An answer to Open Science Research Analytics

The case of Sustainable Development Goals

by Tung Tung Chan & Bijan Ranjbar

Erasmus University Rotterdam

What do you want to become when you grow up?

Then: Singer, Nurse, Teacher

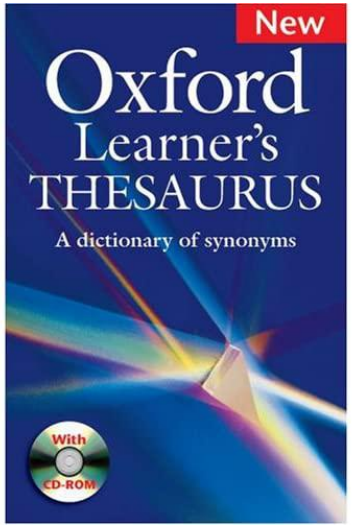
Now: Research Intelligence Advisor and Science, Technology, Society (STS) Scholar.

Lesson: Most of our contributions are not always apparent nor anticipatory. It would be useful to visualise researchers' work in connection with societal challenges/SDGs.

SDGs are targets, not thesaurus.

SUSTAINABLE DEVELOPMENT GOALS

The many SDGs tagging approaches barely encourage researchers to be **more open and involved in reaching these goals** through their work. It will take an entire community to reach these global targets. So what can SDGs policymakers, publishers, tool developers do to foster understanding and inspire action?



What are the questions?

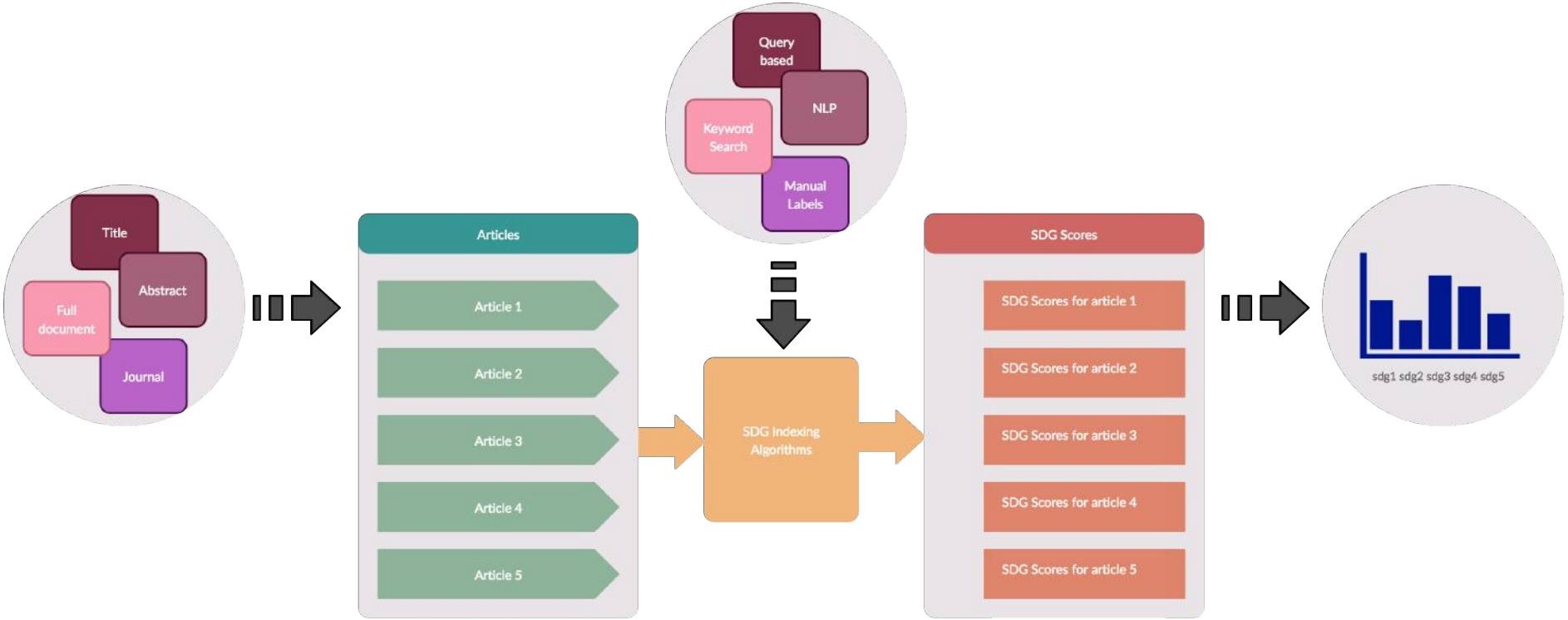
HOW WERE THE SDGS INTERPRETED?

HOW DO WE DELIMIT THE RELEVANCE OF SELECTED APPROACH?

WHO DEVELOPED THE SEARCH STRINGS AND METHODS?

WHAT DATA SOURCES WERE USED?

Armitage, C. S., Lorenz, M., & Mikki, S. (2020). Mapping scholarly publications related to the Sustainable Development Goals: Do independent bibliometric approaches get the same results?. *Quantitative Science Studies, 1*(3), 1092-1108.


Title
Abstract
Full document
Journal
Query based
NLP
Keyword Search
Manual Labels
Articles
Article 1
Article 2
Article 3
Article 4
Article 5
SDG Indexing Algorithms
SDG Scores
SDG Scores for article 1
SDG Scores for article 2
SDG Scores for article 3
SDG Scores for article 4
SDG Scores for article 5
sdg1 sdg2 sdg3 sdg4 sdg5

Goal and non-goal of this presentation

Goal

- To visualise the decision and degree of relevance made by an algorithm – which research and researchers at EUR are contributing to the 17 SDGs

Non goal

- To compare SDG methodologies and approaches

Possible answers offered by Open Science...

Open methodology: facilitate testing, comparison, and stimulate the advancement of methods and tools

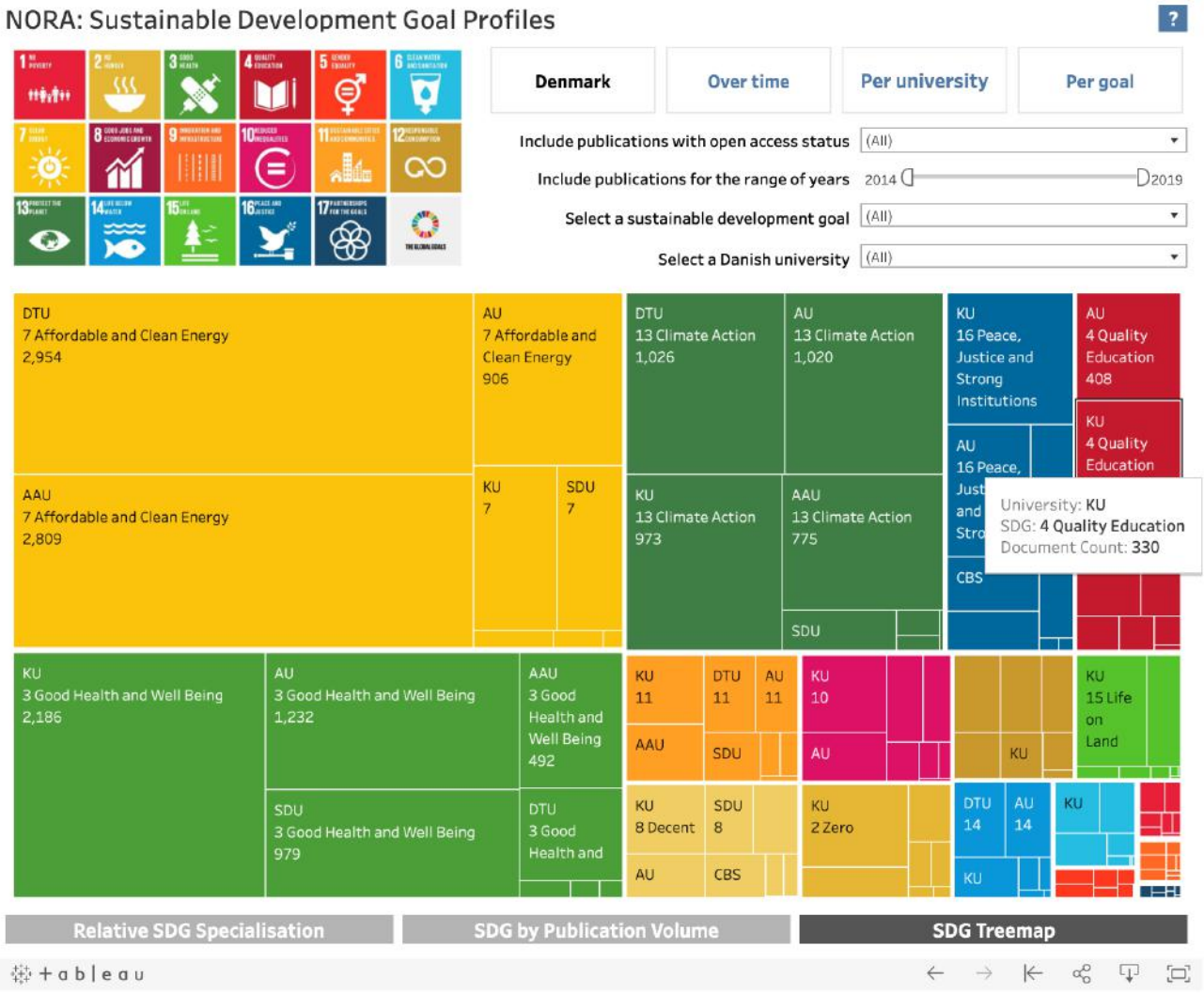
Crowdsourcing: offers a diversity of perspectives, although difficult to reach a consensus.

Non-binary: True/false classification vs. degree/confidence of relevance

The responsibility of assigning SDG relevance: authors, data scientists, policy makers, publishers?

Visualisations from NORA

Erasmus University Rotterdam


NORA: Sustainable Development Goal Profiles
Denmark
Over time
Per university
Per goal
Include publications with open access status
(All)
Include publications for the range of years
2014
2019
Select a sustainable development goal
(All)
Select a Danish university
(All)
DTU
7 Affordable and Clean Energy
2,954
AU
7 Affordable and Clean Energy
906
AAU
7 Affordable and Clean Energy
2,809
KU
7
SDU
7
DTU
13 Climate Action
1,026
AU
13 Climate Action
1,020
KU
13 Climate Action
973
AAU
13 Climate Action
775
SDU
KU
16 Peace, Justice and Strong Institutions
AU
16 Peace,
CBS
AU
4 Quality Education
408
KU
4 Quality Education
University: KU
SDG: 4 Quality Education
Document Count: 330
KU
3 Good Health and Well Being
2,186
AU
3 Good Health and Well Being
1,232
AAU
3 Good Health and Well Being
492
SDU
3 Good Health and Well Being
979
DTU
3 Good Health and
KU
11
DTU
11
AU
11
AAU
SDU
KU
10
AU
KU
KU
15 Life on Land
KU
8 Decent
SDU
8
AU
CBS
KU
2 Zero
DTU
14
AU
14
KU
KU
Relative SDG Specialisation
SDG by Publication Volume
SDG Treemap
+ableau

Tree Map

NORA: Sustainable Development Goal Profiles

Denmark | Over time | Per university | Per goal

Include publications with open access status: (All)

Include publications for the range of years: 2014 – 2019

Select a sustainable development goal: 3 Good Health and Well Being

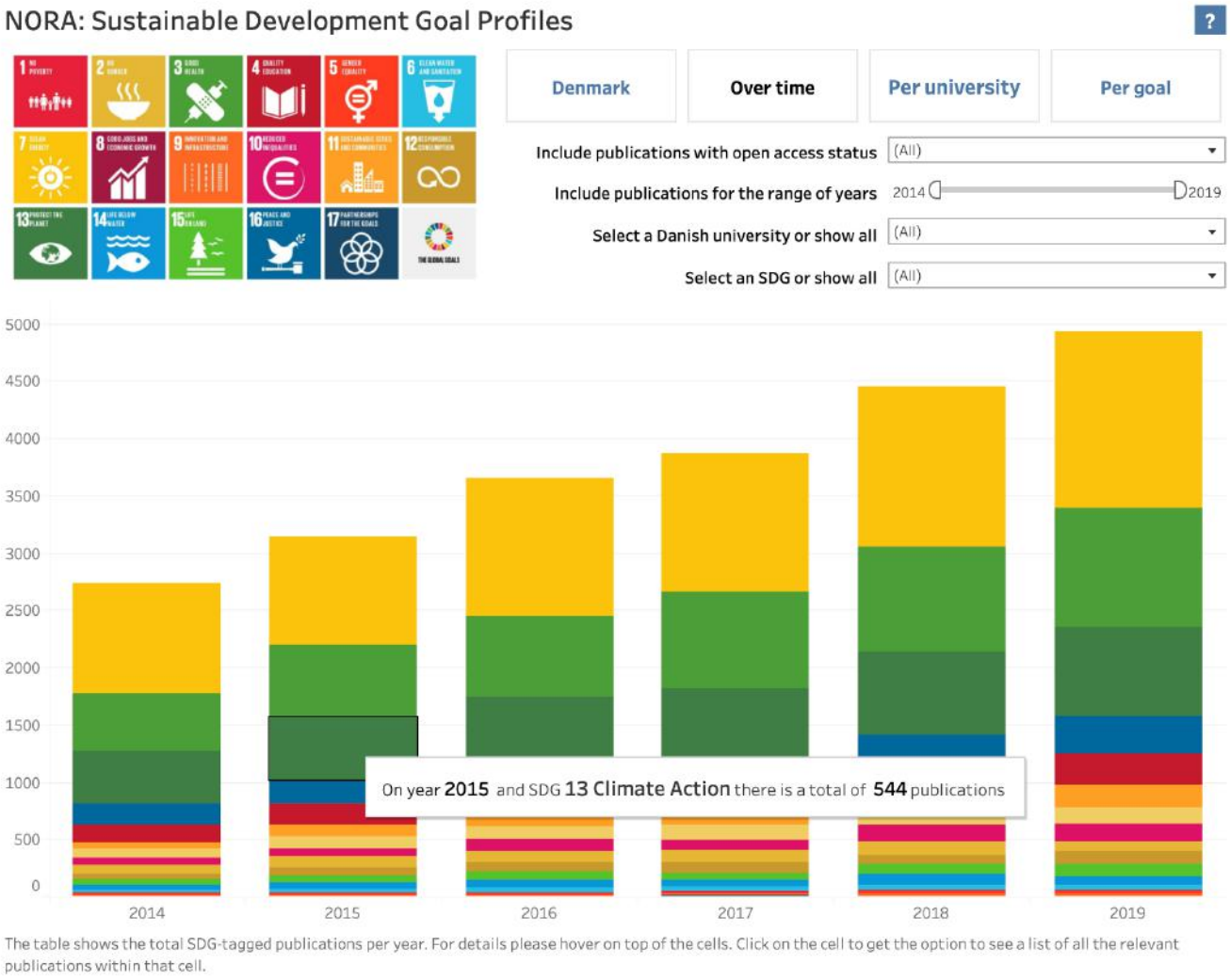
	Grand Total	2014	2015	2016	2017	2018	2019
Denmark	4,630	500	633	706	835	922	1,034
AAU	492	42	63	77	97	103	110
AU	1,232	155	155	173	227	261	261
CBS	17	1		1	7	4	4
DTU	336	32	50	52	47	77	78
ITU	14		2	1	4	3	4
KU	2,186	240	309	336	408	404	489
RUC	31						
SDU	979	98	132	150	148	202	249

On year **2018**, **KU** has **404** publications tagged under SDG **3 Good Health and Well Being**

The table shows the total SDG-tagged publications per year and per university per selected SDG. For details please hover on top of the cells. Click on the cell to get the option to see a list of all the relevant publications within that cell.

+ableau

Table



Trend Analysis

RIxAI (Beta) - EUR - 2015-2020 (OA)

3301 publications

4 topics

6 years

Source: -

Focus: -

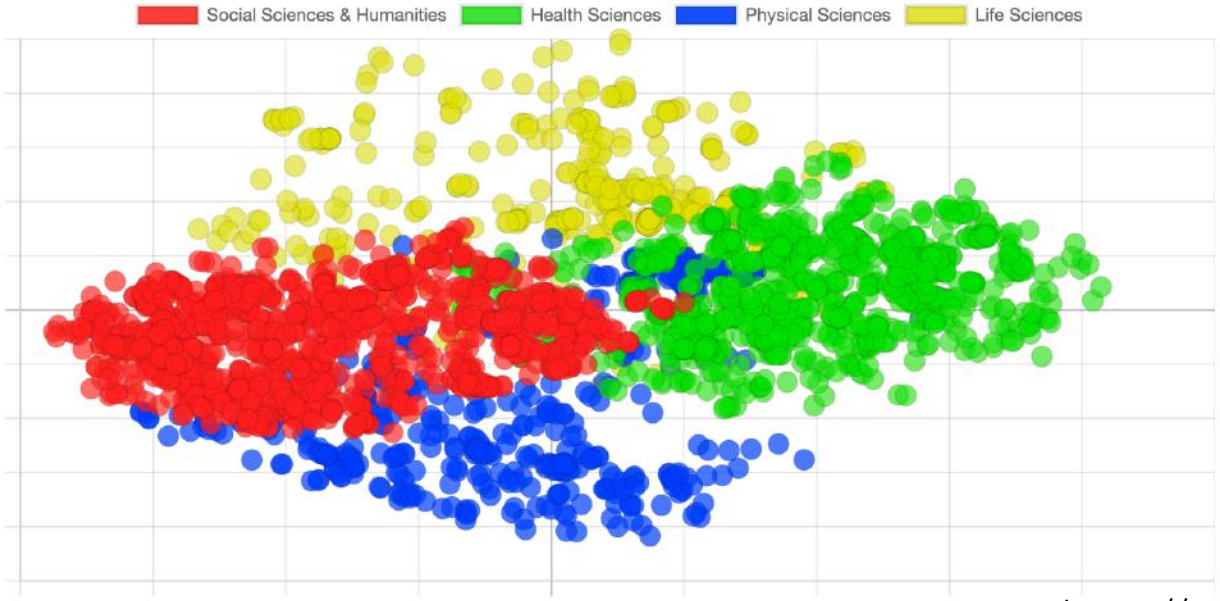
Word: -

Keyword: -

Author: -

Landscape | Trend

SDG: -



https://mydataexpert.nl/rixai-beta/eur-sdg/?p3

Our methodology: Unsupervised SDG classifier

Input and Output

- Open Access journal articles with EUR affiliation from Scopus
- Input: title and abstract from journal article, short description of SDGs from UN
- Output: SDG indexes for each publication

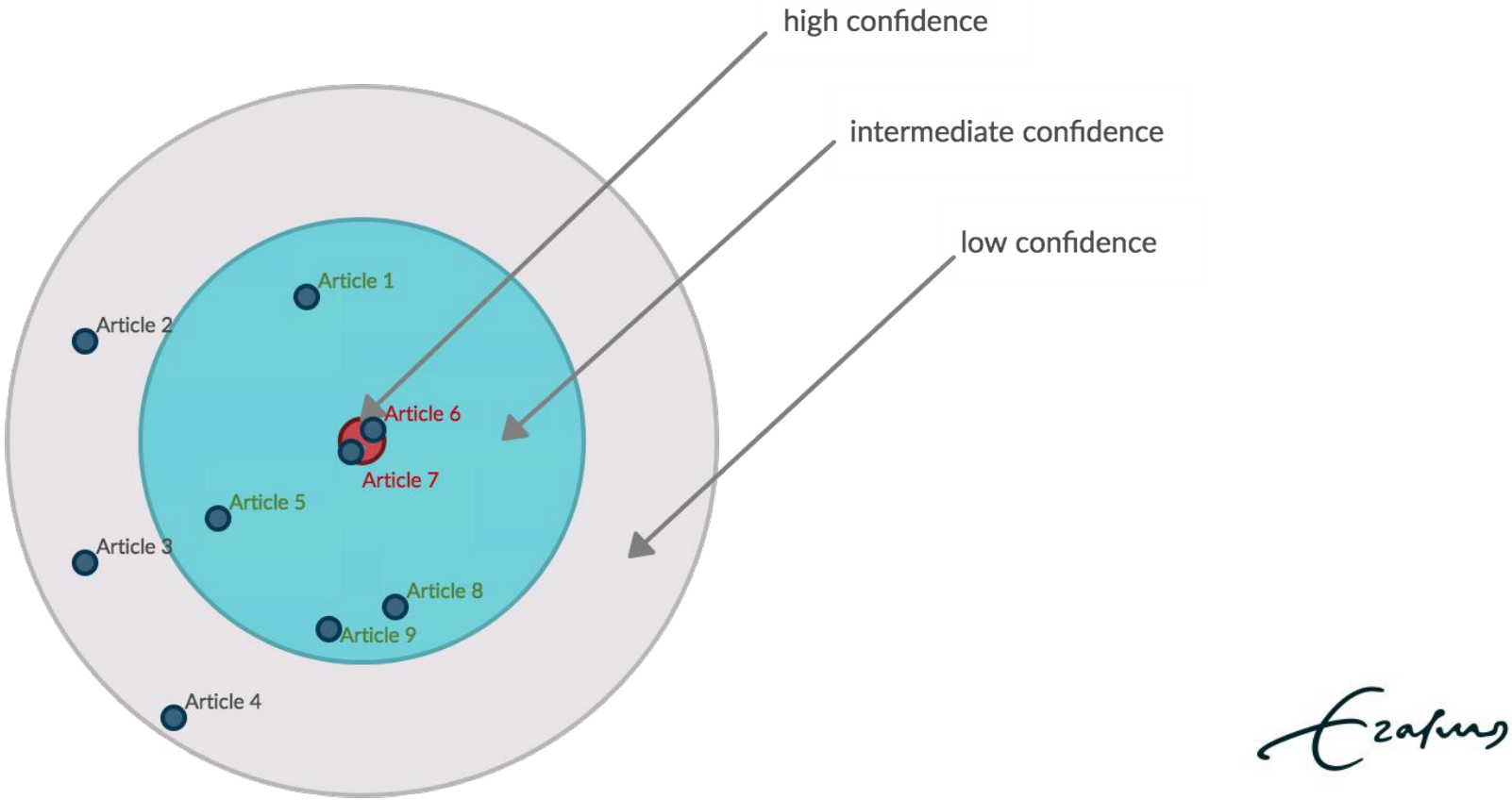
Methodology

- The 'Semantic Similarity' is calculated using a publicly available NLP model called 'Bert-base-uncased' that is fine-tuned on STS benchmark data.
- A normalized version of the calculated similarities can directly be used as the SDG confidence levels

Advantages

- Does not need any manual labels or initial queries
- Able to process human language in a general sense and is capable of detecting new terminology that will appear in the future in the documents
- Very scalable and be applied to large corpora without any limitations

Confidence level in indexing articles w.r.t. to an arbitrary SDG



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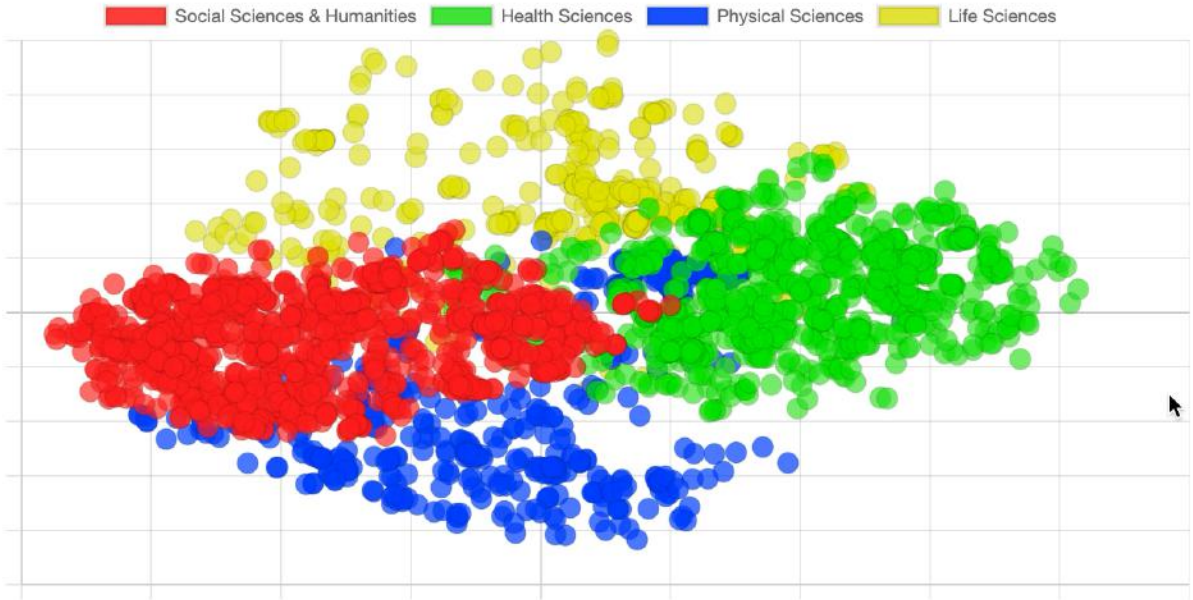

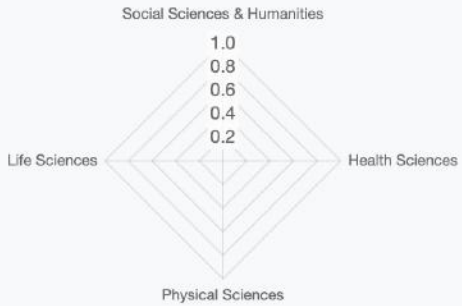

Take home messages

More questions to Open Research Analytics in the case of SDGs:

1. **Visible:** SDGs tagging and methodologies offer specific ways of problematization. Each have their own specific ways of defining, framing and categorising research outputs. How can our tools make this visible?
2. **Accessible:** How can we envision a pluralistic approach to foster new ways of experimenting and novel forms of organizing consensus?
3. **Debatable:** How do we include researchers in debating and assigning SDG relevance?

Thank you!

Questions?

chan@eur.nl