SN SciGraph Analytics

Building business tools for the scholarly publishing domain using LOD and the ELK stack

SEMANTICS Vienna 2018

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Agenda (25 Min Talk + 5 Min Q&A)



Background

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SN SciGraph: Linked Open Data Motivation

SPRINGER NATURE



Formed in May 2015 through the merger of Nature Publishing Group, Palgrave Macmillan, Macmillan Education and Springer Science+Business Media

SPRINGER NATURE

Three Areas Of Knowledge We Focus On





Vision: From Content to Data

• We create the largest state-of-the-art linked open data aggregation platform for the scholarly domain from a publisher.

 In doing so, we increase content discoverability and provide data tools and services for researchers, authors, editors, librarians, data scientists, funders, conference organizers, and many others by adding value across all content types.

raph

We publish content

HTN

We manage knowledge

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Stanford Libraries awarded \$4 Million grant to implement linked data metadata environment

Stanford, CA—A proposal to dramatically shift how libraries create metadata and greatly improve how users discover library holdings has been accepted and awarded to Stanford Libraries by The Andrew W. Mellon Foundation. In partnership with the libraries of Cornell, Harvard and the University of Iowa, Stanford will lead the effort to integrate library data into the Web, in a semantic way, so it can be discovered intelligently in Web searches as well as in a library's catalogue.



This is a **major development** in the area of <u>LOD and libraries</u>. Up until now a vast number of libraries have <u>adopted Linked Open Data</u> but mainly as part of some kind of data publishing effort – in other words, although their catalogue (or part of) was transformed and made available as LOD, internally they would still rely on traditional data standards like MARC (Machine-Readable Cataloging).

This is now starting to change. There is a **more shared understanding of the opportunities** opened by using Linked Open Data throughout the information management lifecycle.

In **Europe**, a similar project was recently <u>announced by the National Library of Sweden</u> (KB), which has deployed a new version of the Swedish Union Catalogue, <u>Libris</u>, fully based on Bibframe 2.0 and Linked Open Data.

SN SciGraph: Benefits & Applications



Linked Open Data Publishing

- **Researchers** can analyze / build upon our data
- Contributing to Open Research

Content Discoverability

- SN SciGraph Data Explorer
- APIs for better end user applications

Business Intelligence and Analytics

- Dashboards for understanding the research landscape
- Editors, Sales, Marketing etc.

AAA: Architecture, App stack, Achievements

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ETL Architecture: main features

Tech stack

- > Airflow framework (Airbnb)
- > Amazon S3 to make backups
- > GraphDB triplestore (staging and presentation)
- > Elastic search and APIs

Components & Principles

- > Graph must be 'ephemeral'
- > Data sources versioning algorithm
- > Identity Persistence service
- > Validation via SHACL (TopBraid API)









ETL Architecture: data flow



Linked Open Data Publishing So Far

SN SciGraph Data Explorer Gett	ingStarted Models - Downloads License FAQ	
You are here: Home		
Springer Natur	Te SciGraph Data Explorer	
Search for		GO
Not sure where to start? Try searching	for an organization, e.g. the 'Francis Crick Institute', a topic, e.g. 'machine learning', or an author, e.g. 'Steven Pinker'.	
Γ	SN SciGraph Data Explorer Getting Sorted Models - Downloads License TAQ	Search 60
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Nov 2017 Release:

- 1 billion facts / 200 gb download size
- Licensing: CC0, CC-BY-NC & CC-BY

Metadata about:

- Journals & Articles (8M) + Abstracts
- Books & Chapters (4M)
- Grants (200k)
- Subjects, Research Organizations,
 Conferences, Ontologies (100k)
- Links to to other datasets (20M): Crossref, GRID, MESH, DBpedia, Wikidata

Linked Open Data Explorer

Cell division

Cell division is the process by which a parental cell gives rise to two daughter cells. The process involves both nuclear division and cytokinesis and can either produce two equal cells (symmetric cell division) or two cells with different cellular fates (asymmetric cell division).



Related objects

FUNDER

National Cancer Institute

RECIPIENT

 Massachusetts Institute of Technology

FIELD OF RESEARCH CODES

- Biological Sciences
- Biochemistry And Cell Biology
- Medical And Health Sciences
- Oncology And Carcinogenesis

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Examples of users already working with SN SciGraph data

- <u>SemSpect</u>: Uncovering the Hidden in Springer Nature's SciGraph
 - The essential problem is to get an idea of the queries that deliver real insight.
 - <u>This video</u> shows a sample exploration of SN SciGraph data with SemSpect.



- Other examples would be
 - ResearchGraph (Australia)
 - PubChem (USA)

Linked Open Data Put To Use By The Open University, UK

Geographical trends in research: a preliminary analysis on authors' affiliations

Andrea Mannocci, Francesco Osborne, Enrico Motta

Knowledge Media Institute, The Open University, Milton Keynes, UK name.surname@open.ac.uk

Abstract. In the last decade, research literature reached an enormous volume with an unprecedented current annual increase of 1.5 million new publications. As research gets ever more global and new countries and institutions, either from academia or corporate environment, start to contribute with their share, it is important to monitor this complex scenario and understand its dynamics.

We present a study on a conference proceedings dataset extracted from Springer Nature Scigraph that illustrates insightful geographical trends and highlights the unbalanced growth of competitive research institutions worldwide. Results emerged from our micro and macro analysis show that the distributions among countries of institutions and papers follow a power law, and thus very few countries keep producing most of the papers accepted by high-tier conferences. In addition, we found that the annual and overall turnover rate of the top 5, 10 and 25 countries is extremely low, suggesting a very static landscape in which new entries struggle to emerge. Finally, we highlight the presence of an increasing gap between the number of institutions initiating and overseeing research endeavours (i.e. first and last authors' affiliations) and the total number of institutions participating in research. As a consequence of our analysis, the paper also discusses our experience in working with affiliations: an utterly simple matter at first glance, that is instead revealed to be a complex research and technical challenge yet far from being solved.

Keywords: Scholarly knowledge, affiliations, conferences, scientometrics, research, scigraph

Best paper award at WWW 2018

Focus on conference proceedings data in SN SciGraph from 1996 to 2017

Findings :

- "few countries keep producing most of the papers accepted by high-tier conferences.
- "turnover rate [..] is extremely low[..] new entries struggle to emerge.
- "increasing gap between the number of institutions initiating and overseeing research [..] and the total number of institutions participating in research"

DBpedia Subjects Browser

Subject:

SN SciGraph articles tagged with this subject: 20

Note: open an article panel to load its metadata from SNSciGraph (open all)

The connecting peptide, or C-peptide, is a short 31-amino-acid polypeptide that connects insulin's A-chain to its B-chain in the proinsulin molecule. In the insulinsynthesis pathway, first preproinsulin is translocated into the endoplasmic reticulum of beta cells of the pancreas with an A-chain, a C-peptide, a B-chain, and a signal sequence. The signal sequence is cleaved from the N-terminus of the peptide by a signal peptidase. leaving proinsulin. After proinsulin is packaged into vesicles in the Golgi apparatus (beta-granules), the C-peptide is removed, leaving the A-chain B-chain, bound together by disulfide bonds, that constitute the insulin molecule.

	View on D8padia	
View on Wikepedia	View on Wikepedia	ĺ

Co-occurring subjects:

1. http://scigraph.springernature.com/things/articles/00e95d9c5eec61454b2482f0a11dfbf7

Title Effect of paricalcitol on pancreatic oxidative stress, inflammatory markers, and glycemic status in diabetic rats & View SN SciGraph record

DOI 10.1007/s11845-017-1635-7 @ View publication

Abstract ObjectivesThis study is designed to explore the effect of paricalcitol (vitamin D receptor agonist) on pancreatic oxidative stress, inflammatory markers, and adiponectin and glycemic status in diabetic rats. Materials and methodsForty Sprague-Dawley male rats aged 10-12 weeks (150-250 g) were used in this study. Type 2 diabetes was developed by providing 4 weeks of high-fatdiet feeding before one shot of streptozotocin injection (40 mg/kg i.p.). Four study groups were designed as normal control rats. diabetic control vehicle-treated, diabetic paricalcitol-treated (0.8 µg/kg), and diabetic glibenclamide-treated (0.6 mg/kg) groups with 10 animals in each. After treatment of diabetic rats for 3 months, pancreatic inflammatory and oxidative stress markers, plasma adiponectin, glycemic status parameters, and histopathological pancreatic islet changes were evaluated. ResultsParicalcitol and glibenclamide treatment significantly (P < 0.05) decreased plasma glucose, insulin resistance, and pancreatic malondialdehyde and tumor necrosis factor-q levels. Moreover, they significantly (P < 0.05) increased plasma fasting insulin, C-peptide, adiponectin, pancreatic IL-2, catalace, superoxide dismutase, glutathione peroxidase, and reduced glutathione when contrasted with diabetic control rats. Furthermore, they prevented extensive histopathological damage in the pancreas of diabetic rats. ConclusionsParicalcitol reduced pancreatic oxidative stress and inflammatory markers, and improved glycemic status in diabetic rate

DBpedia subjects:	Adiponectin	Agonist	Blood pla	esante	C-peptide	Galcilriol receptor	Diabetes	metikus type 2	Glaose
Histopethology	n Intedeukin	2 Labe	alory (at	Male	ndialdehyde	Oxidative stress	Pancreas	Superoxide di	smalase
Tumor necrosis factor a	lipha								

🗞 Subjects:	SN SciGraph articles tagged with these subjects 4
C-peptide +	Note open an eticle panel to load its metastata from SNSciGraph (open all)
Diabetes mellitus renove	1. http://ecigraph.springernature.com/things/articles/1d7c447404635f1f57ad9472a322dd13
+	2. http://scigraph.springernature.com/things/articles/1cla603dd75ebc2ffca43819cf1d43302
Insulin remove	3. http://scigraph.springernature.com/things/articles/927f4b1caf113107171428d91fa28793
Reset	4. http://scigraph.springemature.com/things/articles/96b2b571be6f2c28ba27e9c47e00ce42

What is this?

The prototype allows to search a collection of 2017 SN journal articles which have been semantically enriched using DBpedia subjects.

Purpose and Code:

The purpose of this prototype is to evaluate the quality of the subjects and generate more ideas for future applications.

For more info, see the project source code on GitHub

ELK for Business

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Internal Business Drivers

User	Use case examples
Sales	 Understanding how institutes use SN content to help drive new deals Show that SN content leads to commercial applications (patents and grants)
Marketing	 Identifying researchers for better profiling, to support marketing efforts Understanding how SN content is used at every point of the research process, to demonstrate the value of being part of the SN world
Editorial	 Identify potential reviewers for both journals and books Check the performance of a published title to commission another edition of the same book or commission a different book from the same author Assessing the quality of competing journals and book series, in particular by enabling access to key journal and book metrics
Publishing	 Understand the growth of a given field, or the distribution of sub-fields, to determine new growth strategies and portfolio management A tool to ensure that all publications are properly indexed in 3rd party databases

i.e. "where you can see an institution's relationships with Springer Nature'

				How r	SN editor	
				How many a	SN reviewers	
				which are the main institutions publishing in that area?		
				rhere does funding come from?	and grants by fields	
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		\square	1	for specific topics a ranking based on usage of the book chapters		
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			4	tre there any Open Access publications of this topic available?		
			2	Vhat kind of books with this topic are there? (professional books, undergraduate textbooks, raduate textbooks, popular science books)?		
			1	are there any webpages, apps and blogs existing with a high quality of content? (To stand out rom google search)		
				Which conferences take place in subject areas that show an increase of funding over the last 5 years in a given geographical area?		
			(What is the ratio open-access vs. non-open-access content in a given subject area, broken down to a given set of institutions or countries?		
			1	Can you give me an overview of a specific research field with its key topics over the last 5 years together with the distribution of authors per country?		
	Topics		1	Show funding information grouped by subject area in all available taxonomies (FOR, PMC, Nature subjects, LCC, Dewey etc.)		
			1	How can we identify new areas of research, e.g. by linking article and subject over time to quantity, impact Factor and number of new journals in a field and funding for articles in that field?		
			ſ	What topics are newly emerging in sustainable cities research? What is attracting the most attention?		
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Can you make this				topic \rightarrow who else is doing research in this area? \rightarrow Their research projects are financed by whom?		
Can you also extract signif			- [Topic map/ concept map for navigation - which topics are related to each other (diverse		
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What was the funding patt	ern	SI	upple	mentary books, courses)		
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Dashboards Architecture



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Mapping denials to textbook modules



and Chemical Biology

Challenges with Triple Stores

Why the ELK stack

Limitation of triple stores

- > Doesn't support real time analysis
- > Too slow with counts & aggregations
- > Denormalization leads to a significant increase in data volumes

Pros of ELK stack

- > Very fast (scales linearly)
- > GraphDB has built-in connector service
- > Kibana offers powerful data visualizations out of the box
- > It's free!

Why the ELK stack [2]



System Architecture



Elasticsearch connectors (automatic updates / deletions after each ingest)

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Analytics Dashboard Examples You are here: Dashboards Launcher / Journals

Journals

Filters

45 results

nat	ure						Q
3	4	a	b	c	d	e	f
g	h	1	j	k	1	m	n
0	р	q	r	S	t	u	v
w	Z	ö					

Search examples:

- bio any title with word 'bio'
- bio* any title with word matching 'bio*' pattern
- *bio* any title with word matching '*bio*' pattern
- *biox* mi* any title with words

Select a Journal title from the list below to launch its dashboa	iro
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- 1. Human Nature
- 2. Nature
- 3. Nature Astronomy
- 4. Nature Biomedical Engineering
- 5. Nature Biotechnology
- 6. Nature Cell Biology
- 7. Nature Chemical Biology
- 8. Nature Chemistry
- 9. Nature Climate Change
- 10. Nature Communications
- 11. Nature Ecology & Evolution
- 12. Nature Energy
- 13. Nature Genetics
- 14. Nature Geoscience
- 15. Nature Human Behaviour
- 16. Nature Immunology
- 17. Nature Materials
- 18. Nature Medicine
- 19. Nature Methods
- 00 Mature Missehiala

 Nature

 Journal ID: 41586

 Note: In order to obtain the raw data for this dashboard please contact the Knowledge Graph team

 PUBLICATION VOLUME
 JOURNAL METRICS

 AUTHORS
 COUNTRIES & INSTITUTIONS

 FIELD OF RESEARCH
 RESEARCH FUNDING

 DATA QUALITY

 Section - Publication Volume

Publication Volume

This section provides statistics useful to understand the type and volume of content linked to a publication.

For example, how many articles have been published over the years, which are the most frequently use article types and how much of this content has been external databases.

- Data Sources: publications metadata have been sourced from DDS (A++ XML) and Content Hub (JATS XML).
- Coverage of external databases: data obtained from automatic checks on third-party sources.

Article - Total number

Article - Count from 2012

Publication Volume



Indexing Status



Journal Metrics



Geographical Patterns

BMC Women's Health

Journal I



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Canada						89	
United Kingdom						81	
Australia						59	
Sweden						50	
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China						29	
Ethiopia						26	
Brazil						25	
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Article - top ten countries distribution as a timeline

100%

United States

Fields of Research over time

You are here: Dashboards Launcher / Journals / Experiments in Fluids

Experiments in Fluids

Journal ID: 348

Note: In order to obtain the raw data for this dashboard please contact the Knowledge Graph team

Article - top 15 Fields of Research (level 1) over time



Research Funding



36

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Current Work

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Known issues are addressed

SN SciGraph: upcoming data release to increase usage

Going native with <u>schema.org</u> and JSONLD

- Integration with de-facto linked data standard on the web
- Quality metadata straight from internal data delivery system
- Millions of links to relevant scholarly objects
 - Grants related to a publication
 - Clinical trials related to a publication
 - Patents related to a publication
 - Policy documents related to a publication
 - Persons (ORCID and Dimensions IDs)
 - Disambiguated Organizations (GRID)

Google

springer book "teaching mindfulness"



All Shopping Videos Images

News More

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About 8,890 results (0.63 seconds)

Teaching Mindfulness - A Practical Guide for Clinicians and ... - Springer www.springer.com/gp/book/9780387094830 •

The first academic text on **teaching mindfulness** across a broad range of professional clinical settings; Written ... About this **book**; About the authors; Reviews.

Teaching Mindfulness: A Practical Guide for Clinicians and Educators ...

https://www.amazon.com/Teaching-Mindfulness-Practical-Clinicians.../1461402409 **Teaching Mindfulness**: A Practical Guide for Clinicians and Educators: 8601405091178: Medicine & Health Science **Books** @ Amazon.com. ... Paperback: 250 pages; Publisher: **Springer**; 2010 edition (June 23, 2011); Language: English ...

Fundamentals of Complementary and Alternative Medicine - E-Book

https://books.google.com/books?isbn=032329894X

Marc S. Micozzi - 2014 - Medical

McCown DM, Reibel D, Micozzi MS: Teaching mindfulness, New York, 2009, Springer. McMahan DL: Repackaging Zen for the West. In Prebish CS, Baumann M ...

About | Mindfulness and More

www.mindfulnessandmore.com/about/ ▼

She is coauthor of the **book Teaching Mindfulness**: A Practical Guide for Clinicians and Educators, a **Springer** publication (2010). Diane is a long-time student of ...

Mindfulness and Buddhist-Derived Approaches in Mental Health and ... https://books.google.com/books?isbn=3319222554

Edo Shonin, William Van Gordon, Mark Griffiths - 2015 - Psychology Competence in **teaching mindfulness**-based courses: Concepts, Development and assessment. Mindfulness ... New York: Bantam **Books**. ... New York: **Springer**.

Training mindfulness teachers > Research Explorer

research.bangor.ac.uk/portal/en/publications/training-mindfulness.../export.html Nov 2, 2016 - Resources for **Teaching Mindfulness**: A cross-cultural and ... **Springer**, 2016. ... UR http://www.**springer**.com/gb/**book**/9783319300986.

Resources for Teaching Mindfulness: An International Handbook



Marc Micozzi books

Medicine books

Beyond the ELK stack: Challenges

Current setup does not scale well (for 1000s of users) esp. when attempting to make it externally available

- UI can be a bit fiddly to use for non tech-savvy colleagues (e.g. filtering)
- Password protection or hiding sensitive data/visualizations can be difficult
- Saving / versioning the visualizations in Kibana requires ad hoc work

(we were using GitHub to save state, but tricky to work with)

- + Need to enable analytics beyond SN on pan-publisher level
- + Add a lot more dynamic data (e.g. citations, usage statistics)

SN Insights & ELK supports QA

SN Insights is powered by Dimensions

Dimensions

Re-imagining discovery and access to research: grants, publications, citations, clinical trials and patents in one place

Dimensior

> RESEARCHER (BETA)

> FUNDER
 > RESEARCH ORGANIZ
 > FIELDS OF RESEARCH

FILTERS

Access free app

Innovative Using data science to place research in its context!	EXTENSIVE 128 million grants, publications, clinical trials and patents with 4 billion connections

https://www.dimensions.ai/

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SN Insights: Sneak Peek

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O Massachusetts Institute of Technology	55	Thi Hoang Duong Nguyen, Jane Tam, Robert A. Wu, Basil J. Greber, Daniel Toso, Eva Nogales, Kathleen Collin	ns		
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O Broad Institute	50	Citations 2 Altmetric 624 🛂 45320 Ø 56 =+ Add to Library		W RESEARCHERS	~
O Massachusetts General Hospital	46			Steven P Gygi	22
Howard Hughes Medical Institute	34	Itaconate is an anti-inflammatory metabolite that activates Nrf2 via alkylation of KEAP1		Harvard University, United States	
Boston Children's Hospital	33	Evanna L. Mills, Dylan G. Ryan, Hiran A. Prag, Dina Dikovskaya, Deepthi Menon, Zbigniew Zaslona, Mark P. Je	drychowski, Ana	Norbert Perrimon Harvard University, United States	13
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Using ELK for internal QA going forward



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Thank you!



How to keep in touch:

 SN SciGraph Product Manager <u>markus.kaindl@springernature.com</u>

 SN SciGraph Portal https://www.springernature.com/scigraph