

# INTEGRATING PERSISTENT IDENTIFIERS

Jadranka Stojanovski

University of Zadar / Ruđer Bošković Institute

COST Action ENRESSH Training School 2019  
“National bibliographic databases and their uses  
for evaluating and understanding research”  
21–25 October 2019, Poznań, Poland

# In the real world



# In the world of scientific research...

FACULTY/1000 F1000Prime F1000Research F1000Posters Welcome Guest

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**F1000Research** Articles CrossMark Version 2 of 2

**RESEARCH ARTICLE**

**UPDATED**

**Considerations for clinical read alignment and mutational profiling using next-generation sequencing [v2; ref status: indexed, http://f1000r.es/NMpsFc]**

Gavin R Oliver

**Author affiliations**

**Grant information:** The author(s) declared that no grants were involved in supporting this work.

Views 6152 Download As 793 Cite 3

**Open Peer Review**

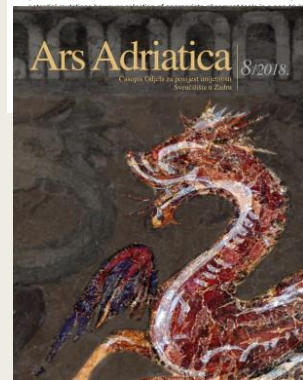
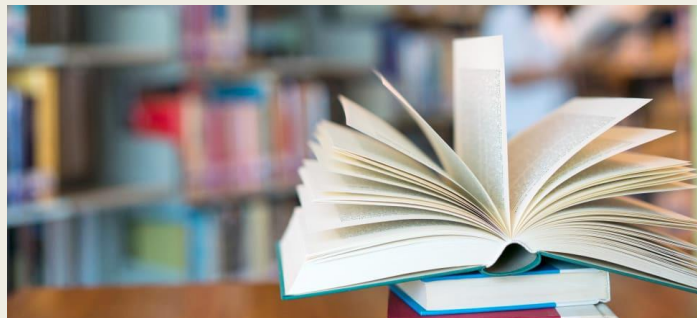
**Invited Referee Responses**

	1	2	3
version 1 published 16 Jul 2012	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
version 2 submitted 20 Sep 2012 (locked)			<input checked="" type="checkbox"/>

- 1 Thomas Friedman, National Institute on Deafness and Other Communication Disorders (NIDCD), National Institutes of Health, USA
- 2 Vera Kalchauer, Max Planck Institute for Molecular Genetics, Germany
- 3 Mihaila Purtes, Johns Hopkins University School of Medicine, USA  
Steven Skitzberg, Johns Hopkins University School of Medicine, USA

**Comments**

No comments | Add Comment



**ARCHAEOLOGIA**  
adriatica

Sveučilište u Zadru / Universitas studiorum Jadertina / University of Zadar  
Odjel za arheologiju / Department of Archaeology / UDK 902/904  
ISSN 1846-4807 / Archaeo. Adriat. / Vol. 11 / Zadar, 2017.

timestamp (+0100)	x-axis (deg/s)	y-axis (deg/s)	z-axis (deg/s)
2019-02-09 13:52:01	3.537	0.183	-1.4
2019-02-09 13:52:01	0.366	2.988	-4.2
2019-02-09 13:52:01	-0.976	1.768	-3.4
2019-02-09 13:52:02	1.402	-1.951	2.2
2019-02-09 13:52:02	4.817	-3.171	4.4
2019-02-09 13:52:02	7.134	-3.598	5.7
2019-02-09 13:52:02	8.963	-1.585	4.2
2019-02-09 13:52:02	11.524	0.671	1.3
2019-02-09 13:52:02	11.951	-0.061	2.0
2019-02-09 13:52:02	12.866	-2.317	7.8
2019-02-09 13:52:02	22.317	-4.329	12.3
2019-02-09 13:52:02	52.195	-10.122	22.5
2019-02-09 13:52:02	112.683	-31.707	44.1
2019-02-09 13:52:02	222.622	-52.744	77.9
2019-02-09 13:52:02	324.451	-45.854	125.3
2019-02-09 13:52:02	272.256	-1.463	167.5
2019-02-09 13:52:02	-38.232	103.293	159.8
2019-02-09 13:52:02	-127.134	59.146	26.8
2019-02-09 13:52:02	-171.098	-29.634	-147.1
2019-02-09 13:52:02	-219.451	-90.976	-242.2
2019-02-09 13:52:02	-247.805	-148.110	-271.2
2019-02-09 13:52:02	-239.695	-164.085	-224.7
2019-02-09 13:52:02	-186.524	-57.256	-84.1



scientific discipline

education knowledge information

biology chemistry physics

science

learning teaching

university

research

laboratory

equipment

graduate

postgraduate

professional

concept

object

human

formula

equation

laboratory

discipline

presentation

research

concept

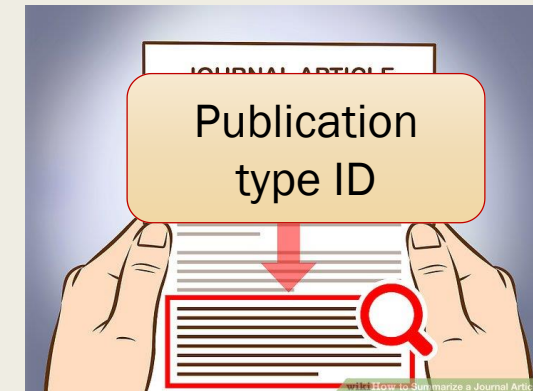
object

human

- Original article – information based on original research
- Case report
- Technical paper – technique or procedure
- Pictorial review – images
- Review article – research on a specific topic
- Commentary – short article with author’s personal opinions
- Editorial – often short review or critique of original articles
- Letter to the Editor – short & on subject of interest to readers

Document Type ID

# In the world of scholarly publications

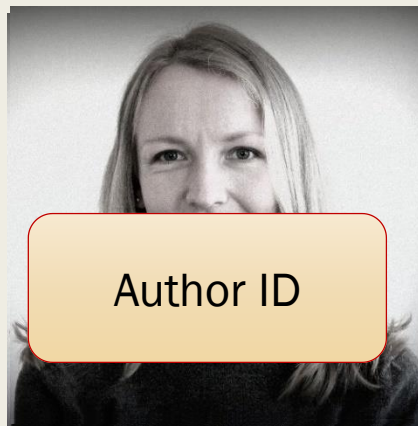


We need to establish relations!

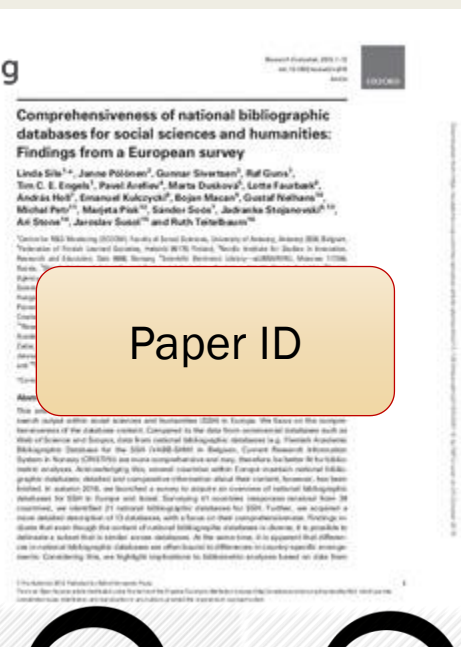


Publication ID

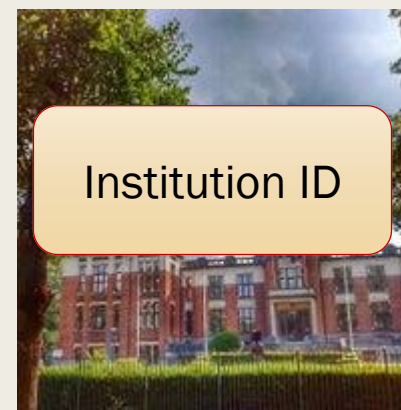
**NIFU**  
Nordisk institutt for studier av innovasjon, forskning og utdanning



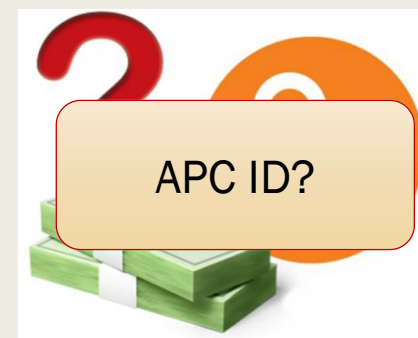
Author ID



Paper ID



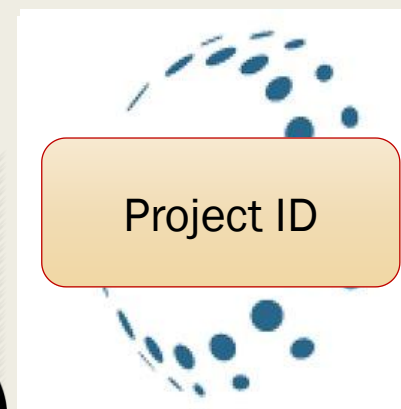
Institution ID



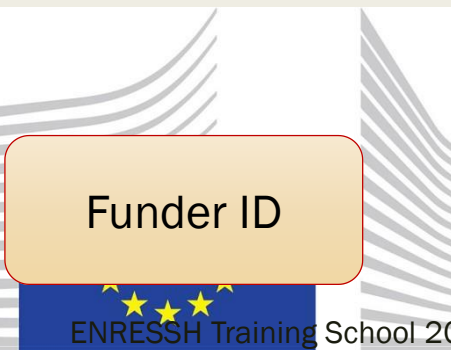
APC ID?

A screenshot of a research database table with columns for various identifiers and metrics. An orange rounded rectangle with the text 'Dataset ID' is overlaid on the table.

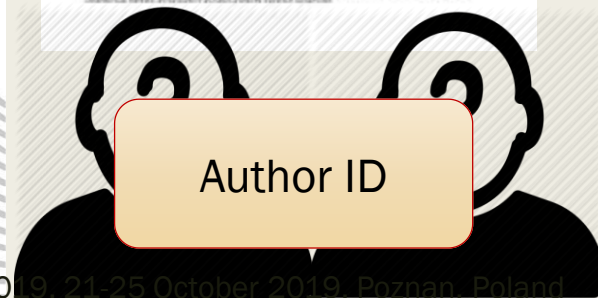
Dataset ID



Project ID



Funder ID



Author ID

# Digital publication

storage

page numbers

sections

page ordering

chapters

version F

usage rights

preservation activities

**STRUCTURAL AND ADMINISTRATIVE  
(TECHNICAL, RIGHTS, PRESERVATION)  
METADATA**

file type

on

creation tool

intellectual property rights

persistent identifier

date of publishing

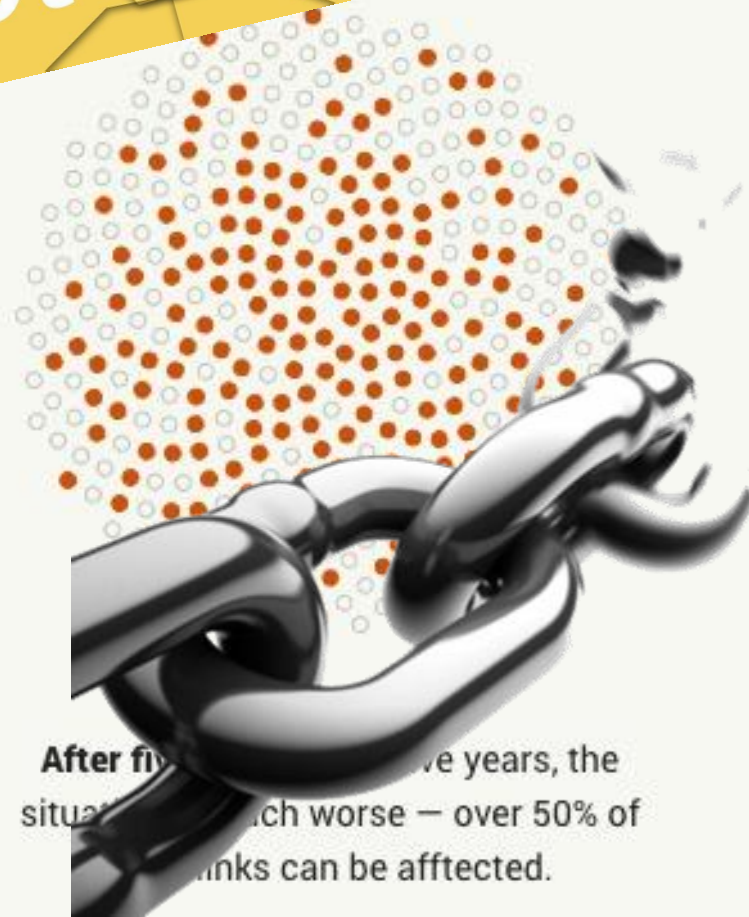
# Research output is increasing

- 2.5-3 million papers published annually
- 8 million researchers (2013, UNESCO) – 4.7 million researchers in USA (2015, United States National Science Foundation)
- 500.000 researchers in SSH (UNESCO)
- 8.300 researchers per 1.000 employed (OECD)
- 28.100 active scholarly peer-reviewed journals (2014, University of Ottawa) (??)
- not only publications! software, research data (FAIR), etc.

# Link Rot



**After one year.** After a year, over 20% of cited links may be dead or otherwise inaccessible.



**After five years.** After five years, the situation is much worse — over 50% of cited links can be affected.



**As time goes on.** Link rot is inevitable and rarely reversible. The longer the wait, the more likely a link will have rotted.

# URL not suitable any more

- more relations between different resources become essential
- the long term preservation of scientific resources, in order to ensure its long-lasting accessibility
- it is necessary that the resources are registered in trusted repositories with a content, that is never changing and which can be referenced and cited this way
- these references themselves have to be stable whereas the underlying repositories are continuously changing - hardware, software, physical place or format
- URLs with their physical paths and semantical contents - frequently outdated

<https://www.pidconsortium.eu>



# We need persistent identifiers:

- pointers to data resources in different forms
  - *publications/documents, software, datasets, bibliographic records/metadata files, multimedia...*
- globally unique
- with infinite lifespan
- used to identify and retrieve resources
- can be resolved to the physical resource

# Persistent identifier

*An identifier is an opaque or explicit number or alphanumeric label which is machine or human readable. It uniquely and permanently identifies and retrieves an object, a document, person, place, organization, or any entity, in the real world and on the Internet.*

<https://www.ouvrirlascience.fr/open-identifiers-for-open-science/>

# Persistent Identifier (PID) characteristics

- a long-lasting reference to a document, file, web page, or other object (Wikipedia)
- Persistent Identifiers (PIDs) are unique entity names that have the organizational commitment and technical infrastructure to support them indefinitely.  
(<https://socialhistoryportal.org>)
- a unique identification code attached to a digital object and registered at an agreed location ([www.ncdd.nl](http://www.ncdd.nl))
- it is guaranteed to remain functional even if an organisation's web address changes
- supports access to resource (a scan, text, audio file, video file, metadata record etc.) as it moves from one location to another
- digital world: not only **persistent** but **actionable**: can be plugged into a web browser and be taken to the identified source

*„Persistence is purely a matter of service,, (Kunze J) - persistent identifiers are only persistent to the degree that someone commits to resolving them for users. No identifier can be inherently persistent.*

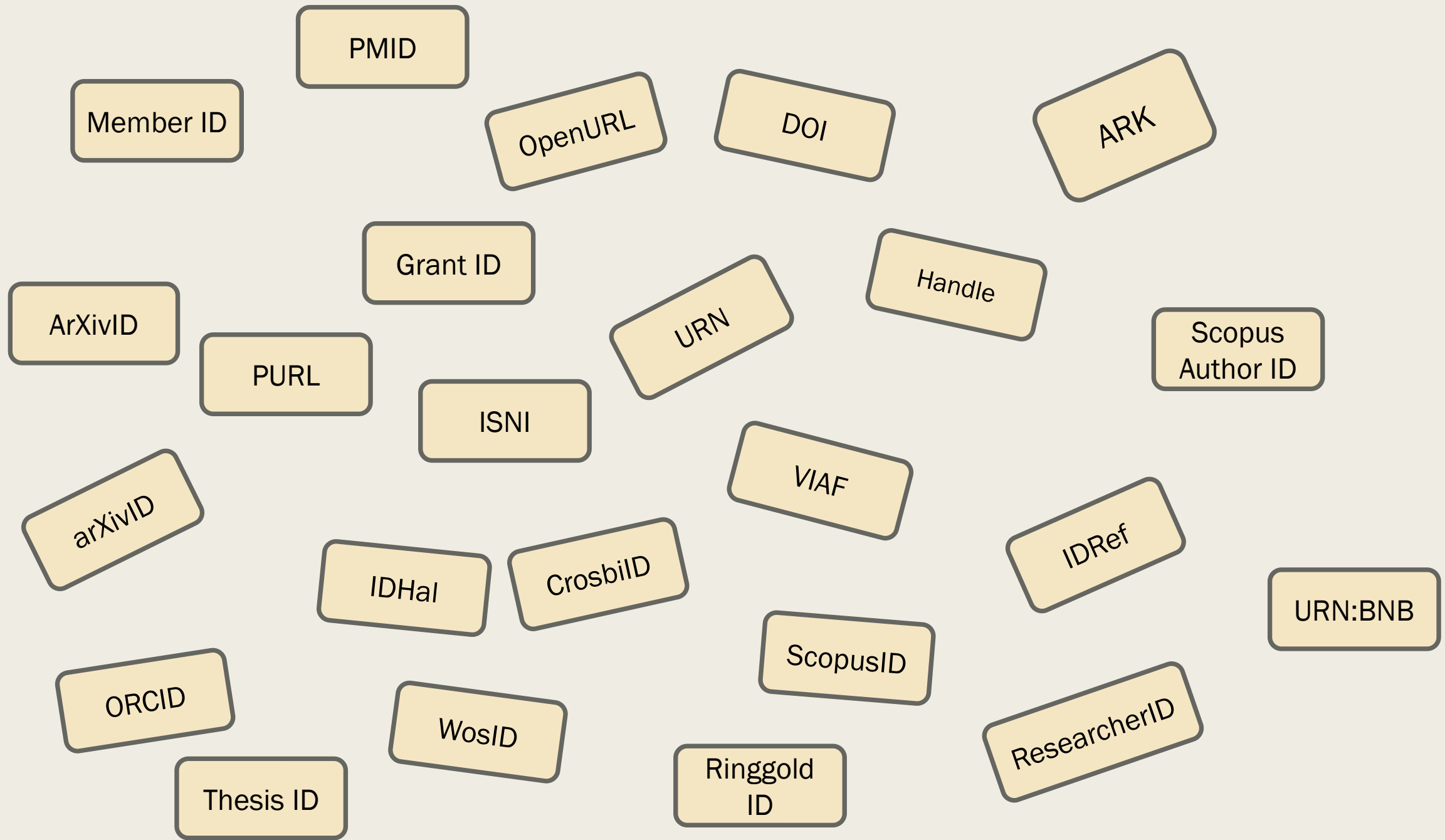
sli.do

use the code #ENRESSH

What persistent identifiers do you know already?

0 2 1





# Implementing Persistent Identifiers

<https://www.youtube.com/watch?v=1M2Eut-0bcg&feature=youtu.be>



# AUTHOR/CONTRIBUTOR

# Example by Altman and Haak, 2014

## An illustrative example: Jens Åge Smærup Sørensen

- J. Å. S. Sørensen
- J. Aa. S. Sørensen
- J. Å. S. Sorensen
- J. Aa. S. Sorensen
- J. Å. S. Soerensen
- J. Aa. S. Soerensen
- Jens Å. S. Sørensen
- Jens Aa. S. Sørensen
- Jens Å. S. Sorensen
- Jens Aa. S. Sorensen
- Jens Å. S. Soerensen
- Jens Aa. S.
- J. Åge S. Sørensen
- J. Aage S. Sørensen
- J. Åge S. Sorensen
- J. Aage S. Sorensen
- J. Åge S. Soerensen
- J. Aage S. Soerensen
- Jens Åge S. Sørensen
- Jens Aage S. Sørensen
- Jens Åge S. Sorensen
- Jens Aage S. Sorensen
- Jens Åge S. Soerensen
- Jens Aage S. Soerensen
- J. Åge Smærup Sørensen
- J. Aage Smaerup Sørensen
- J. Åge Smarup Sorensen
- J. Aage Smarup Sorensen
- J. Åge Smaerup Soerensen
- J. Aage Smaerup Soerensen
- Jens Åge Smærup Sørensen
- Jens Aage Smaerup Sørensen
- Jens Åge Smarup Sorensen
- Jens Aage Smarup Sorensen
- Jens Åge Smærup Soerensen
- Jens Aage Smaerup Soerensen



# Author's names - issues

- one name, multiple persons
  - multiple names, one person
  - unresolved initials
  - pseudonyms
  - missing name/surname
  - added name
  - merged name
  - changed name
- 
- is it an author really an author? (authorship issues)



# China

- Estimates by China's Ministry of Public Security suggest that more than **1.1 billion** people – around 85% of China's population – share **just 129 surnames**. Problems with abbreviations, ordering of given names and surnames and inconsistent journal practices heighten the confusion.
- transliterating Chinese characters for English-language publications is irreversible process

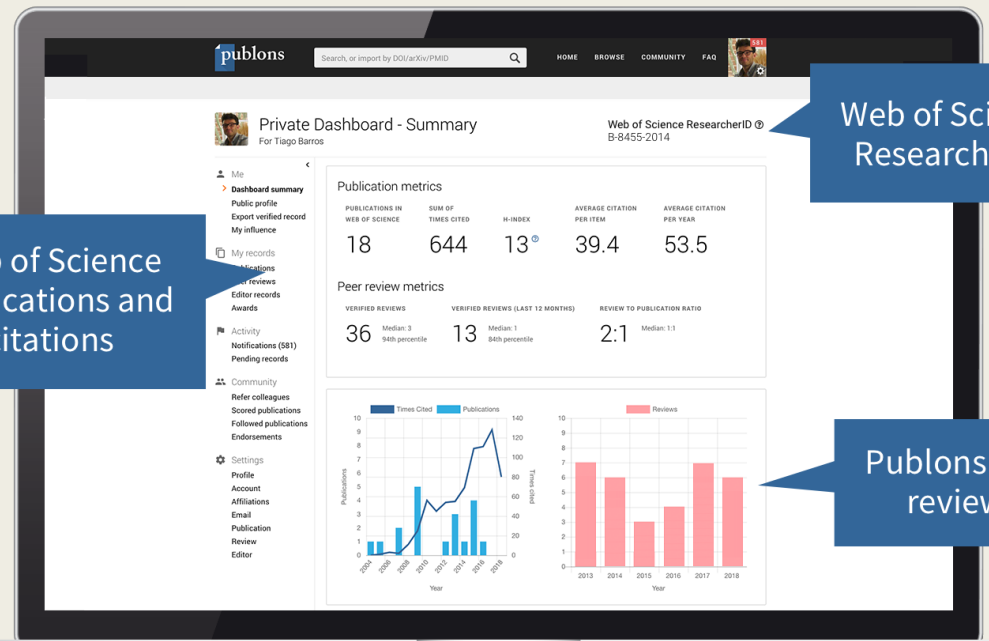


Three researchers in Jia Wei's lab with the surname Wang, Xiao-yan, Xiao-rong and Xiao-xue (left to right, with Chinese names above), all publish in English as X. Wang.

<https://www.nature.com/news/2008/080213/full/451766a.html>

# Author PIDs

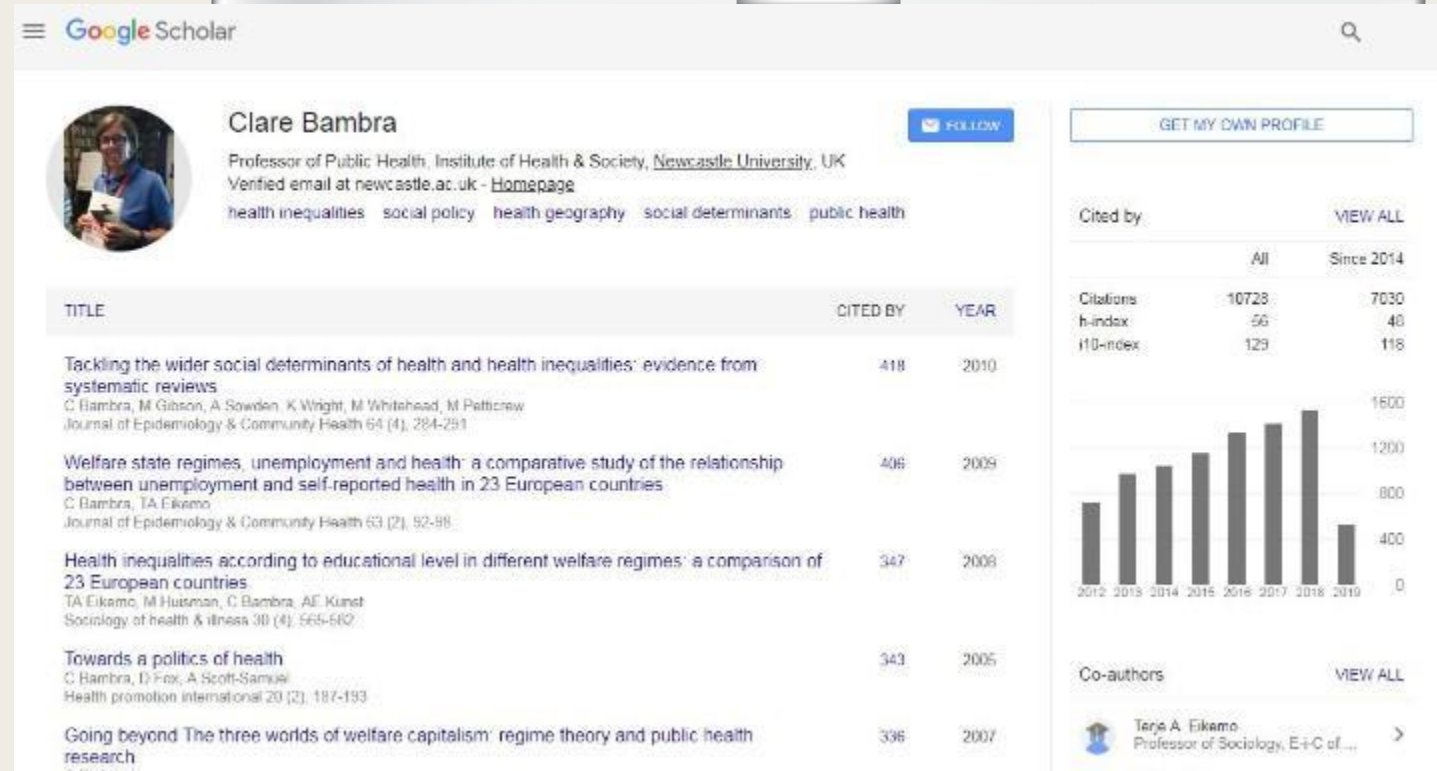
- ORCID
- ResearcherID
- ScopusID
- arXivID
- Google Scholar ID  
[https://scholar.google.hr/citations?user=MIH\\_ohgAAA&hl](https://scholar.google.hr/citations?user=MIH_ohgAAA&hl)
- ...
- national ID (CROSBI: issues with foreign authors, implementation of author profiles in place – unique identifier used to connect all other author identifiers, publications, and projects)
- Additional problems with authors:
  - *cataloguing rules*
  - *ethical issues*



Web of Science publications and citations

Web of Science ResearcherID

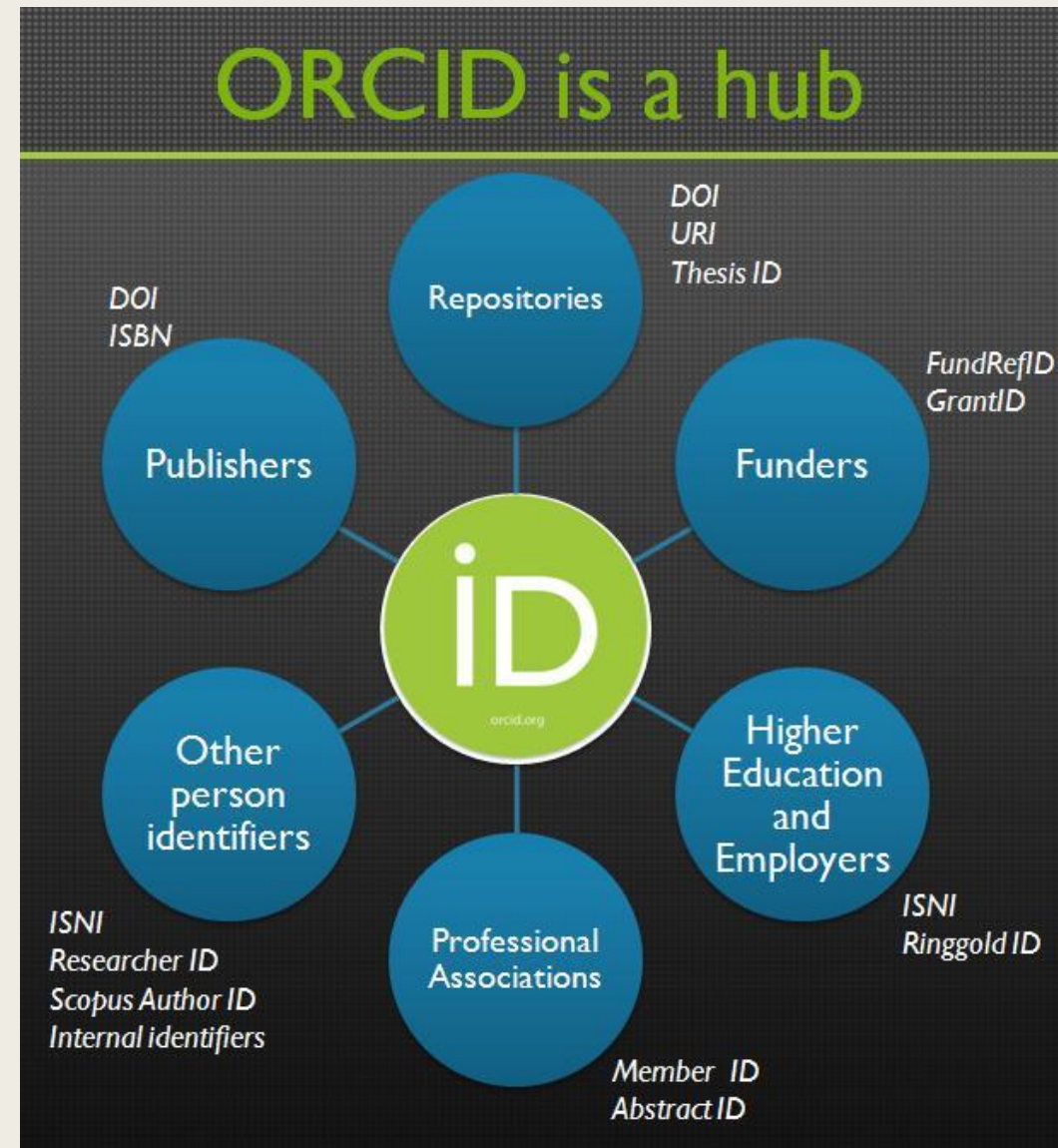
Publons peer reviews



# ORCID - Open Researcher and Contributor ID

- provides a unique and persistent identifier that can be used throughout one's career, across professional activities and affiliations
- provides a free, non-proprietary registry of persistent unique identifiers for researchers, scholars, and analysts
- provides APIs that enable the interoperable exchange of information between systems and to embed identifiers in research systems and workflows
- open source - support community efforts to develop tools and services (GitHub)
- link to other research information identifiers
- connects researchers with their works (papers, grants, datasets, and more), organizations, and other identifiers

Altman M and Haak LL, 2014



# Do you have (your personal) ORCID?

The screenshot shows the ORCID iD profile for Nicholas Higham. At the top, there are navigation links: "EDIT YOUR RECORD" (highlighted in blue), "ABOUT ORCID", "CONTACT US", and "HELP". The ORCID logo is on the left, with the tagline "Connecting Research and Researchers". A statistic on the right states "3,902,433 ORCID iDs and counting. See more...".

The profile header for Nicholas Higham includes a green "ORCID ID" button and the ID "orcid.org/0000-0001-5956-4976". Below this is a "Print view" link. The profile is divided into sections: "Country" (United Kingdom), "Websites" (Personal web site, Blog, Twitter, GitHub, Google Scholar), and "Other IDs" (ResearcherID: A-2315-2009).

On the right side, there is a dark grey navigation bar with expandable categories: "Education (3)", "Employment (6)", "Funding (8)", and "Works (327)". A "Sort" button is located at the bottom right of this bar.

Two work items are visible in a list view:

- MATLAB Guide** (2017-01-01 | book)  
ISBN: 978-1-61197-465-2  
Source: Nicholas Higham (Preferred source)
- Computing the Action of Trigonometric and Hyperbolic Matrix Functions** (2017-01 | journal-article)  
DOI: 10.1137/16m1084225  
Source: Computing and Mathematics Research (Preferred source)

# ORCID is evolving to support Open Science

- **Openness Profile** – new initiative
- based on Open Science Career Assessment Matrix (OS-CAM)
- bottom-up infrastructure meets top-down research policy
  - *disrupts notion of authorship (the ‘C’ in ORCID = contributor)*
  - *links contributions to contemporary RI infrastructure*
  - *format for documenting contributions to open scholarship*
  - *procedures for self-publishing contributions as a digital object with a persistent ID*
  - *strategic use of ORCID record to increase human and machine visibility*

Tatum C, McCafferty S and Brown J, 2019  
<http://doi.org/10.5281/zenodo.2549270>

# ISNI - International Standard Name Identifier

- the International Standard Name Identifier (ISNI) is an ISO standard (ISO 27729) that identifies public identities of **individuals and organizations** (Ringgold Identify)
- an identifier for uniquely identifying the public identities of contributors to media content such as books, television programmes, and newspaper articles (Wikipedia)
- consists of 16 digits - optionally displayed as divided into four blocks
- founded in 2010
- operation of the system prescribed by ISO 27729
- International Agency for ISNI (ISNI International Agency - ISNI-IA)

# ISNI – ISO certified global standard

- identifying the millions of contributors to creative works and those active in their distribution
  - *Researchers, inventors, writers, artists, visual creators, performers, producers, publishers, aggregators, and more.*
  - *Currently 9.97 million individual ISNIs assigned (of which 2.89 million are researchers)*
  - *904,445 organisations*
  - *Included in Wikipedia entries*
  - *Registration Agency: RR Bowker*
- Bridge identifier across multiple domains and a critical component in Linked Data and Semantic Web applications.
  - *Links identities across domains*
  - *Linked to proprietary ID's in databases*
  - *Search and discovery*



<http://isni.org>



# PUBLICATION, DATASET, SOFTWARE...

# ISSN – International Standard Serial Number

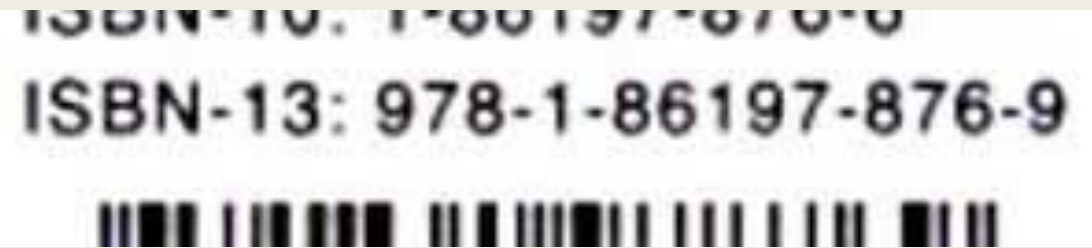
- 8-digit code used to identify newspapers, journals, magazines and periodicals of all kinds and on all media – print and digital
  - *newspapers,*
  - *annual publications (reports, directories, lists, etc.),*
  - *journals,*
  - *magazines,*
  - *collections,*
  - *websites,*
  - *databases,*
  - *blogs, etc.*
  
- digital code without any intrinsic meaning
  - *it does not include any information about the origin or contents of the publication,*
  - *it does not guarantee the quality or validity of the contents.*

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

# Different ISSNs in different databases

- online ISSN
  - print ISSN
  - ISSN-L - brings together the various medium versions of a continuing resource, and thus facilitates content management
- 
- different databases use different ISSN
  - not unique

# ISBN



- a unique (?) international identifier for monographic publications
- ISO Standard created in 1970
  - *Currently a 13-digit number, currently under revision*
- Provides a unique product identifier for books
  - *Enables discovery, standardized processing and distribution of books throughout the global supply chain*
  - *Made machine readable and represented on physical products by an EAN-13 barcode*
- ISBNs are appropriate for books, chapters, maps, audio books
  - *ISBNs should not be assigned to: greeting cards, updatable databases, web pages, games or music*
  - *Substantial change of content requires a new ISBN—rule of thumb = 20%*

Madans, ISBNs and Identifiers, 2014

sli.do please use the code #ENRESSH

**What does ISBN string of numbers tell us?  
Can we extract from ISBN information on:**  
(1/2)

016

country



publisher



title



price



author(s)



# ISBN-13: 978-1-86197-876-9

- The five groups from left to right are:
  - *Prefix element* - makes an ISBN into the universal product code known as an EAN, refers to the fictitious country of Bookland
  - *Registration group element* - refers to the country, geographical area, or language **area** of the book
  - *Registrant element* - refers to the **publisher or imprint issued** that identifier within the registration group
  - *Publication element* - refers to the **publisher or imprint issued** that identifier within the registration group
  - *Check digit* - Its value is calculated from the other nine digits of the ISBN and provides, as its name implies, a check on the validity of the ISBN
  
- standard EAN(International Article Number)-13 for non-book products (posters, mugs...)



The identifier is the anchor for metadata

Madans, ISBNs and Identifiers, 2014

# DOI – Digital Object Identifier (ISO Standard)

- a unique, persistent digital identifier of an object— digital or physical.
  - *Used extensively in scholarly publishing (journals)*
  - *Can be assigned to a work, article, book chapter, image, etc.*
  - *Promotes discovery*
  - *CrossRef.org*
- provides a persistent link (most commonly a URL) to an object and standard metadata for that object.
- can be any length and is structured: Prefix/Suffix Example: 10.1000/182
  - *Prefix - a directory indicator followed by a registrant code. These two components shall be separated by a full stop (period), e.g. 10.1000*
  - *Suffix - a character string of any length chosen by the registrant. Each suffix shall be unique to the prefix element that precedes it, e.g. 182*
  - *Should be displayed as URL: <http://dx.doi.org/10.1000/182>*
- resolves to URL



# DOI components and requirements

- Who is assigning DOI (prefix/suffix)?
  - *The prefix is assigned by the allocation agent (prefix owner is responsible for the content of the URL field)*
  - *The suffix is assigned by the institution that is responsible for the content.*
- Basic requirements are (<https://www.tudelft.nl/en/library/support/datacite-netherlands/>):
  - *The research object must be cite-worthy*
  - *The research object must have well described metadata*
  - *The institution assigning the DOIs commits to long-term storage of the object*

# How DOI works?

- the object's metadata is stored with the DOI
- the metadata may include a location, such as an URL, where the object can be found
- the DOI for an object is permanent, whereas its location and other metadata may change
- referring to an online document by its DOI is **more** stable than referring to it by its URL, because the latter may change
- in case of an URL change, the publisher only needs to update the metadata with the new internet address.



<https://www.tudelft.nl/en/library/support/datacite-netherlands/>

# Domain/language specific

- DataCite for datasets
  - CrossRef for publications
  - EIDR for audio visual objects
- 
- local language support Registration Agencies (e.g. in Japan, China and Italy)

# DataCite example



- annual fee of € 750,- (excl. VAT) per prefix entitling the account holder to create and manage an unlimited number of identifiers (agreement with TU Delft Library)
- DOI can be registered for:
  - *Research data*
  - *Other non-textual materials (e.g. videos, images, 3D models)*
  - *Grey literature*
  - *Articles in Open Access journals published by academic institutions*

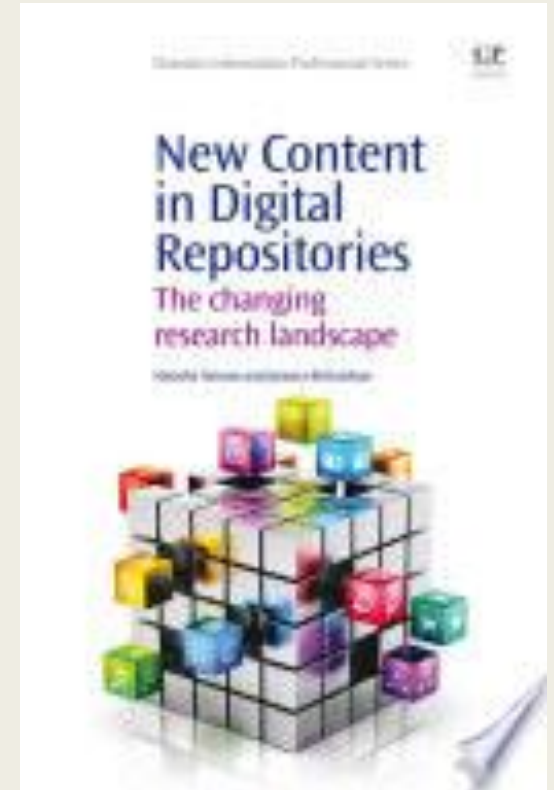
# Handle System

- a technology specification for **assigning, managing, and resolving** persistent identifiers for digital objects and other resources
- the protocols specified enable a distributed computer system to store identifiers (names, known as Handles) of digital resources and resolve those Handles to the information necessary to **locate, access,** and otherwise make use of the resources.
- That information can be changed as needed to reflect the current state or location of the identified resource without changing the Handle.

<https://www.doi.org/factsheets/DOIIdentifierSpecs.html>

# Handle is:

- reliable
- scalable
- flexible
- trusted
- built on open architecture
- transparent to users
  
- the main goal: to contribute to persistence



New Content in Digital Repositories: The Changing Research Landscape  
By Natasha Simons, Joanna Richardson

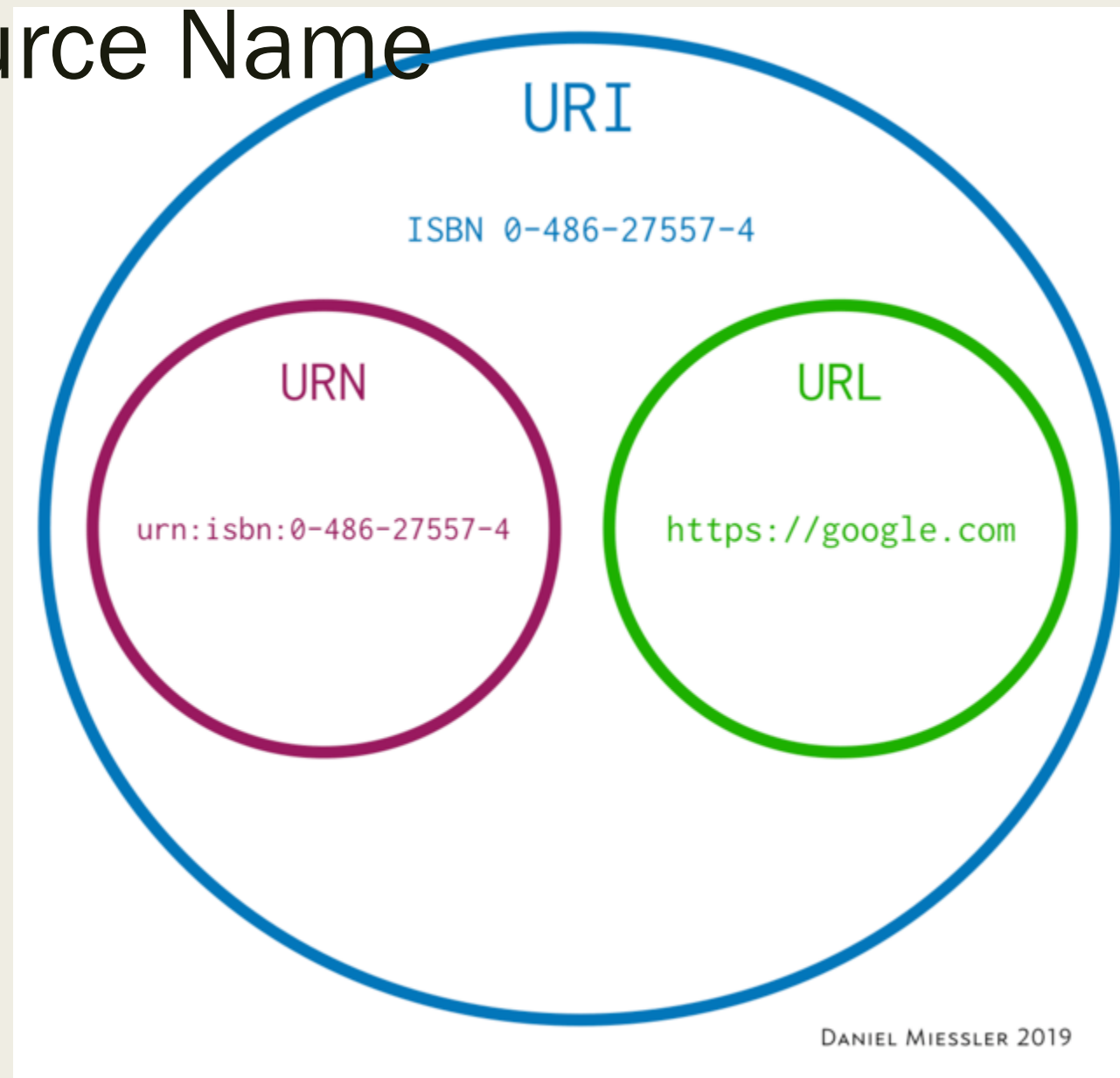
# Handle



- the system ensures that handles are unique and that they can be retained over long time periods
- since the system makes no assumptions about the characteristics of the items that are identified, handles can be used in a wide variety of systems and applications.
- Components:
  - *naming authorities, handle generators, the global handle server, local handle servers, caching handle servers, client software libraries, proxy servers, and administrative tools*
  - *all components, except the local handle server, have been implemented and are available for general use by the research community*

# URN - Uniform Resource Name

- Uniform Resource Identifier (URI) that uses the URN scheme, and does not imply availability of the identified resource
- Both URNs (names) and URLs (locators) are URIs, and a particular URI may be both a name and a locator at the same time
- Several national libraries in Europe have a **URN:NBN** service
- there are other URN namespaces, e.g.: URN:ISBN, URN:ISSN, URN:IETF, URN:LEX...





# PROJECT/FUNDER

# FundRef

- Benefits:
  - *Funding organizations are able to better track the published results of their grants*
  - *Research institutions are able to monitor the published outputs of their employees*
  - *Publishers are able to analyze the sources of funding for their authors and ensure compliance with funder mandates*
  - *Readers and the public benefit from greater transparency on who funded the research and the results of R&D funding.*
- How it works? Authors acknowledge the funding sources for their research in their publications. Using the Funder Registry, publishers can clearly identify the funders who backed the research, standardize this metadata and send it to us.
- openly available through [funding data search](#) and [API](#)

<https://www.crossref.org/services/funder-registry/>



21,494 funders connected  
to 4,265,936 published works

Home > Find a service > **Funder Registry**

View and download the  
Funder Registry service factsheet

**Read the factsheet in your language:** [español](#), [العربية](#), [Bahasa Indonesia](#), [Brazilian Portuguese](#); or in English by clicking the image above.

A veritable who's who of funders worldwide, the Crossref Funder Registry is a unique taxonomy of grant-giving organizations.

A [freely-downloadable file](#), this registry lists funders and their unique identifiers. It is CC-0 and available to integrate with your own systems.

## HRVATSKA ZAKLADA ZA ZNANOST

## TYPE

- Journal Article (2,314)
- Conference Paper (9)

## YEAR

- 2018 (672)
- 2019 (623)
- 2017 (472)
- 2016 (351)
- 2015 (145)
- 2014 (43)
- 2020 (10)
- 2013 (5)
- 2012 (2)

## PUBLICATION

- Physical Review D (85)
- Physical Review C (63)
- Physics Letters B (43)

SORT BY: RELEVANCE PUBLICATION YEAR

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PAGE 1 OF 2,323 RESULTS

## Harnack Inequality for Subordinate Random Walks

**Journal Article** published **Jun 2019** in **Journal of Theoretical Probability** volume **32** issue **2** on pages **737** to **764**

Research funded by Hrvatska Zaklada za Znanost (3526)

Authors: Ante Mimica, Stjepan Šebek

<https://doi.org/10.1007/s10959-018-0821-5> [Actions](#)

## Singlet state formation and its impact on the magnetic structure in the tetramer system SeCuO<sub>3</sub>

**Journal Article** published **9 Aug 2018** in **Physical Review B** volume **98** issue **5**

Research funded by Hrvatska Zaklada za Znanost (IP-11-2013-2729) | Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung (166298169699) | H2020 Euratom (633053)

Authors: Tonči Cvitanić, Vinko Šurija, Krunoslav Prša, Oksana Zaharko, Ivan Kupčić, Peter Babkevich, Matthias Frontzek, Miroslav Požek, Helmuth Berger, Arnaud Magrez, Henrik M. Rønnow, Mihael S. Grbić, Ivica Živković

<https://doi.org/10.1103/physrevb.98.054409> [Actions](#)

## Cu nuclear magnetic resonance study of charge and spin stripe order

# Example: Croatian national Project Database (created and maintained by RBI)

Baza podataka projektnih aktivnosti u znanosti i visokom obrazovanju RH

institut ruđer bošković

Naslov ili dio naslova, šifra projekta, voditelj, ustanova, financijer

Filter:

- Početak
- Završetak
- Financijer
- Linija financiranja
- Ustanova

Za izraz "institut ruđer bošković" pronađeno je 317 rezultata

Sortiranje: Godina početka, prvo najstariji Broj prikazanih rezultata: 10

**Nastavni materijali za doktorski studij upravljanja okolišem** (Voditelj: Tarzan Legović)  
Trajanje: 2005 do 2006; Iznos financiranja: 200.000,00 HRK  
HRZZ Znanstveno - istraživački ID: 01.01/07

**Razvoj nuklearnih tehnika za analizu objekata hrvatske kulturne baštine** (Voditelj: Vladna Desnica)  
Trajanje: 2006 do 2007; Iznos financiranja: 118.400,00 HRK  
HRZZ ID: 02.03/11

**Molecular Simulations in Biosystems and Material Science (SimBioMa)** (Voditelj: Vlasta Mohaček-Grošev)  
Trajanje: 2008 do 2010; Iznos financiranja: 10.000,00 HRK

# RESEARCH ORGANIZATION

ROR

- national research organization's identifiers
- globally: ROR, GRID, Ringgold, etc.
  
- still imperfectly updated and connected, even if the reference systems used for alignments (IdRef, ISNI) improve continuously

# GRID.ac



- Global Research Identifier Database – 97,900 institutions included (122 from Croatia)
- „Much more than just IDs and names, we augment the data with types, hierarchical structures, locations and [much more](#). We think openly available IDs are vital to using data effectively, so we use GeoNames IDs, NUTS3 regions, WikiData IDs, CrossRef Open Funder Registry IDs, ISNI and link to country specific IDs like UCAS codes, UKPRN numbers, HESA codes and more.” (<http://grid.ac>)








# Rudjer Boskovic Institute

grid.4905.8

## Metadata:

ID grid.4905.8  
 Types Facility  
 Established 1950 CE

## External links:

Institute Links <http://www.irb.hr/>  
 Wikipedia <https://en.wikipedia.org/wiki/Ru%C4%91e...>  
 0000 0004 0635 7705  
 501100007259  
 4763329  
 Q7383690  
 [https://ror.org/02mw21745\\*](https://ror.org/02mw21745*)  
 \* Preferred ID

## Alternate Labels:

Aliases  
 Acronyms RBI  
 IRB  
 Croatian Institut Ruđer Bošković

## Relationships:

None

## Zagreb - Croatia

REPORT AN ERROR



## GeoNames

Type	Name	GeoNames Code	GeoNames ID
City	Zagreb		3186886
Admin 1 Region	City of Zagreb	HR.21	3337532
Country/Territory	Croatia	HR	3202326

## NUTS

Level	Name	NUTS code
NUTS 3	Grad Zagreb	HR041
NUTS 2	Kontinentalna Hrvatska	HR04
NUTS 1	HRVATSKA	HR0

## FREE DATABASE

---

We are releasing the IDs and metadata for all to use under the [Creative Commons Public Domain 1.0 International licence](#).

GRID has been broadly adopted in the Digital Science portfolio companies to facilitate data exchange, increase functionality, and support novel features. We think these benefits should be shared more widely in the scientific community to foster innovation and increase interoperability.

**No yearly fees, no complex licensing agreements, no hassle.** GRID is completely free to use, however if you have time we would love to hear what you build with it!



# Ringgold (subscription based)

- Ringgold's Identify Database is the organizational reference database
- *Identify* contains over 500,000 organizations in all countries and sectors including academia, corporations, hospitals, and government entities
- Each institution is described with up to 25 structured metadata including: full legal name, location, alternate names, URL, size metrics, tier, subjects, industry sector, and more
- Related organizations are linked together, such as universities and their departments, or corporate entities with subsidiary firms or divisions
- Comprehensive reference database to normalize organization data
  - *support data governance & master data management*
  - *populate critical systems with clean records, free of duplicates*
  - *easily transmit and share data across external and internal systems*
  - *communicate more effectively with external partners*
  - *power-enhanced analytics for decision support*

The logo for Ringgold, featuring the word "RINGGOLD" in a bold, blue, sans-serif font. The letter "G" is stylized with a circular element inside it.

# ROR (ror.community) – work in progress

- Research Organization Registry Community
- Unique and persistent IDs for **organizations** in the research community
- started by a group of 17 organizations (2016-2018)
- From ror.community:
  - *ROR is a community-led project to develop an open, sustainable, usable, and unique identifier for every research organization in the world.*
  - *ROR will be providing organization identifiers that are globally unique, stable, discoverable, and resolvable*
  - *in addition, ROR will develop appropriate metadata schema for organizations and explore interoperability with other identifiers through relationship metadata*
  - *community is what drives ROR, so please consider getting involved*



# ROR Recommendations

- ROR is intended for use by the research community, for the purposes of increasing the use of organization identifiers in the community and enabling connections between organization records in various systems.
- ROR will derive utility through encouraging cross-talk between existing registry providers.
- Access to organizations for managing ROR records shall be via permission. ROR will be responsible for granting record management permission.
- ROR will focus on the organization levels that are most pertinent for the affiliation use case (who employs, who educates, who funds, etc.).
- ROR will require metadata elements for each record sufficient to uniquely identify the organization.
- ROR documentation and required metadata will be available for use under a recommended [Open Definition](#) conformant license, in human- and machine-readable formats.
- ROR will seek seed data from organization identifier providers who serve the research community, whose data meet the metadata requirements, and which data are available under a recommended [Open Definition](#) conformant license.
- There will be open criteria and documented processes for inclusion/exclusion, creating, merging, and deprecating a ROR record.
- Record changes will be tracked and recorded using an open provenance model. ROR records may be deprecated, but no assigned identifier will be deleted.
- ROR will be building a supporting new technology. We will maintain a robust customer support system and an open knowledge base to maintain a good relationship with the community's technical teams.

# VIAF - Virtual International Authority File

- provides libraries and library users with convenient access to the world's major name authority files (corporate names, geographic names, personal names, works, expressions, subject headings, bibliographic titles)
- VIAF Contributors regularly supply authority data that VIAF matches, links, and groups
- All descriptions for a given entity are merged into a cluster that brings together the different names for that entity
- Allows researchers to identify names, locations, works, and expressions while preserving regional preferences for language, spelling, and script.
- 2003 - OCLC, Library of Congress and German National Library, later on National Library of France
- virtual integration of national normative data for persons, corporate bodies and geographical names into a single normative database
- contributors: more than 40 organizations from more than 30 countries
- Croatian NUL from May 2013 in VIAF

# NUL contributions to VIAF

## SHORT DESCRIPTION OF THE AUTHORITY DATA:

Described entities and quantity/number of authority records: as of January 1, 2018:

- ✓ Persons - 485,176
- ✓ Conferences - 15,083
- ✓ Corporate bodies - 21,309
- ✓ Geographical names - 15,140
- ✓ Titles - 1,741
- ✓ Subject Headings (not included in VIAF)

VIAF  
Virtual International Authority File

**Search**

Select Field:  Select Index:  Search Terms:

<a href="#">Leader</a>	00000cz a2200037n 45 0
<a href="#">001</a>	NSK 000111015 ( <a href="#">VIAF cluster</a> )
<a href="#">003</a>	NSK
<a href="#">005</a>	20170407172723.0
<a href="#">008</a>	100609nd azznaabn  a aaa
<a href="#">035</a>	‡a (NSK)000111015
<a href="#">035</a>	‡9 (HR-ZaNSK)111954
<a href="#">035</a>	‡9 (HR-ZaNSK)950220043
<a href="#">035</a>	‡a (HR-ZaNSK)000111015
<a href="#">040</a>	‡a HR-ZaNSK ‡b hrv ‡c HR-ZaNSK ‡e ppiak ‡f nskps
<a href="#">065</a>	‡a 007 ‡c informacijske znanosti, kibernetika ‡2 udc
<a href="#">065</a>	‡a 02 ‡c knjižničarstvo ‡2 udc
<a href="#">100</a>	1 ‡a Stojanovski, Jadranka
<a href="#">400</a>	1 ‡a Stojanovski, J.
<a href="#">670</a>	‡a Informacijski sustav prirodnih i tehničkih znanosti. Zagreb, 1994.

## Search

Select Field:

All Headings ▾



Select Index:





All VIAF ▾

Search Terms:


Ruder Boskovic Institute Zagreb, Croatia

**Search**

Institut Ruđer Bošković Zagreb  

Institut Ruđer Bošković.    

Institut Ruder Bošković (Jugoslavija) 

Ruder Boskovic Institute Zagreb, Croatia 

Institut Ruđer Bošković 

VIAF ID: 143735567 (Corporate)

Permalink: <http://viaf.org/viaf/143735567>

### Preferred Forms

 110 2 \_  [Institut Ruder Bošković \(Jugoslavija\)](#)

 110 2 \_  [Institut Ruđer Bošković](#)

 110 2 0  [Institut Ruđer Bošković](#)





# OTHER NEW/OLD IDENTIFIERS

# CRedit (Contributor Roles Taxonomy)

<https://www.casrai.org/credit.html#>

- high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output
- most publishers require author and contribution disclosure statements upon article submission – some in structured form, some in free-text form – at the same time that funders are developing more scientifically rigorous ways to track the outputs and impact of their research investments.
- MDPI, PLOS...



<http://openresearchbadges.org/>

# The CRediT roles

#	Role	Definition
1	<b>Conceptualization</b>	Ideas; formulation or evolution of overarching research goals and aims.
2	<b>Data curation</b>	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.
3	<b>Formal analysis</b>	Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data.
4	<b>Funding acquisition</b>	Acquisition of the financial support for the project leading to this publication.
5	<b>Investigation</b>	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.
6	<b>Methodology</b>	Development or design of methodology; creation of models.
7	<b>Project administration</b>	Management and coordination responsibility for the research activity planning and execution.
8	<b>Resources</b>	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.
9	<b>Software</b>	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.
10	<b>Supervision</b>	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.
11	<b>Validation</b>	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.
12	<b>Visualization</b>	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.
13	<b>Writing – original draft</b>	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).
14	<b>Writing – review &amp; editing</b>	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

# Publication types (CASRAI, COAR, OpenAIRE)

- [Output Types/Book](#)
- [Output Types/Book Chapter](#)
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- [Output Types/Encyclopedia Entry](#)
- [Output Types/Funding Submission](#)
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- [Output Types/License](#)
- [Output Types/Magazine Article](#)
- [Output Types/Manual](#)
- [Output Types/Newsletter Article](#)
- [Output Types/Newspaper Article](#)
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- [Output Types/Report](#)
- [Output Types/Research Tool](#)
- [Output Types/Supervised Student Publication](#)
- [Output Types/Tenure-Promotion](#)
- [Output Types/Test](#)
- [Output Types/Trademark](#)
- [Output Types/Translation](#)
- [Output Types/University Academic Unit](#)
- [Output Types/Website](#)
- [Output Types/Working Paper](#)

# Choosing the most suitable Persistent Identifier

<https://www.youtube.com/watch?v=rvJVvazpTuQ&feature=youtu.be>



# Implementation of PIDs in your bibliography...towards linked data bibliographies

Thank You!

[jadranka.stojanovski@irb.hr](mailto:jadranka.stojanovski@irb.hr)

[jadranka.stojanovski@unizd.hr](mailto:jadranka.stojanovski@unizd.hr)

<https://orcid.org/0000-0001-7399-522X>