.
- **Never delete your raw data!**
- But delete versions of processed data you do not need any longer.



Data Storage & Archiving – some practical issues....



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Backup

— 3 — ... 2 ... 1 ... Backup!

- At least 3 copies per file...
- ...on at least 2 different media...
- and 1 at a different spatial location.



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EXTERNAL REQUIREMENTS & POLICIES



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Picture: <https://www.flickr.com/photos/raummaschine/9214045295/>

Policies & external requirements



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SATZUNG ZUR SICHERUNG GUTER WISSENSCHAFTLICHER PRAXIS UND ZUM UMGANG MIT WISSENSCHAFTLICHEM FEHLVERHALTEN

in der Fassung vom 28.09.2021

Präambel

Zur Wahrnehmung ihrer Verantwortung in den drei Handlungsfeldern Forschung, Studium und Lehre sowie Wissenstransfer trifft die Universität Heidelberg im gesetzlichen Rahmen Vorehrungen zur Verankerung einer Kultur der guten wissenschaftlichen Praxis. Der Senat hat deshalb in seiner Sitzung vom 28.09.2021 gemäß § 3 Abs. 5 S. 4 LHG i.V.m. § 19 Abs. 1 S. 2 Nr. 10 LHG die folgenden Regelungen beschlossen, durch die die Leitlinien zur Sicherung guter wissenschaftlicher Praxis der Deutschen Forschungsgemeinschaft (DFG) vom August 2019 rechtsverbindlich umgesetzt werden:



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Policies & external requirements



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Heidelberg University

[Rules for safeguarding good academic practice and handling academic misconduct](#)

§ 10 Documentation

- (1) Researchers must document all information relevant to the establishment of a research result with the degree of transparency that is required and appropriate in the respective field. The same applies to individual results that do not support the research hypothesis. There must be no selection of results in such cases. Where research software is developed, the source code must be documented.
- (2) The information required to understand the research, in particular research data and methodological, evaluation and analysis steps, is recorded. Third parties are to be given access to this information where this is possible.



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[Rules for safeguarding good academic practice and handling academic misconduct](#)

§ 11 Public access to research findings

“Researchers decide on their own responsibility whether, how and where to make their research findings publicly available. If they decide to publish their results, the data and principal materials upon which the published work is based must be stored in recognised archives and repositories where this is possible. The provisions of § 14 must be observed.”



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[Rules for safeguarding good academic practice and handling academic misconduct](#)

§ 16 Archiving

“(1) Once they have been made publicly available, research data and findings, and particularly the materials on which they are based, as well as the instruments and, where applicable, the research software used, must be backed up by adequate means according to the standards of the respective field and stored for the legally required time period (usually ten years). A shortening of this storage period must be justified. The storage period begins when the materials are first made publicly available.

(2) The materials are archived a) in the researchers' home institution or b) in repositories serving several locations. In case a) the university will provide the necessary infrastructure for archiving. The selected publication medium must make reference to the archiving location in an appropriate manner.”



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RESEARCH DATA POLICY

RICHTLINIEN FÜR DAS MANAGEMENT VON FORSCHUNGSDATEN

Die Verfügbarkeit von Forschungsdaten ist die Gewähr für die Nachvollziehbarkeit und Überprüfbarkeit sowie die weitergehende Nutzung nach der Veröffentlichung. Sie ist ein zentraler Aspekt guter wissenschaftlicher Praxis der Universität. Ihr Management nach höchsten Standards baut auf diesem Prinzip auf und ist Teil der Exzellenzstrategie.

1. Die Verantwortlichkeit für den Lebenszyklus(*) von Forschungsdaten, insbesondere die Sicherstellung und Bereitstellung der Forschungsdaten zur langfristigen Archivierung liegt primär beim Projektverantwortlichen (PI).
2. Teil jedes Forschungsprojektes ist ein Plan für das Datenmanagement, der explizit adressiert, wie die Akkuratheit, Vollständigkeit, Authentizität, Integrität, Vertraulichkeit, Veröffentlichung und der offene Zugang von Daten gehandhabt werden. Dabei werden fachspezifische Besonderheiten berücksichtigt.
3. Die Universität unterstützt nach bestem Vermögen die PIs durch ein Kompetenzzentrum Forschungsdaten. Es bietet Beratung und Unterstützung bei der Entwicklung von Konzepten für ihr Datenmanagement an. Dafür ist eine frühzeitige Kontaktaufnahme vor oder zu Projektbeginn erforderlich.
4. Der Plan für das Management von Forschungsdaten stellt den Zugriff und die Nutzung unter Einhaltung von ethischen und Open Access-Prinzipien unter geeigneten Sicherheitsmaßnahmen sicher. Der Open-Access-Policy der Universität folgend ermuntert die Universitätsleitung Wissenschaftler ausdrücklich, Forschungsdaten gemäß der Grundsätze von Open Access, wie sie in der „Berliner Erklärung über offenen Zugang zu wissenschaftlichem Wissen“ von 2003 beschrieben sind, zugänglich zu machen, solange keine entgegenstehenden rechtlichen Verpflichtungen bestehen (insb. Verträge mit Verlagen). Für Daten, die Grundlage von schutzhfähigen, geistigem Eigentum sind, gilt grundsätzlich die Verpflichtung zur Einreichung einer Erfindungsmeldung gemäß Arbeitnehmererfindungsgesetz (§§ 5, 42 Nr. 2) und die IP-Policy der Universität Heidelberg vorrangig.
5. Die persönlichen Daten von Probanden, Patienten und anderen von Datenerhebungen betroffenen Personen werden gemäß den Datenschutzrichtlinien geschützt.
6. Daten, die außerhalb der Universität als Teil des Datenmanagementplans bereithalten werden, sollten beim Kompetenzzentrum Forschungsdaten registriert werden. Das Kompetenzzentrum Forschungsdaten bietet eine Datenregistrierung an, die Datensätze sowohl aus universitären als auch externen Repositorien nachweist.
7. Alle Rechte an Daten, insbesondere das Recht, die Daten weitergehend zu nutzen oder zu publizieren, sollten den PIs vorbehalten sein und nicht an Dritte vergeben werden.



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Policies & external requirements

RESEARCH DATA POLICY

RICHTLINIEN FÜR DAS MANAGEMENT VON FORSCHUNGSDATEN

Seven paragraphs

Paragraf 1: Die Verantwortung für Forschungsdaten ist die Gewähr für die Nachvollziehbarkeit und Überprüfbarkeit sowie die weitergehende Nutzung nach der Veröffentlichung. Sie ist ein zentraler Aspekt guter wissenschaftlicher Praxis der Universität. Ihr Management nach höchsten Standards baut auf diesem Prinzip auf und ist Teil der

- 1) PI's are responsible for the whole research data lifecycle.
- 2) Every research project should develop a data management plan.
- 3) University offers support via the Research Data Unit.
- 4) University encourages researcher to publish open access if possible.
- 5) Importance of data privacy.
- 6) Data published outside of the university's webspace should be registered at the RDU.
- 7) PI's shall keep their right on data use and publication and shall not transfer it to third parties.

[Research Data Policy - Universität Heidelberg \(uni-heidelberg.de\)](http://www.uni-heidelberg.de/research-data-unit/research-data-policy.html)

nachweist.

7. Alle Rechte an Daten, insbesondere das Recht, die Daten weitergehend zu nutzen oder zu publizieren, sollten den PIs vorbehalten sein und nicht an Dritte vergeben werden.



Funders are pushing RDM & Open Data



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DFG Guidelines on the Handling of Research Data

[...] For this reason, the handling of research data and the objects on which the data is based have to be carefully planned, documented and described. Wherever possible it is important to enable subsequent use of the research data and potentially also the objects by other users.

[...]

For this reason, the DFG expects research projects to include a description of how research data is handled. The description should be based on the checklist for handling research data

[...]

Costs incurred for the project-specific handling of research data should be requested in connection with the project.[...]"



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Checklist Regarding the Handling of Research Data

1. Data description

How does your project generate new data? Is existing data reused? Which data types (in terms of data formats like image data, text data or measurement data) arise in your project and in what way are they further processed? To what extent do these arise or what is the anticipated data volume?

2. Documentation and data quality

What approaches are being taken to describe the data in a comprehensible manner (such as the use of available metadata, documentation standards or ontologies)? What measures are being adopted to ensure high data quality? Are quality controls in place and if so, how do they operate? Which digital methods and tools (e.g. software) are required to use the data?

3. Storage and technical archiving the project

How is the data to be stored and archived throughout the project duration? What is in



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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.“
- http://www.dfg.de/foerderung/antrag_gutachter_gremien/antragstellende/nachnutzung_forschungsdaten/
- [Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020](#) | [Guidelines on Data Management in Horizon 2020](#)



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1. Data Summary

What is the purpose of the data collection/generation and its relation to the objectives of the project?

What types and formats of data will the project generate/collect?

Will you re-use any existing data and how?

What is the origin of the data?

What is the expected size of the data?

To whom might it be useful ('data utility')?

2. FAIR data

2. 1. Making data findable, including provisions for metadata

Are the data produced and/or used in the project discoverable with metadata, identifiable and locatable by means of a standard identification mechanism (e.g. persistent and unique identifiers such as Digital Object Identifiers)?

What naming conventions do you follow?

Will search keywords be provided that optimize possibilities for re-use?



Journals: Nature

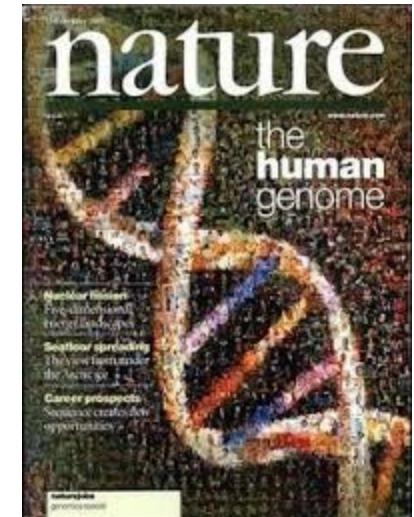


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An inherent principle of publication is that others should be able to replicate and build upon the authors' published claims. A condition of publication in a Nature Portfolio journal is that **authors are required to make materials, data, code, and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

[...]Providing large datasets in supplementary information is strongly discouraged and the preferred approach is to make data available in repositories.

<https://www.nature.com/nature-portfolio/editorial-policies/reporting-standards#availability-of-data>



<https://www.nature.com/sdata/policies/repositories>



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Journals: PLOS



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Data Availability

PLOS journals require authors to make all data necessary to replicate their study's findings publicly available without restriction at the time of publication. When specific legal or ethical restrictions prohibit public sharing of a data set, authors must indicate how others may obtain access to the data.

[...]

Publication is conditional on compliance with this policy. If restrictions on access to data come to light after publication, we reserve the right to post a Correction, an Editorial Expression of Concern, contact the authors' institutions and funders, or, in extreme cases, retract the publication. [...]



<https://journals.plos.org/plosone/s/data-availability>



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LEGAL ISSUES



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Legal issues



Research data and copyright

- Textual data typically are protected by copyright
- Copyright holder can grant simple or exclusive usage rights
- For publications in subscription journals: typically unlimited and irrevocable transfer of rights to the publishers
- Research data? Facts like measurements generally do not reach the threshold of originality, even though the data collection can be very sophisticated.
- Therefore: According to German copyright law, research data are in many cases not copyrighted.
- But many data are in databases and there is some kind of protection for these (EU directive 96/09/EG, UrhG §§ 87a-e). Virtually all data are useless without documentation. This documentation might very well be protected by copyright.



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Legal issues



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Creative Commons Licences

- Standard licences that determine the scope of use of a work
- Combination of layperson-friendly formulation and a legally proper license text adapted to the relevant national law.
- Licence content and metadata are available in machine readable form and can be added to a document. (□ TDM)
- Modular structure with differing “degrees of freedom”
- There are also alternatives, e.g. the Open Data Commons licenses.
- For Software there are specific software licenses

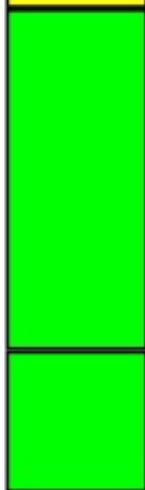
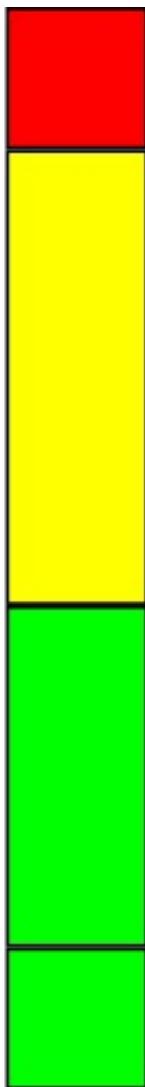


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Legal issues



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Legal issues

Data publication and data protection

- Informed consent: data sharing not excluded; information on whether and how data are disseminated

Beispiel UK Data Archive „Managing and Sharing Data“: SAMPLE CONSENT FORM FOR INTERVIEWS

CONSENT FORM FOR [NAME OF PROJECT]	
Please tick the appropriate boxes	
Yes No	
Use of the information I provide for this project only	
I understand my personal details such as phone number and address will not be revealed to people outside the project.	<input type="checkbox"/> <input type="checkbox"/>
I understand that my words may be quoted in publications, reports, web pages, and other research outputs.	<input type="checkbox"/> <input type="checkbox"/>
Use of the information I provide beyond this project	
I agree for the data I provide to be archived at the UK Data Archive. ^b	<input type="checkbox"/> <input type="checkbox"/>
I understand that other genuine researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/> <input type="checkbox"/>
I understand that other genuine researchers may use my words in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/> <input type="checkbox"/>



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Thank you very much!

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Research Data Unit
<https://data.uni-heidelberg.de/>

General Information on RDM
<https://www.forschungsdaten.info/>



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