

# Using Big Data Analytics

*to find your Competitive Advantage*

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- What is “Big Data” anyway?
- Is publication data, big data? A look at the scope and complexity of publication data
- How Elsevier uses publication data, and it’s derivatives, to provide fascinating insights
- SciVal Capabilities
  - » High level view of research performance
  - » Competencies: visualize areas of research excellence
  - » Benchmarking
  - » Collaboration
  - » Finding Funding Opportunities
  - » Experts
  - » Analytics
- What purpose does it have?



# Is Scientific Publication Data really Big Data?



Publishing industry, per year:

- >3MM** articles submitted
- 300,000** peer reviewers
- >1.5MM** articles published
- 30MM** readers
- 2B** digital article downloads
- 30MM** article citations

# Elsevier's Broad View of the Global World of Research



**Analysis tools  
which make use of  
Scopus and  
ScienceDirect data**

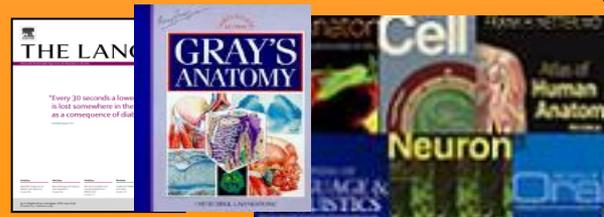
**The worlds largest  
abstract database  
+20,500 journals  
5,000 publishers  
50,000,000 articles**

**Scopus**

**Full-text database of  
Elsevier journals  
11M articles**

**ScienceDirect**

**1 Million+ manuscripts  
submitted to  
2,000 Elsevier journals  
365,000+ articles published  
yearly**



## Scopus

The largest abstract and citation database of peer-reviewed literature.

### 50 million publications

21,000 titles from more than 5,000 international publishers

- 20,000 peer-reviewed journals (including 2,600 open access journals)
- 390 trade publications
- 370 book series
- 5.5 million conference papers

- Scopus data is highly structured data in **XML format**.
- **150+ Data Elements**, each record includes basic meta data, citation counts, keywords, subject areas, index terms, author and affiliation information.
- We index this data ourselves and **calculate** various **derivatives** in our SciVal Products using HPCC.



# Data Types & Complexity SciVal



Publications & Citations

SciVal uses publication data from 1996 which constitutes 30,952,710 publications and 699,818,545 citations

Author Profiles

28 million algorithmically disambiguated author profiles

Institutional profiles

4600 manually validated institutional profiles

Subject Breakdown

27 main subject areas & 330 sub-disciplines

Competency Maps

Co-citation analysis used to create competency maps for each of 223 countries and 4600 institutions

Full Text Downloads

Full Text Download data for 20M Elsevier publications in Science Direct (12,000 customers, 11M users, 600 M downloads per year)

Patents and Patent Citations

89M Patents from LexisNexis Univentio (a Reed Elsevier division) with citation links to publications in Scopus

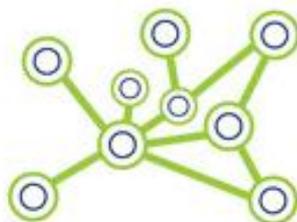
Funding Opportunities

18,000 Funding opportunities from 3000 sponsors

Based on Scopus data



- ① Mine Text
- ② Identify Concepts
- ③ Create Document Fingerprint



- MeSH
- Compendex
- GeoTree
- GESIS
- and more



<b>Disorders</b>
<u>Uterine Cervical Neoplasms</u>
<u>Neoplasms</u>
<u>Breast Neoplasms</u>
<b>Chemicals &amp; Drugs</b>
<u>Biological Tumor Markers</u>
<u>Papillomavirus Vaccines</u>
<u>Aspirin</u>

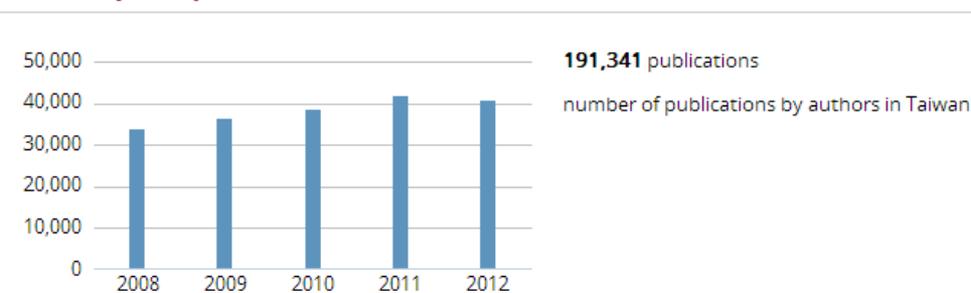
- To further complicate things, Elsevier uses advanced methods to create high quality keywords
- The Elsevier Fingerprint Engine applies a variety of Natural Language Processing (NLP) techniques to mine the text of scientific documents including publication abstracts, funding announcements and awards, project summaries, patents, proposals, applications and other sources
- Key concepts that define the text are identified in thesauri spanning all the major disciplines

# The Fruits of our efforts: SciVal provides analyses of any country, institution, or group of researchers, based on high quality metrics



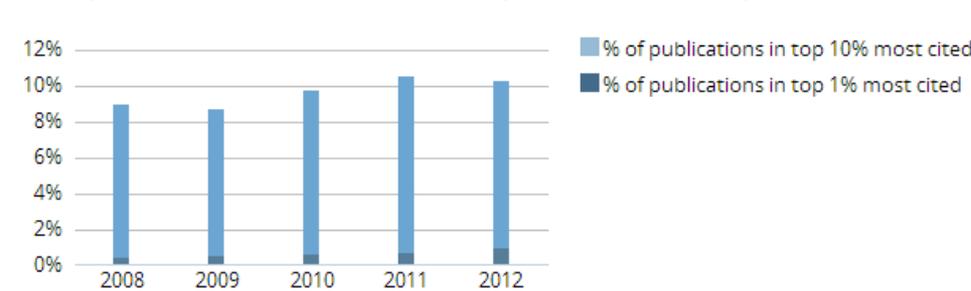
SciVal uses super computing to generate on the fly analyses ~ 75 trillion metric values !!

## Scholarly Output

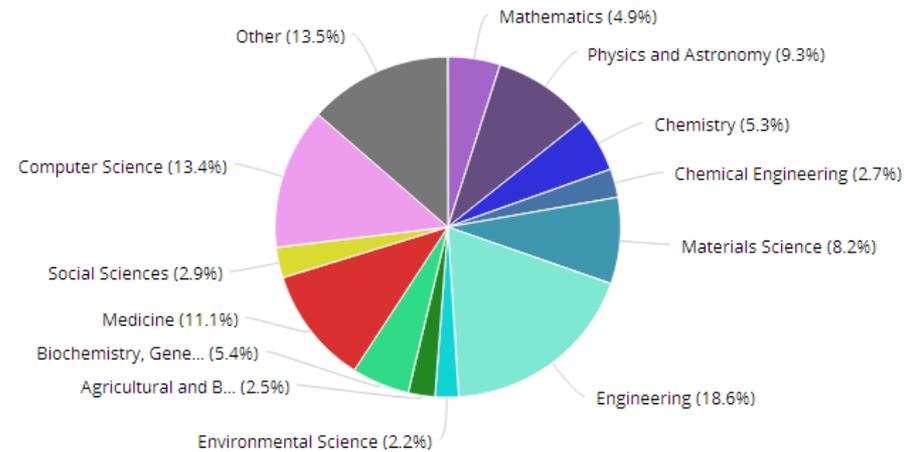


## Outputs in Top Percentiles

Share of publications in Taiwan that are within the top 1% and 10% most cited publications worldwide



## Field-Weighted Citation Impact



## Institutions in Taiwan

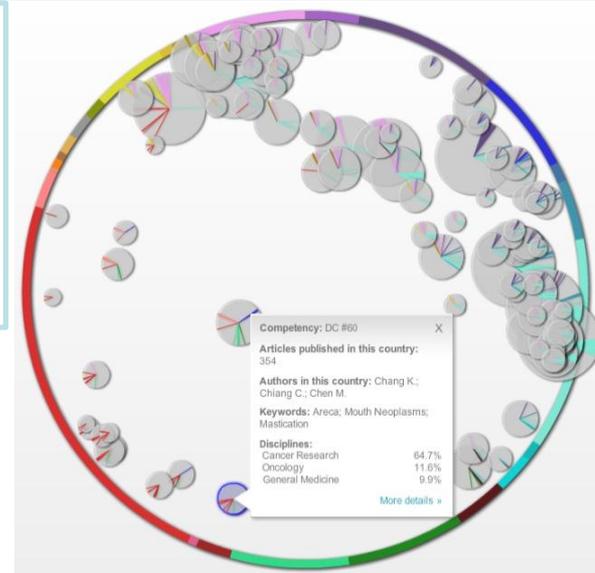
Below is a list of Institutions in Taiwan

Institution	Publications	Citations	Authors
1. National Taiwan University	31,302 ▲	195,802	21,382 ▲
2. National Cheng Kung University	18,919 ▲	93,214	12,660 ▲
3. National Chiao Tung University	13,710 ▲	64,242	8,844 ▲
4. National Tsing Hua University	11,576 ▲	64,817	8,142 ▲
5. Academia Sinica	11,107 ▲	89,694	8,105 ▲
6. Chang Gung University	10,641 ▲	67,682	8,197 ▲
7. National Central University	8,211 ▲	43,542	5,474 ▲
8. National Yang-Ming University	8,003 ▲	51,200	5,413 ▲
9. National Chung Hsing University	7,405 ▲	40,049	5,621 ▲
10. National Sun Yat-sen University	6,812 ▲	31,531	3,964 ▲

# Visualize multidisciplinary areas of Research Excellence

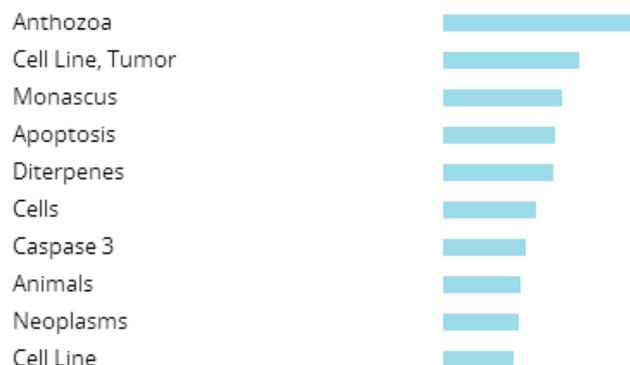


- **Unique to SciVal:** co-citation analysis identifies specific research topics, based on real-life citation behavior
- Maps created for each of 223 countries and 4600 institutions
- Facilitates an understanding of each “competency” as well as exactly which authors and institutions contribute worldwide



## Top keywords for Taiwan

[show all »](#)



## Top authors from Taiwan

[details »](#)

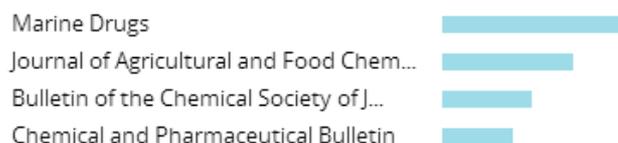


## Top disciplines for Taiwan

[details »](#)



## Top journals for Taiwan



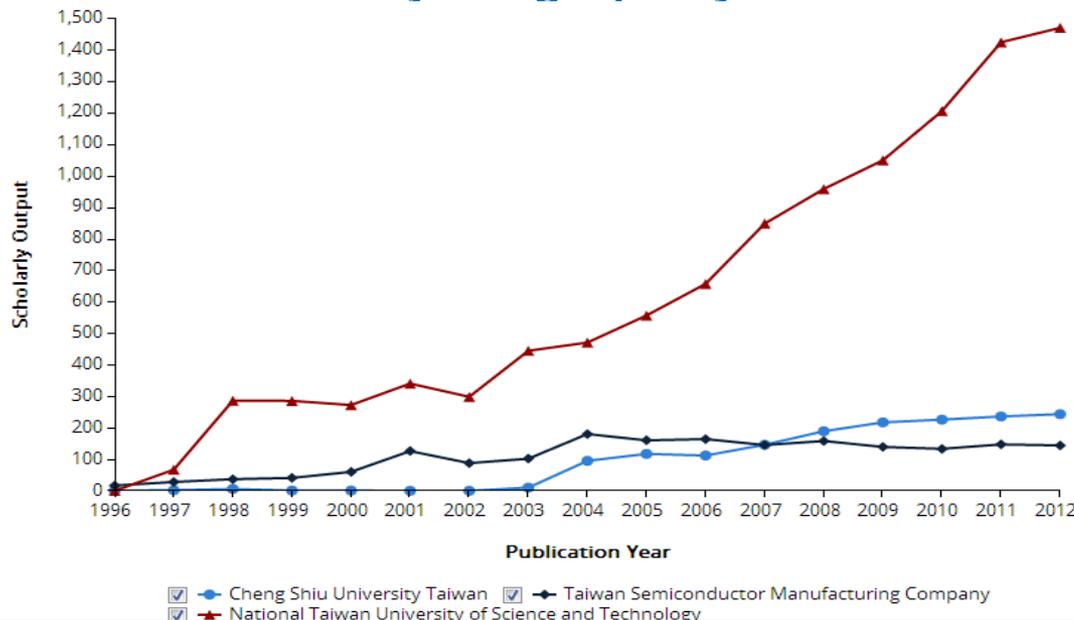
Institution	Articles published in this field
1. <a href="#">China Medical University Taichung</a>	China 245
2. <a href="#">National Sun Yat-sen University</a>	Taiwan 164
3. <a href="#">National Taiwan University</a>	Taiwan 145
4. <a href="#">Asia University Taiwan</a>	Taiwan 123
5. <a href="#">National Dong Hwa University</a>	Taiwan 86
6. <a href="#">Kaohsiung Medical University</a>	Taiwan 95
7. <a href="#">Chang Gung University</a>	Taiwan 78
8. <a href="#">National Chung Hsing University</a>	Taiwan 87
9. <a href="#">Chinese Academy of Sciences</a>	China 69
10. <a href="#">National Research Institute of Chine</a>	Taiwan 39



# Benchmarking: direct comparisons



Analyses can be done for any country, institution, group of researchers based on a variety of high quality metrics researchers.



Citation Count  
Citations per Publication  
Cited Publications  
Collaboration  
Collaboration Impact  
Field-Weighted Citation Impact  
 $h$ -indices  
Journal Category Count  
Journal Count  
Number of Citing Countries  
Outputs in Top Percentiles  
Publications in Top Journal Percentiles  
Scholarly Output

- SciVal facilitates benchmarking of multiple countries, institutions and researchers, based on a sophisticated metrics such as scholarly output volumes, top percentiles, field weighted citation impact and more
- Any research producing country in the world can be selected for inclusion in an analysis
- 4600 institutions can be selected for analysis
- Authors profiles can be used as a starting point to create groups of researchers for inclusion
- All analyses can be broken down by 27 main subject areas and 330 sub-disciplines

- Collaboration can be tracked through co-authorship of publications
- This allows us to analyze volume & impact of specific collaborations
- Collaboration that results in highly cited co-publications may be considered “mutually beneficial”

## 🇺🇸 Collaboration between National Taiwan Normal University and National Taiwan University of Science and Technology 2008 to 2012

### National Taiwan Normal Univ...

15 ▼ co-authors of publications with National Taiwan University ...

#### Total output of this institution

Publications	527
Authors	448
Citations	1,365
Citations per Publication	2.6

22 ▼

co-authored publications  
[View list of publications](#)

193 citations

8.8 citations per publication

### National Taiwan University ...

11 ▲ co-authors of publications with National Taiwan University ...

#### Total output of this institution

Publications	431
Authors	390
Citations	2,620
Citations per Publication	6.1

# Finding Funding Opportunities



## Search results

[Modify this search](#)
[Subscribe to RSS feed](#)
[Save search / Set alert](#)

You searched for: **Stem Cells AND Citizenship( Taiwan X )**

Selected: [Print](#) [Email](#) [Export to Excel](#) [Add to Favorites](#)

< < 1 to 100 >

### Refine your search

Subject area

- All subject areas
- Multidisciplinary (3)
- Medicine and Dentistry (111)
- Biochemistry, Genetics and Molecular Biology (46)
- Social Sciences (20)
- Neuroscience (13)

Show more

Eligibility

- Underrepresented minorities (94)
- ♀ Women (10)
- 👤 Early investigators
- Minimum doctor's degree
- Minimum master's degree

Opportunities (128)		Awarded grants (33,793)		Inactive opportunities (315)		
<input type="checkbox"/>	Deadline	Title	Sponsor	Type	Amount	Currency
<input type="checkbox"/>	1. 31-MAR-2017 <span style="color: green;">●●●</span> Open preview	ARO Core Broad Agency Announcement for Basic and Applied Scientific Research for 15 May 2012 - 31 March 2017	U.S. Department of Defense	Cooperative Agreements/ Contracts	50,000	USD
<input type="checkbox"/>	2. 24-SEP-2014 <span style="color: green;">●●●</span> Open preview	Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Animal Species (R01)	National Institutes of Health	Research Grants	Not Available	N/A
<input type="checkbox"/>	3. 31-MAY-2014 <span style="color: green;">●●●</span> Open preview	Oncology Program RFP: OAK Grant	American Kennel Club Canine Health Foundation	Research Grants	12,000	USD
<input type="checkbox"/>	4. 31-MAY-2014 <span style="color: green;">●●●</span> Open preview	Endocrinology Research Program RFP: OAK Grant	American Kennel Club Canine Health Foundation	Research Grants	12,000	USD

SciVal helps professionals find new funding opportunities. In addition, reviewing award history can create awareness of the funding landscape, along with details of investigators who have successfully won grants in the past.

Home > Mechanical Engineering > Jun Ni

E.g. blood pressure

By Concept By Last Name By Free Text

Jun Ni  
College of Engineering, Mechanical Engineering

Home

Expert Overview

Profile

Publications

Grants

Patents

Similar Experts

Journals

Trends

Institutional Network

Coauthor Network

Research Network

Curriculum Vitae

Jun Ni

**Profile** more >

- Machining
- Machine tools
- Milling (machining)
- Finite element method
- Error compensation
- Mathematical models
- Sheet metal
- Computer simulation
- Wear of materials
- Preventive maintenance
- Electric discharge machining

**Publications** more >

- 2013 Xun Liu; Shuhuai Lan; Jun Ni  
**Experimental study of Electro-Plastic Effect on Advanced High Strength Steels**  
Materials Science and Engineering A. 2013;582:211-218.
- 2013 Peiyun Yi; Linfa Peng; Ning Liu; Xinmin Lai; Jun Ni  
**A micromechanics elastic-plastic constitutive model for sintered stainless steel fiber felt**  
Materials and Design. 2013;51:876-885.
- 2013 Xi Gu; Seungchul Lee; Xinran Liang; Mark Garcellano; Mark Diederichs; Jun Ni  
**Hidden maintenance opportunities in discrete and complex production lines**  
Expert Systems with Applications. 2013;40(11):4353-4361.

**Similar Experts**

Expert	Publications
Jack Hu	236
Albert J Shih	170
Yoram Koren	185
A G Ulsoy	292

**Journals** more >

Journal	Publications
Journal of Manufacturin...	50
International Journal of ...	29
American Society of Mec...	17
American Society of Mec...	11
International Journal of ...	10

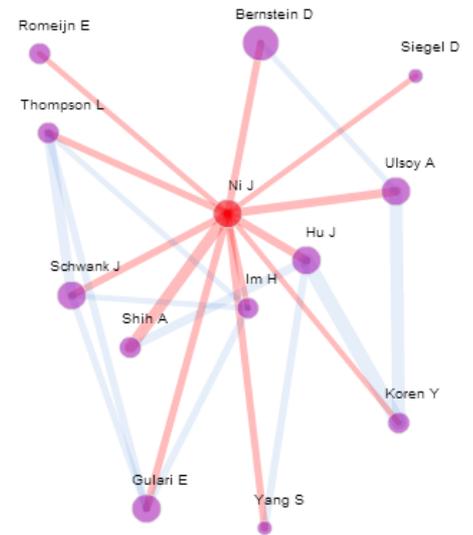
**Trends**

Explore the Research Trends

SciVal Experts showcases the output of a complete institution

Fingerprint technology created high quality keywords to provide valuable insight into subject matter expertise

Similar experts can be identified based on Fingerprints



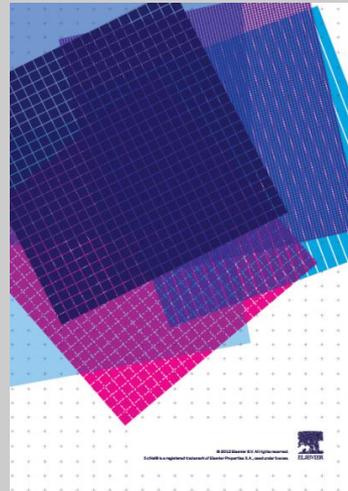
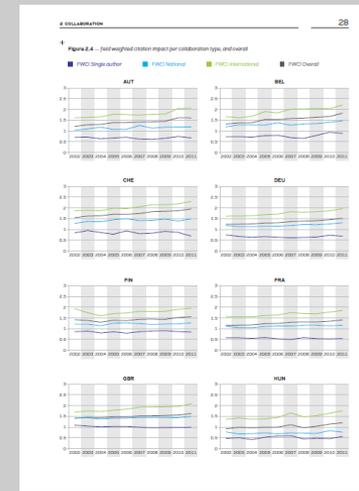
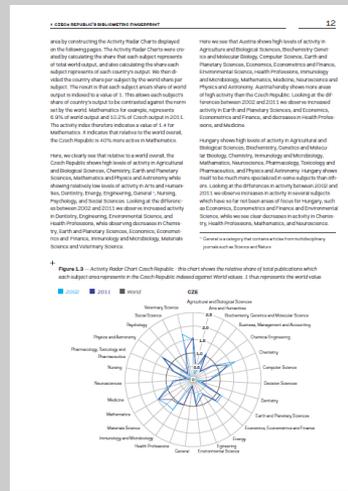
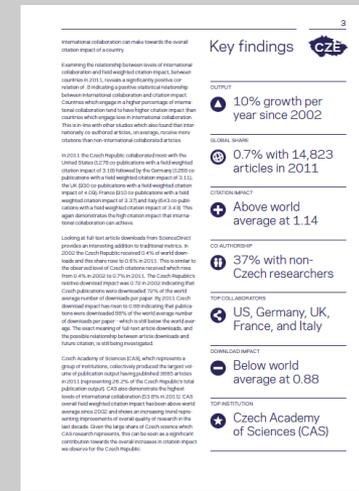
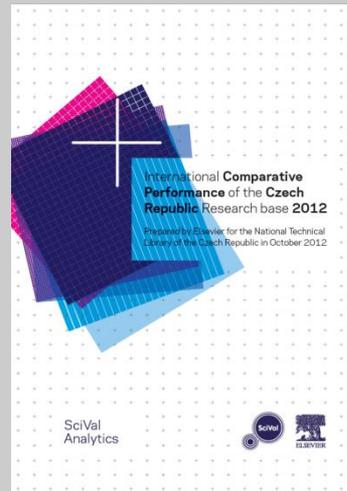
# SciVal Analytics provide Custom Reports and Studies



Not Just Data but Insights!

If you don't have time or expertise to make sense of bibliometric data,

If you need someone to deliver insights based on interpretation of the data, Our reports present data driven key findings and actionable conclusions



# What purpose does it have?



SciVal® helps institutions make more **informed decisions** to drive **research outcomes**.

[www.info.scival.com](http://www.info.scival.com)



Thank you



THANK YOU  
FOR  
WATCHING  
AND  
LISTENING