Data Archiving and Networked Services
DANS

“Module data sharing, archiving and publishing”

An introduction….

Cees H.J. Hof
Data Archiving and Networked Services (DANS-KNAW)
With the help of Jasmin Böhmer (UMCU) & Christine Staiger (DTL)

@CeesH_DANS

29 MAY 2019, Helis Academy, FAIR Data Stewardship Course

Darwin Incubator, Niel, Belgium

About your trainer…..

- At DANS:
  - Project acquisition
  - Liaison life sciences
  - European Open Science Cloud (EOSC)
  - Software sustainability
  - Coach "Essentials 4 Data Support"

- +10 years involved in development of Global Biodiversity Information System (GBIF)
  - FAIR data *avant la lettre*
  - Cataloguing biodiversity data
  - Developing and implementing the DarwinCore data standard
  - Community building

www.gbif.org

- Background in Biology (ecology, taxonomy & paleontology)

DANS is about keeping data FAIR

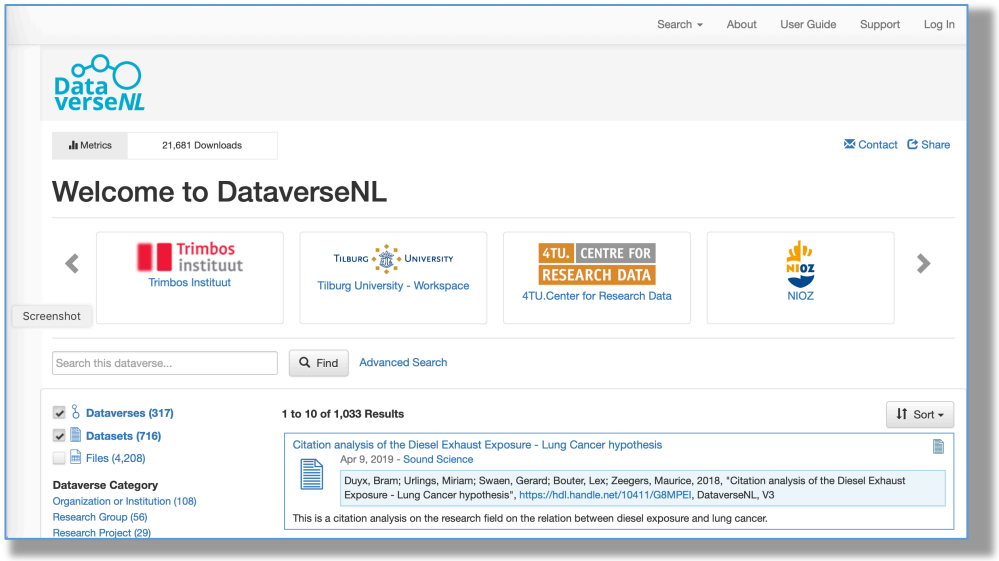
Mission: promote and provide permanent access to digital research resources

Institute of Dutch Academy and Research Funding Organisation (KNAW & NWO) since 2005

First predecessor dates back to 1964 (Steinmetz Foundation), Historical Data Archive 1989

About DANS core services

DataverseNL



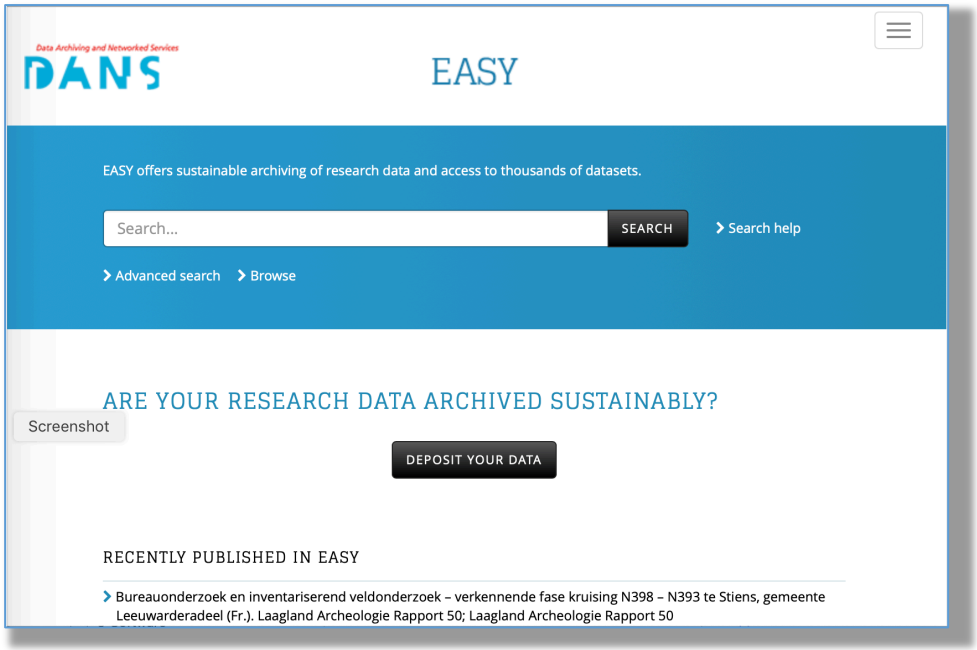
For RDM in ongoing research

- **Including short / intermediate term storage**
- **Discipline agnostic**
- **14 organisations participating**
- **DANS only technical maintenance and support**
- **Ongoing development**

https://dataverse.nl

About DANS core services

EASY



For long term storage

- **Certified according to Core Trust Seal**
- **Discipline agnostic**
- **Biased towards humanities – social sciences – life sciences**
- **> 80.000 datasets**
- **Team of data custodians**
- **Below 1 TB free service**
- **Ongoing developments**

https://easy.dans.knaw.nl/

About DANS core services

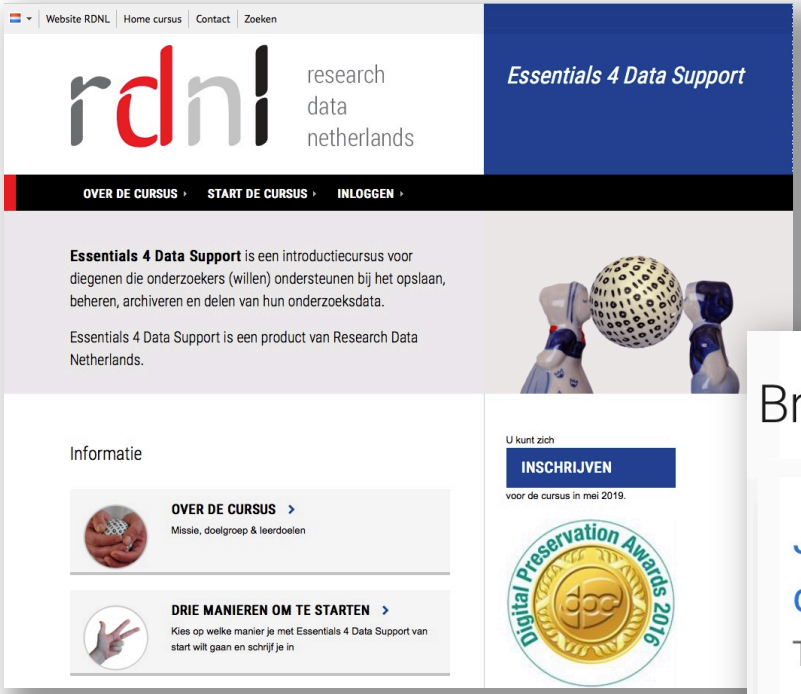
NARCIS

https://www.narcis.nl/

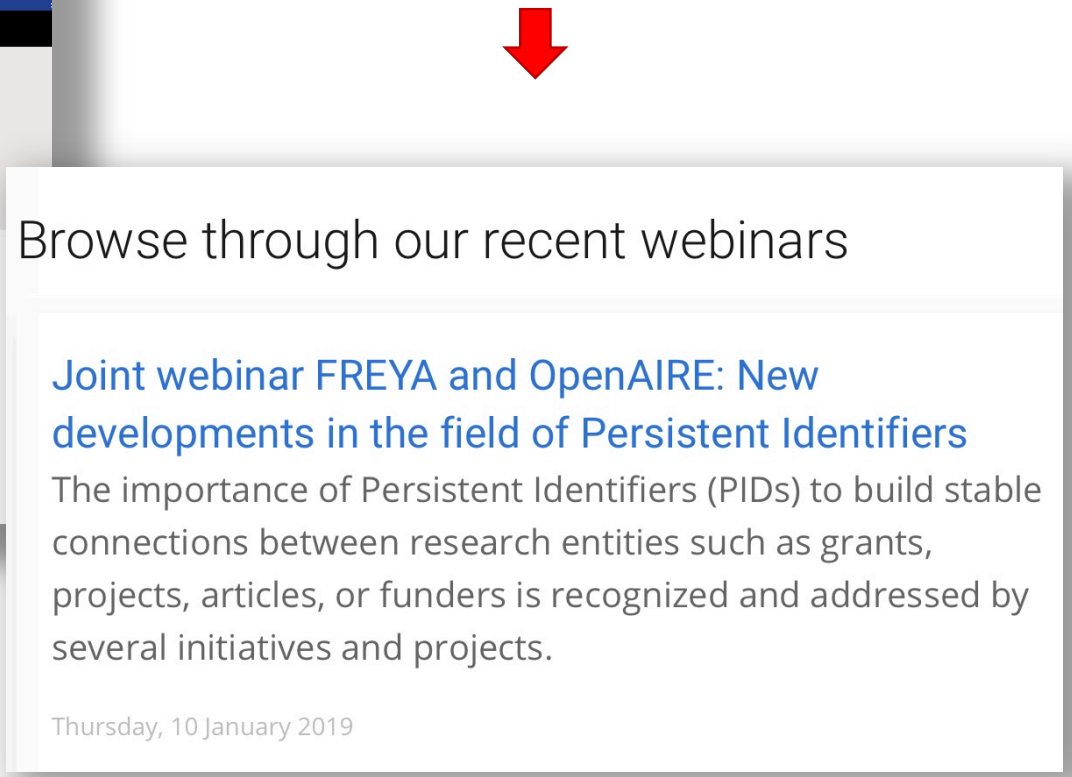
Gateway to scholarly information in the Netherlands

- **Metadata only**
- **Around 2 million publications**
- **More than 200.000 datasets**
- **Tool to monitor research output**
- **Harvesting info from local cris databases**
- **Using OAI-PMH protocol**
- **DublinCore and DataCite as main standards**
- **Providing metadata to European and international networks**

RDM training by DANS



In the context of many H2020 projects…



At the national level…

Objectives of this module:

Basic knowledge of:

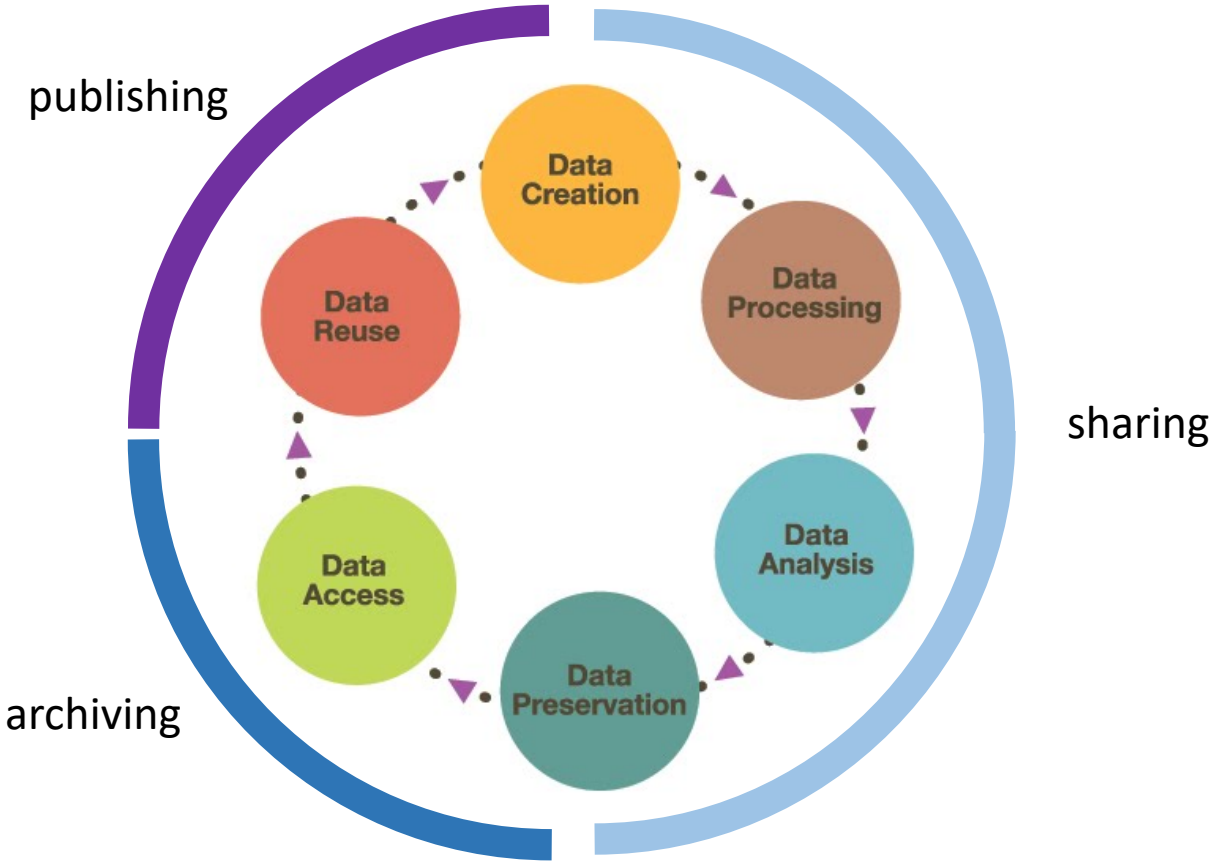
- Know what a repository is
- Characteristics of Data Sharing, Archiving and Publishing
- Knowledge of major platforms for Sharing, Archiving and Publishing
- ….

Hands on experience:

- Dataverse possibilities for sharing and publishing
- Designing requirements digital archives
- Finding your ideal archive
- A bit of FAIR assessment….. (if time allows)

Terminology….

Sharing versus archiving versus publishing…



Sharing

Tools to store and share data

- Dropbox, Google Drive, GitHub (commercial), DataVerse, Figshare
- B2SHARE (EUDAT)
- Owncloud-based services: SURFdrive, Research Drive (national NL)
- A-Z drives for Windows (institutional)

Characteristics:

→ Storing active data

→ Data can be easily changed

→ Some tools do have a versioning policy

→ Data sharing main purpose

Sharing

how do these services work?

Access by filesystem Mounts:

- Data lies on server
- Extra folder on computer
- Synchronisation
- Upload by adding files

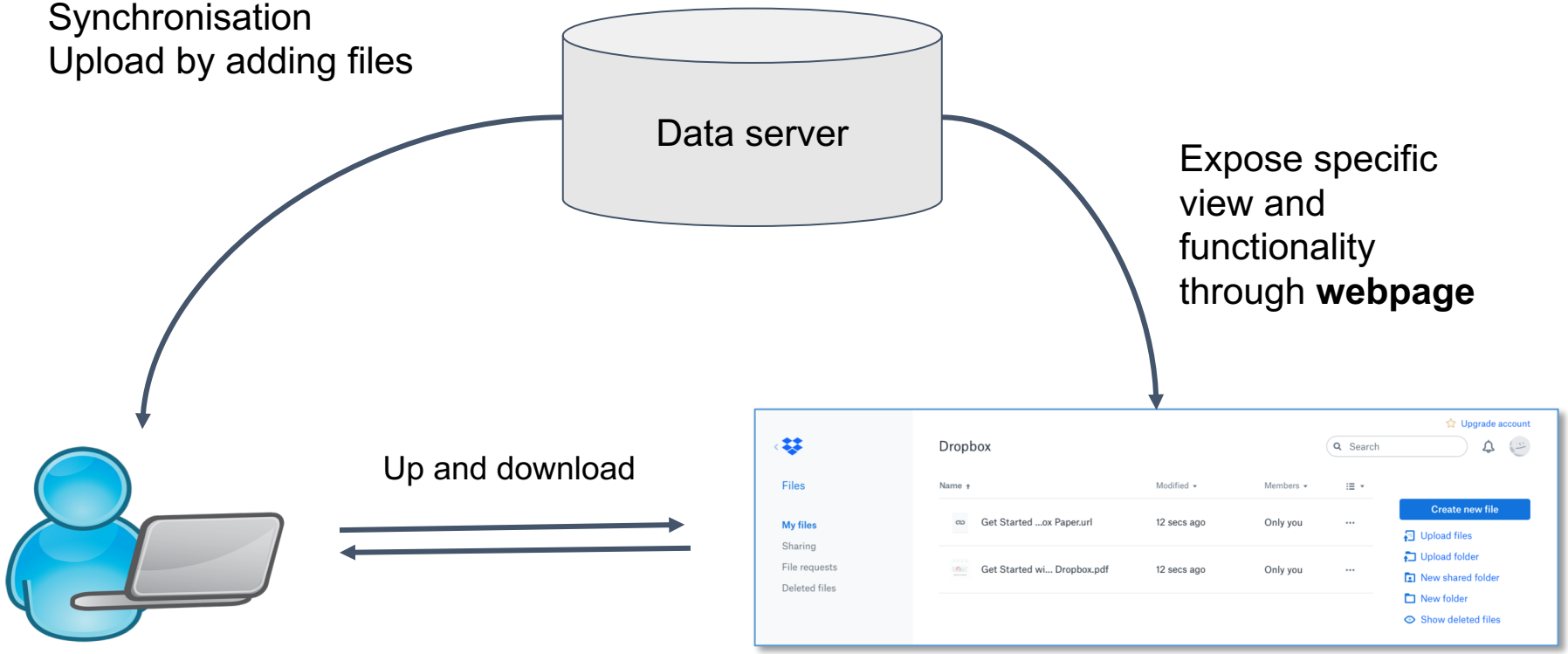


Illustration by Jasmin Böhmer & Christine Staiger

Sharing

- Data owner (researcher) has full command
  - Decides with whom to share
  - Can revoke access
  - Can delete data

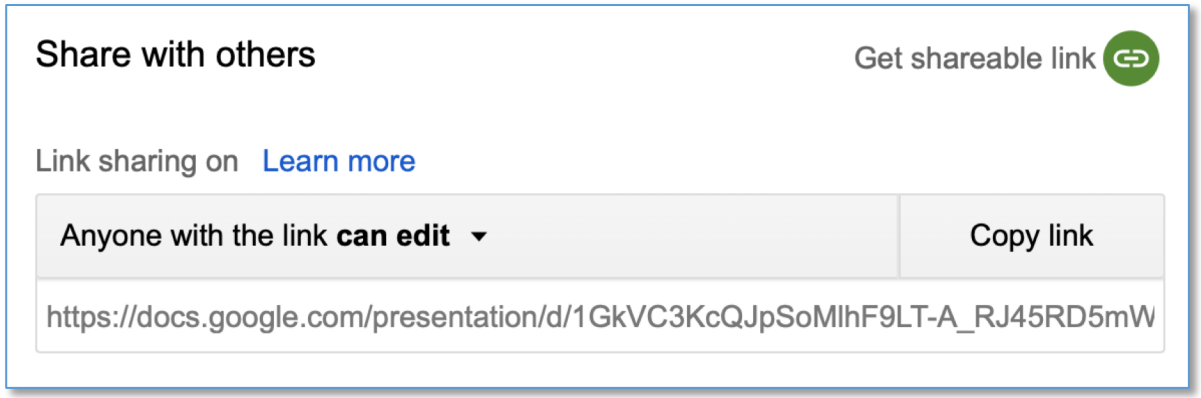
→ Huge flexibility

→ No extra security through third person, **risk!**

Sharing

Ways of sharing data

-Shareable link



-Dedicated access list

When would you use what?

Sharing

Pros & Cons

Shareable link

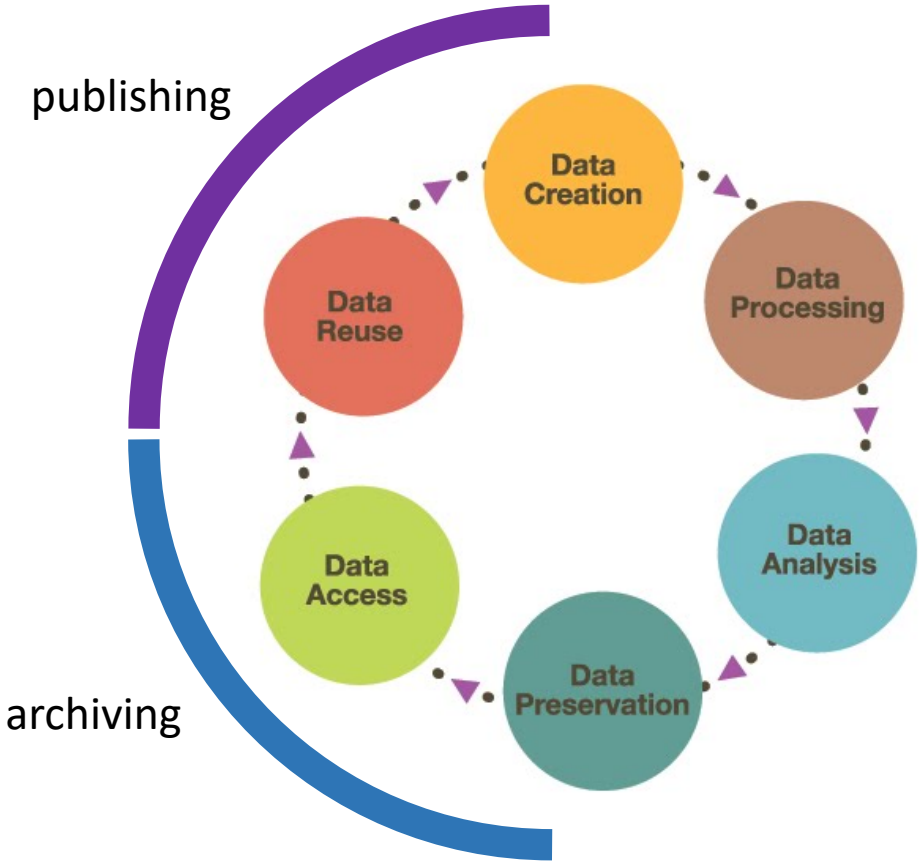
+ Anyone can access the data
+ No need for extra account for collaborators
- Link offers only one granularity of access (read, edit, comment ...)
- Link can be spread further without authors knowledge
- Revoking link revokes access to all collaborators

Dedicated access list

+ Access level can be set per collaborator
+ Access can be revoked for group or individual
+ Data cannot be shared without consent by author
- Every collaborator needs have an account on that system

Terminology….

Sharing versus archiving versus publishing…



Publishing and Archiving

Essential difference:

Publishing: Focus on visibility and accessibility of data and information.

Archiving: Focus on long term preservation and retrievable data and information.

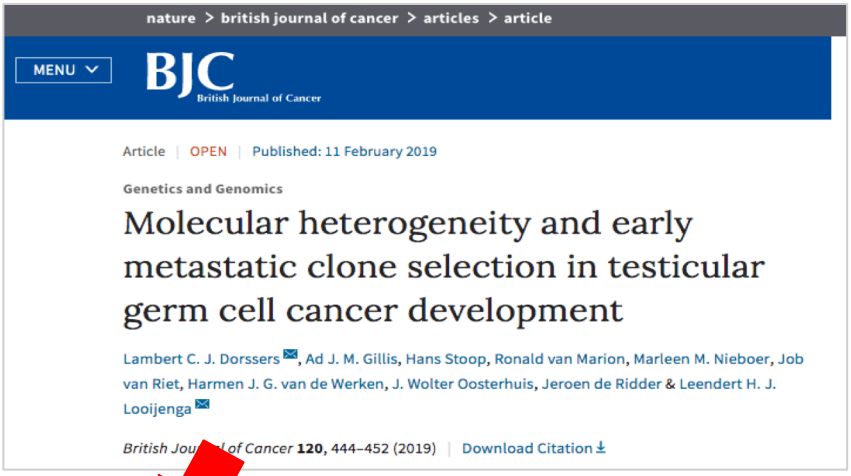
Publishing formats

Data Publishing

- As supplementary data to a publication (no DOI)
- On a project website (no enough metadata)
- Via a standardised data archive (certified and curation workflow) (ideal)
- Via a domain specific data repository (self publishing, no curation workflow) (possible)
- Data paper
- Combinations

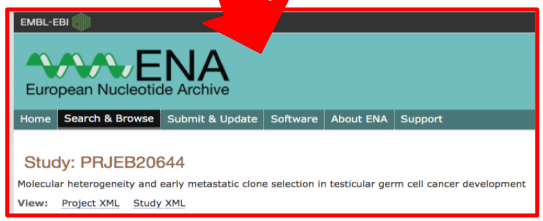
Data publishing examples

As **supplementary** data to a publication (no DOI)



Data availability

WGS, ENA PRJEB20644, accession numbers ERX2100523–530; targeted sequencing, ENA PRJEB20644, accession numbers: ERX2019898–958; RNAseq, ArrayExpress, accession number: E-MTAB-5746; DNA methylation, GEO (GSE58538, GSM1413103–GSM1413106) or ArrayExpress (E-MTAB-5842, sample T6107-YSTmeta).



Paper: https://www.nature.com/articles/s41416-019-0381-1
Data: https://www.ebi.ac.uk/ena/data/view/PRJEB20644

Data publishing examples

On a **project website** (not enough metadata)

Dr. Javier Alonso-Mora, Assistant Professor

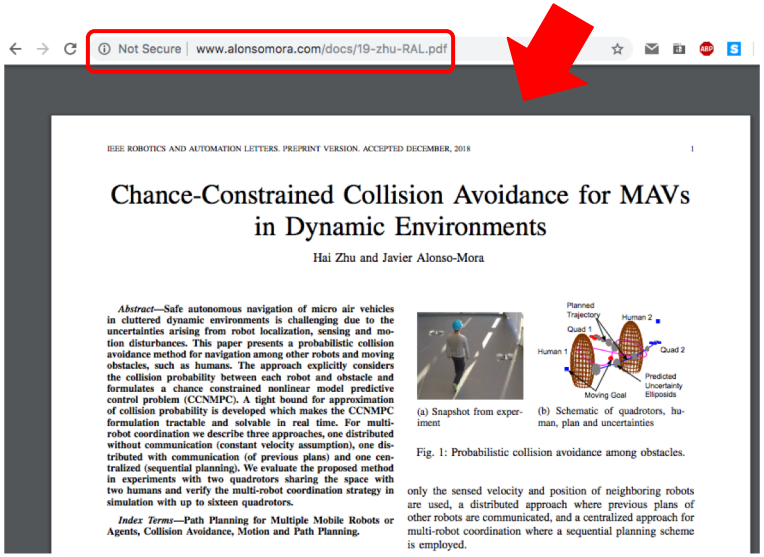
Autonomous Multi-Robots Lab. Delft University of Technology

Home | Research | Team | Publications | Teaching | Videos and Media | Bio & Contact |

A complete list of my publications is available in my Google Scholar profile.

Journals

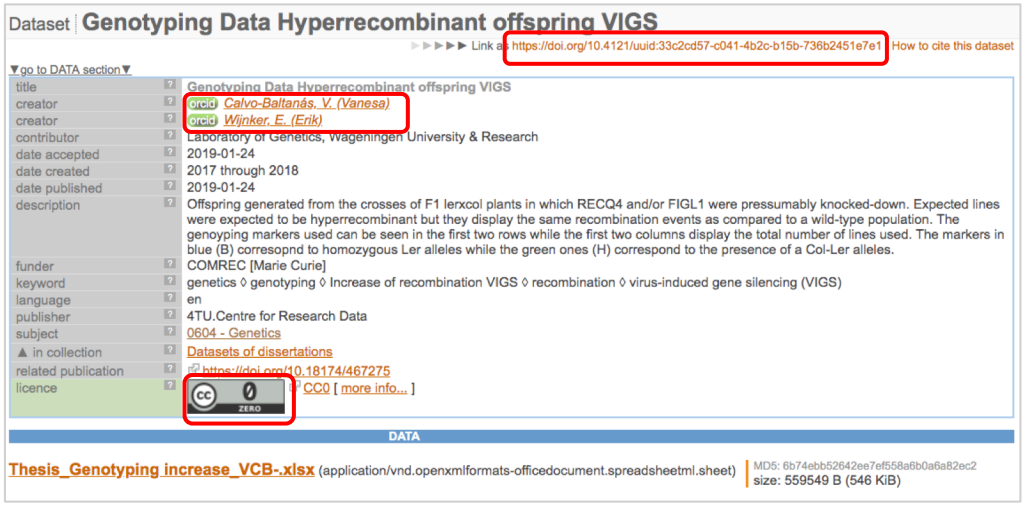
(J18) H. Zhu and J. Alonso-Mora, **"Chance-constrained Collision Avoidance for MAVs in dynamic environments"**, in IEEE Robotics and Automation Letters (RA-L), Jan. 2019. [PDF] [video]



Website: http://www.alonsomora.com/publications.html
PDF: http://www.alonsomora.com/docs/19-zhu-RAL.pdf

Data publishing examples

Via a standardised **data archive** (certified and curation workflow)



Dataset | **Genotyping Data Hyperrecombinant offspring VIGS**

Link as https://doi.org/10.4121/uuid:33c2cd57-c041-4b2c-b15b-736b2451e7e1 | How to cite this dataset

▼go to DATA section▼

title	Genotyping Data Hyperrecombinant offspring VIGS
creator	Calvo-Baltanás, V. (Vanesa)
creator	Wijnker, E. (Erik)
contributor	Laboratory of Genetics, Wageningen University & Research
date accepted	2019-01-24
date created	2017 through 2018
date published	2019-01-24
description	Offspring generated from the crosses of F1 lerxcol plants in which RECQ4 and/or FIGL1 were pressumably knocked-down. Expected lines were expected to be hyperrecombinant but they display the same recombination events as compared to a wild-type population. The genoyping markers used can be seen in the first two rows while the first two columns display the total number of lines used. The markers in blue (B) corresopnd to homozygous Ler alleles while the green ones (H) correspond to the presence of a Col-Ler alleles.
funder	COMREC [Marie Curie]
keyword	genetics ◊ genotyping ◊ Increase of recombination VIGS ◊ recombination ◊ virus-induced gene silencing (VIGS)
language	en
publisher	4TU.Centre for Research Data
subject	0604 - Genetics
▲ in collection	Datasets of dissertations
related publication	https://doi.org/10.18174/467275
licence	CC0 [more info...]

DATA

Thesis_Genotyping increase_VCB-.xlsx (application/vnd.openxmlformats-officedocument.spreadsheetml.sheet) | MD5: 6b74ebb52642ee7ef558a6b0a6a82ec2 size: 559549 B (546 KiB)

Dataset: https://data.4tu.nl/repository/uuid:33c2cd57-c041-4b2c-b15b-736b2451e7e1

Data publishing examples

April 20, 2018

Software | Open Access

Colour 0.3.13

Mansencal, Thomas; Mauderer, Michael; Parsons, Michael; Canavan, Luke; Cooper, Sean; Shaw, Nick; Wheatley, Kevin; Crowson, Katherine; Lev, Ofek; Leinweber, Katrin; Vandenberg, Jean D.; Sharma, Shriramana

Colour Science for Python

Colour is a Python colour science package implementing a comprehensive number of colour theory transformations and algorithms.

It is open source and freely available under the New BSD License terms.

1,860 views

67 downloads

See more details...

Versions

Version 14	10.5281/zenodo.2647615	Apr 20, 2018
Version 13	10.5281/zenodo.2604314	Mar 19, 2018
Version 12	10.5281/zenodo.1175177	Feb 18, 2018
Version 11	10.5281/zenodo.821825	Jul 12, 2017
Version 10	10.5281/zenodo.376790	Mar 12, 2017

View all 14 versions

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.605791. This DOI represents all versions, and will always resolve to the latest one. Read more.

Publication date:
April 20, 2018

DOI:
DOI 10.5281/zenodo.2647615

Keyword(s):
API | Blackbody | Characterisation | Chromatic Adaptation | Colorimetry | Colour | Colour Appearance Model | Colour Difference | Colour Matching Functions | Colour Model | Colour Notation System | Colour Quality | Colour Rendition Chart | Colour Science | Correlated Colour Temperature | Illuminants | Lightness | Luminance | Luminous Efficiency Function | Open Source | Optical Phenomenon | Photometry | Planckian Radiator | Python | Reflectance Recovery | Spectrum | Tristimulus Values | Whiteness

Grants:
European Commission:
- DEEPVIEW - GAZE-BASED PERCEPTUAL AUGMENTATION (303780)

Related identifiers:
Cites:
https://github.com/colour-science/colour/blob/develop/BIBLIOGRAPHY.rst

Communities:
European Commission Funded Research (OpenAIRE)
Zenodo

License (for files):
BSD 3-Clause "New" or "Revised" License

Via standardised **data repository** (self publishing, no curation workflow)

Dataset: https://zenodo.org/record/2647615#.XNLhttMzZN0

Data publishing examples

Data Paper
E.g. Data in Brief by ScienceDirect (Elsevier)

ELSEVIER

Data in Brief
Volume 7, June 2016, Pages 1451-1454

Journal Data in Brief

Data Article

Hand measurement data from human babies at birth, from 26 to 41 weeks estimated gestational age

Emmanuelle Honoré [a, b, d], Thameur Rakza [c], Philippe Deruelle [c]

Show more

https://doi.org/10.1016/j.dib.2016.03.089

Refers to Emmanuelle Honoré, Thameur Rakza, Brigitte Senut, Philippe Deruelle, Emmanuelle Pouydebat
First identification of non-human stencil hands at Wadi Sūra II (Egypt): A morphometric study f...
Journal of Archaeological Science: Reports, Volume 6, April 2016, Pages 242-247

Download PDF

Specifications table

Subject area	*Biology*
More specific subject area	*Biometry*
Type of data	*Table*
How data was acquired	*Medical caliper*
Data format	*Raw*
Experimental factors	*Measurements were taken directly on hands with a medical caliper.*
Experimental features	*Measurements were taken in the first week of life.*
Data source location	*Neonatalogy Unit, CHRU Jeanne de Flandre (University Hospital), Lille, France*
Data accessibility	*Data is with this article*

1. Data

Two series of measurements taken at birth on the hands of human newborns are displayed: a series from babies born pre-term, from 26 to 36 weeks EGA (Estimated Gestational Age), and a series from babies born at term, from 37 to 41 weeks EGA. Data was collected in the Neonatal Unit of the CHRU Jeanne de Flandre (University Hospital) in Lille, France, from January until May 2014. Seven measurement criteria were selected, concerning either lengths, widths or ray of the hand, the palm and the digits. They are recorded with the EGA, the sex and the weight of the individuals, regardless of the side – right hand or left hand (Tables 1 and 2).

Table 1. Measurement series on the hand of 25 human babies born pre-term (26–36 EGA), in mm.

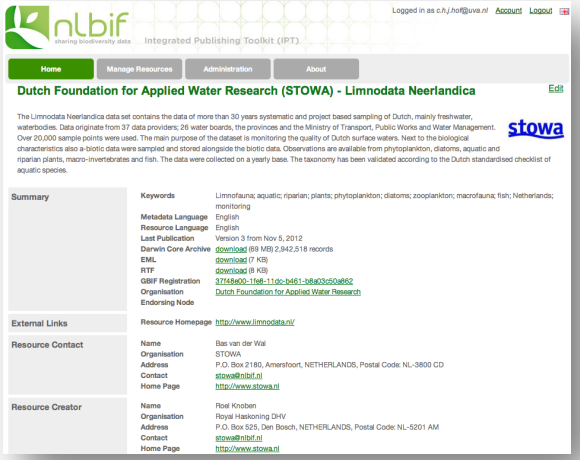
NAME	Surname	Estimated gestational age	Weight	Sex	W_i	W_t	R_t	L_m	L_p	L_h	W_h
RAH	OUN	34	1580	M	6	7.67	24.97	23.39	27.85	51.24	26.93
RAH	KAI	34	2125	M	7.85	7.64	32.01	25.13	31.64	56.77	28.73
KER	YOU	31	1100	M	5.82	6.23	25.8	20.96	29.04	50	23.57

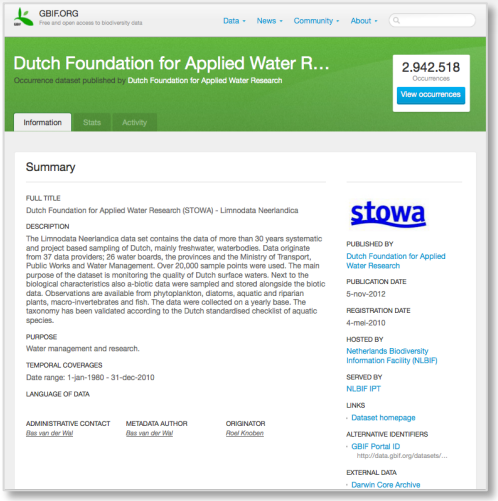
Data in Brief:
https://www.journals.elsevier.com/data-in-brief
Data Paper:
https://www.sciencedirect.com/science/article/pii/S2352340916301974

Data publishing examples

Combined publishing
The GBIF example

Integrated
Publishing
Toolkit

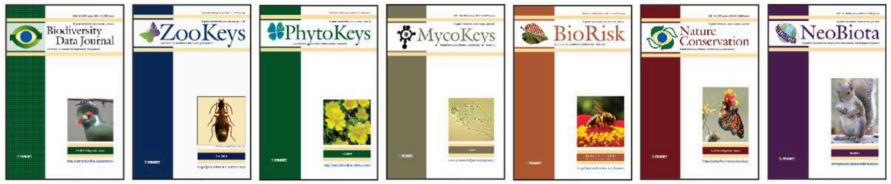




GBIF portal www.gbif.org

Every dataset & search a DOI

Pensoft data papers



With the same toolkit:

- Data online
- Submitting data papers

Data publishing examples

Which way of data publication is your preferred one?

1. Supplementary material to paper
2. Own webserver
3. Certified data repository with review
4. Self-publishing through data repository
5. Peer-reviewed data publication (Data in brief, F1000, …)

Which data publication would you trust?

With which method would you reach the biggest audience?

Terminology….

What is a repository?

Repositories preserve, manage, and provide access to many types of digital materials in a variety of formats. Materials in online repositories are curated to enable search, discovery, and reuse. There must be sufficient control for the digital material to be authentic, reliable, accessible and usable on a continuing basis.

casrai

https://dictionary.casrai.org/

Terminology….

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casrai

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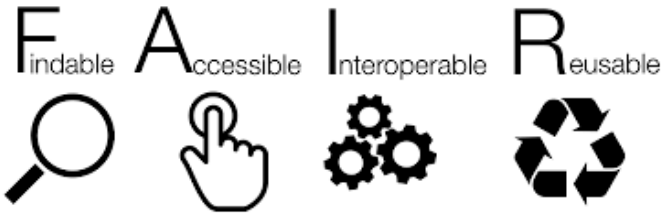
Good repository means FAIR data



Publishing platforms

Overview

Many repositories

- Multi purpose repositories like B2SHARE, public version of Figshare and Zenodo
  - Simple publishing workflow, depositor is responsible for content, quality and metadata of the published data
- Curated repositories like DANS EASY, 4TU Data centre repository, many institutional repositories
  - Depositor sends data over, then data is checked for quality to some extent
- Community-specific repositories like EBI EGA, NCBI GEO, …
  - Expect very specific data formats
  - Have an extended data quality checking pipeline (people try to reproduce the data)

Publishing platforms

Many Repositories - re3data.org

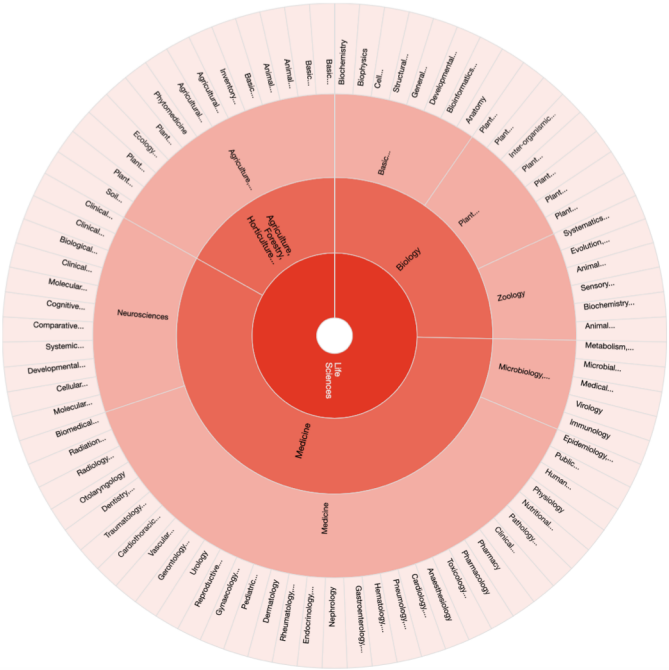
Re3data.org

Over 2300 international repositories for a wide spread of domains

Plentiful filters to find appropriate repositories

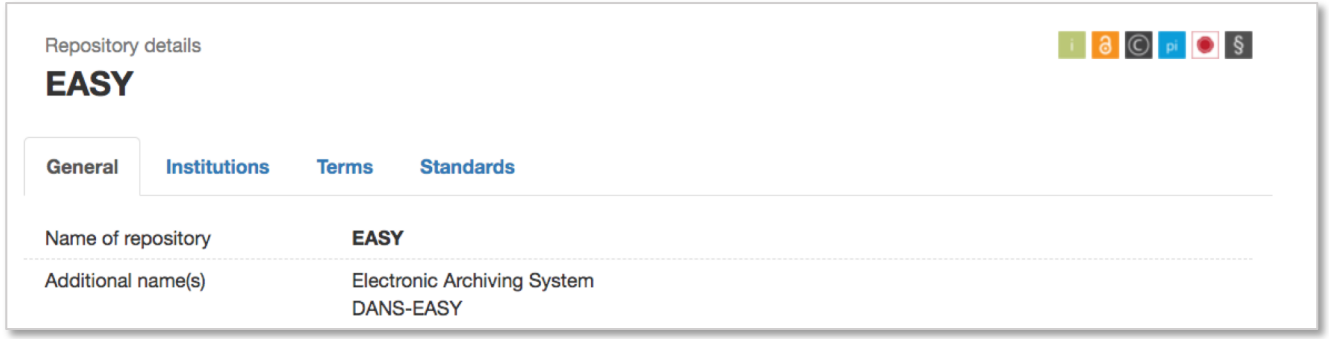
All Categories

Life Science Repositories Categories



Publishing platforms

Many Repositories - re3data.org



Provides overview of

- general information about the individual features,
- institutional characteristics,
- terms of use and
- applied standards

Publishing platforms re3data.org

Example: CERN ZENODO

Type:

General Repository for open source, open access, open data

Publishing Policy:

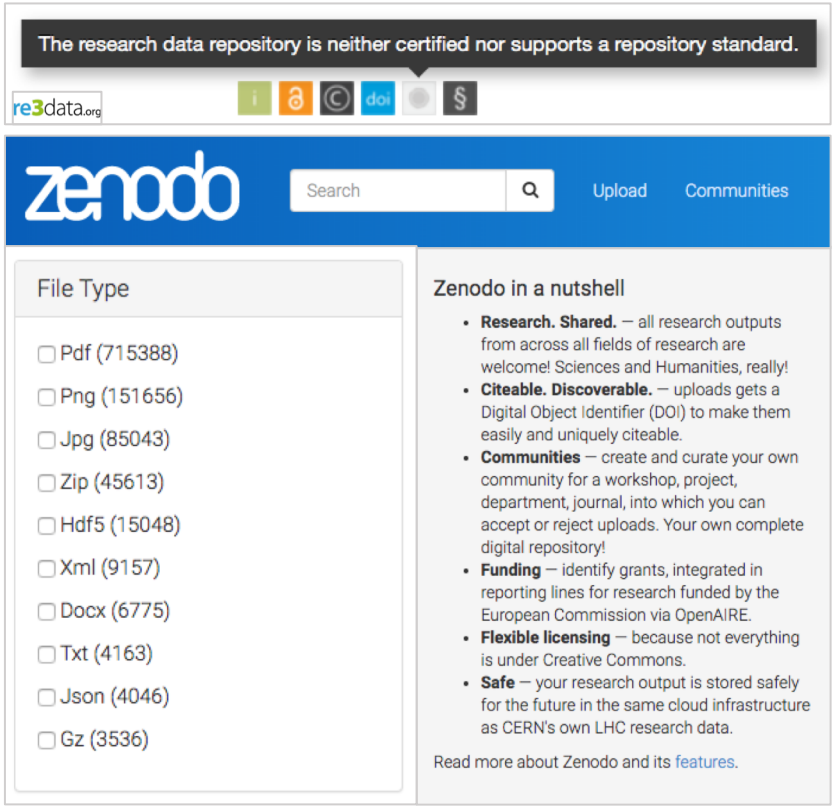
Once it's published the record cannot be deleted; metadata can be adjusted at any time

Advantage:

Quick and independent publishing
Published with one button click
Standardised repository that provided DOI

Disadvantage:

Typos and writing errors are not double checked
Errors and issues on file-level are not detected



Publishing platforms re3data.org

Example: EBI EGA

EUROPEAN GENOME-PHENOME ARCHIVE

Type:

Data Archive for sequence and genotype studies and data

Publishing Policy:

Once it's published the data-set cannot be deleted; Data Access Committee (DAC) controls access

Advantage:

Dedicated domain specific archive for Europe
Secure access control via DAC

Disadvantage:

No persistent link
Elaborate upload process

Dataset ID	Description	Technology	Samples
EGAD00000000001	WTCCC1 project samples from 1958 British Birth Cohort	Affymetrix 500K,unknown	1504
EGAD00000000002	WTCCC1 project samples from UK National Blood Service	Affymetrix 500K,unknown	1500
EGAD00000000003	WTCCC1 project Bipolar Disorder (BD) samples	Affymetrix 500K	1998
EGAD00000000004	WTCCC1 project Coronary Artery Disease (CAD) samples	Affymetrix 500K	1998
EGAD00000000005	WTCCC1 project Inflammatory Bowel Disease (IBD) samples	Affymetrix 500K	2005
EGAD00000000006	WTCCC1 project Hypertension (HT) samples	Affymetrix 500K	2001
EGAD00000000007	WTCCC1 project Rheumatooid arthritis (RA) samples	Affymetrix 500K	1999
EGAD00000000008	WTCCC1 project Type 1 Diabetes (T1D) samples	Affymetrix 500K	2000
EGAD00000000009	WTCCC1 project Type 2 Diabetes (T2D) samples	Affymetrix 500K	1999
EGAD00000000010	WTCCC1 project Ankylosing Spondylitis (AS) samples	Illumina 15K	957

Data Archiving and Networked Services

DANS

Moving to a demo session on Dataverse…..

By Christine Staiger

Cees.Hof@dans.knaw.nl

@CeesH_DANS