# Publish or Perish

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# My Background

- Professor on Systems Engineering and Automatic Control

- Research on perception and environment understanding in robotics

- One book and +70 papers co-authored

- +200 papers reviewed for journals and conferences

- +80 papers handled as Associate Editor of the IEEE Transactions on Robotics, IROS, RSS, obtaining reviews and writing recommendations for their publication or rejection

- This presentation reflects my own experience and opinions

**Acknowledgement**

- Thanks to José Neira, Javier Mínguez, Diego Gutiérrez, Eduardo Mena and Javier Campos for their suggestions and comments on this presentation.

# Publish or Perish

Part I: Why, When, Where, How much?

1. Why Publish?
2. When Publish?
3. Where Publish?
   - Journal and Conference Rankings. Impact Factor.
4. How much?
   - Quantity, Quality, Impact
   - Country and Institution Rankings
5. Useful tools
   - ISI web, Google Scholar, PoP, SCImago,...

Part II: How?

1. The publishing process
2. How to write a paper?
3. How to write a review?
4. How to write a rebuttal?
5. Ethical Issues
   - Authorship, Plagiarism, Salami slicing, Conflicts of interest,...

ROBOTICS
UNIVERSIDAD DE ZARAGOZA

# Publish or Perish
## Part I: Why, When, Where, How much?

1. Why Publish?

2. When Publish?

3. Where Publish?

   - Journal and Conference Rankings. Impact Factor.

4. How much?

   - Quantity, Quality, Impact
   - Country and Institution Rankings

5. Useful tools

   - ISI web, Google Scholar, PoP, SCImago,...

# 1. Why Publish?

1. To contribute to the advance of knowledge
   - Publish = make **public** the results of your research
   - Other researchers can build on it

     "If I have seen further it is by standing on the shoulders of giants", Isaac Newton (1676), but the phrase is first attributed to Bernard de Chartres (XII century)

2. To be recognized as the author of an idea
   - Gauss is credited with developing least-squares analysis in 1795, but Legendre was the first to publish the method in 1805

3. To improve your CV
   - "Publish or perish" refers to the pressure to publish work constantly to further or sustain a career in academia.

     See Wikipedia: Publish or Perish
   - OK, but never forget reason #1
   - Avoid "salami slicing" and other misconducts (see part II)

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# Reasons for Not Publishing

## Good reason

- To patent the idea
  - OK, but first patent, and then publish

## Bad reasons

- The idea is still not perfect
  - Don't worry, nothing is perfect
  - If it's solid enough, publish it.
  - Others will use it and improve it
- They will not accept it
  - The only **absolutely necessary** condition is submitting it
- Nobody will read it
  - Learn how to improve your chances (see this and next talk)

# 2. When Publish?

- As soon as possible
  - When you have a **novel** idea, method or result,...
  - you can **claim** some advantages over previous results,...
  - and you have enough **evidence** to support your claims.

- What is enough evidence?
  - A formal proof, for a theoretical result
  - Experimental results, for a new algorithm or method
    - » Mandatory in mature problems, and in some fields: computer vision, graphics,...
    - » If there are standard datasets or benchmarks, use them
  - Simulations can be enough for young problems
    - » In any case, they are useful to analyze the properties of an algorithm: running time, scalability, degradation with noise,...

# 3. Where Publish?

- Conference or Journal?
  - First, Conference
    - » Quick and broad dissemination (in ~6 months)
    - » Get feedback from colleagues
    - » ☹ in Spain **very small** value for your CV
    - » ☹ may be very expensive
  - Then, Journal
    - » More details, results and in-depth discussion
    - » Better review process that will improve your paper
    - » ☹ Delay of 1-2 years in the publishing process
      - Special issues are faster (6-12 months)
    - » Most Journals require additional material over previous conference publications. Check the rules!

# Where Publish?

- ## National conferences?
  - How much did you learn from national conference papers?
  - They typically have very low impact
  - Much less expensive than an international conference
  - Useful to train young researchers in writing papers and performing public presentations
  - Useful to meet your national colleagues
  - But **always** write it in English

# Where Publish?

- Know your research field
- Know the orientation of each journal and conference:
  - Theoretical contributions / Applications and system papers?
  - Incremental advances / Ground-breaking novelties?
- Which are the best journals and conferences in you field?
  - Good papers that you have read
  - Ask your supervisor and colleagues
  - Journal and conference rankings

- My advice: submit to the best places you can
  - It is more likely that you will get good and useful reviews
  - If rejected, listen to the reviewers, improve it, and try again
  - If you tried in a good place, you can always retry in an easier one
  - But don't point too high, try to be realistic about your possibilities

# Journal Rankings: JCR – Impact Factor

- JCR: Journal Citation Reports
  - www.recursoscientificos.fecyt.es  → Acceso WOK  → Journal Citation Reports
  - Systematic review of journal impact and influence
  - Measures yearly the number of citations to journal papers made in other journal papers and **a few** conferences
  - Used as standard reference by Spanish quality agencies: ANECA, ACPUA,...

- Impact Factor: **average** number of cites per year:

$$\frac{\text{cites in year x to recent papers in the journal}}{\text{recent papers in the journal}}$$

recent = published from year x-2 to x-1  (impact factor)

or

published from year x-5 to x-1  (5-year impact factor)

# ISI Web of Knowledge℠

## Journal Citation Reports®

Cites in the same year

### Journal Summary List

Journal Title Changes

Median of cite's age
Indicates long-term
journal influence

Journals from: **subject categories ROBOTICS**   VIEW CATEGORY SUMMARY LIST

Sorted by: Impact Factor   SORT AGAIN

**Journals 1 - 16 (of 16)**    |◄ ◄◄ ◄ [ 1 ] ► ►► ►|    **Page 1 of 1**

MARK ALL   UPDATE MARKED LIST

*Ranking is based on your journal and sort selections.*

| Mark | Rank | Abbreviated Journal Title (linked to journal information) | ISSN | Total Cites | Impact Factor | 5-Year Impact Factor | Immediacy Index | Articles | Cited Half-life | Eigenfactor™ Score | Article Influence™ Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | 1 | IEEE ROBOT AUTOM MAG | 1070-9932 | 764 | 2.090 | 2.500 | 0.139 | 36 | 5.1 | 0.00300 | 0.776 |
| ☐ | 2 | IEEE T ROBOT | 1552-3098 | 6904 | 2.035 | 2.877 | 0.161 | 137 | 10.0 | 0.01198 | 0.943 |
| ☐ | 3 | INT J ROBOT RES | 0278-3649 | 3236 | 1.993 | 2.699 | 0.263 | 76 | 9.4 | 0.00682 | 0.967 |
| ☐ | 4 | J FIELD ROBOT | 1556-4959 | 368 | 1.989 | 2.620 | 0.190 | 42 | 3.0 | 0.00194 | 0.682 |
| ☐ | 5 | ROBOT CIM-INT MANUF | 0736-5845 | 1129 | 1.687 | 1.928 | 0.229 | 96 | 5.6 | 0.00312 | 0.490 |
| ☐ | 6 | BIOINSPIR BIOMIM | 1748-3182 | 121 | 1.367 | 1.410 | 0.160 | 25 | 2.4 | 0.00113 | 0.652 |
| ☐ | 7 | ROBOT AUTON SYST | 0921-8890 | 1526 | 1.361 | 1.650 | 0.130 | 115 | 6.5 | 0.00383 | 0.451 |
| ☐ | 8 | AUTON ROBOT | 0929-5593 | 1215 | 1.235 | 2.080 | 0.175 | 40 | 7.5 | 0.00269 | 0.646 |
| ☐ | 9 | INT J HUM ROBOT | 0219-8436 | 224 | 1.230 | | 0.071 | 28 | 4.0 | 0.00120 | |
| ☐ | 10 | IND ROBOT | 0143-991X | 401 | 1.000 | 0.836 | 0.066 | 61 | 5.0 | 0.00108 | 0.190 |
| ☐ | 11 | ROBOTICA | 0263-5747 | 912 | 0.992 | 1.117 | 0.146 | 96 | 6.5 | 0.00246 | 0.328 |
| ☐ | 12 | J BIONIC ENG | 1672-6529 | 171 | 0.972 | | 0.283 | 53 | 2.1 | 0.00086 | |
| ☐ | 13 | J INTELL ROBOT SYST | 0921-0296 | 568 | 0.858 | 0.801 | 0.000 | 80 | 7.0 | 0.00140 | 0.234 |
| ☐ | 14 | ADV ROBOTICS | 0169-1864 | 486 | 0.629 | 0.800 | 0.035 | 115 | 5.2 | 0.00162 | 0.229 |
| ☐ | 15 | INT J ROBOT AUTOM | 0826-8185 | 144 | 0.339 | 0.438 | 0.029 | 35 | 7.1 | 0.00041 | 0.135 |
| ☐ | 16 | REV IBEROAM AUTOM IN | 1697-7912 | 25 | 0.291 | | 0.026 | 39 | | 0.00012 | |

JCR Data ⓘ    Eigenfactor™ Metrics ⓘ

MARK ALL   UPDATE MARKED LIST

# Journal Rankings: JCR – Impact Factor

- Impact factor varies a lot between research fields, and between years
  - Examples of maximum IF:
    - » Robotics (2009): 2.090 ; (2010): 4.095
    - » Computer Science: Software Engineering (2009): 3.750
    - » Biology (2009): 12.916
- Better analyze the position within the subject category
    - » Example: Quartile Q2 in Biology
      or  Position 24/76 in Biology
- Used as standard reference by most evaluation agencies in Spain: ANECA, ACPUA,...
  - For researcher accreditations and incentives
  - For institutional evaluations

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# Other Journal Rankings

- Eigenfactor: http://www.eigenfactor.org/
  - Based on the PageRank algorithm used by Google to rank web pages
  - Imagine that a researcher goes to the library and selects a journal article at random. After reading the article, the researcher selects at random one of the citations from the article, proceeds to the journal that was cited, selects an article at random in that journal and repeats ad infinitum.
  - With probability 1-$\alpha$ (typically $\alpha$ = 0.85) the researcher gets bored and jumps to a random article.
  - The amount of time spent with each journal gives a measure of that journal's importance.

- SJR: SCImago Journal Rank   http://www.scimagojr.com/
  - Also based on PageRank, with slightly different implementation details

# Open Access Journals

Three schemes

- Open access journals *(Gold Open Access)*
    - Don't charge readers for accessing the papers
    - Authors pay the cost of publishing
        - » Range:  $0 - $5000 / paper
        - » Typical: $300 - $1200 / paper

- Hybrid Journals *(Gold Open Access)*
    - Charge readers for accessing the papers
    - But authors can pay to give free access to their papers
    - Example: most IEEE Transactions  www.ieee.org/open-access

- Traditional Journals *(Green Open Access)*
    - Most allow to post on institutional or public repositories the **accepted** version of their papers, not the **final** version (ex: IEEE)
    - http://www.ieee.org/publications_standards/publications/rights/paperversionpolicy.html

# Open Access Journals

- ## Scientific publishing is moving to open access
  - More that 50% of new research in available free online
  - US government 2013: all papers developed with public funds should be of free access within 12 months
  - EU Commission 2014: free access within 6-12 months
  - Ley 14/2011 de la Ciencia, Art. 37: free access within 12 months

- ## Publish in Open Access journals?
  - Most offer very fast reviews
  - Some are junk: no serious review process
  - Some are scams: just trying to get author's money
  - If not ranked in JCR, forget about them!

# Conference Rankings

- Spanish evaluation agencies tend to ignore conference papers, unless you proof they are exceptionally good

- Computer Science Conference Rankings:
  - CORE: http://www.core.edu.au/index.php/conference-portal
    - » Ranks: A*, A, B, C
  - SCIE: http://gii-grin-scie-rating.scie.es/
    - » Ranks: (1) A++, A+, (2) A, A-, (3) B, B-

- SCImago Journal Rank includes some conferences, allowing to compare their impact with journals

- If everything else fails, low acceptance rate (<=30%) can be an (unreliable) indicator of conference quality

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# 4. How Much?

- In Spain, researchers are periodically evaluated:
  - "Acreditación" to get a lecturer or professor position
  - "Sexenios de investigación": Salary incentives every 6-year

- Evaluation agencies:
  - CNEAI: Comisión Nacional Evaluadora de la Actividad Investigadora (Sexenios)
  - ANECA: Agencia Nacional de Evaluación de la Calidad y Acreditación (Acreditaciones)
  - ACPUA: Agencia de Calidad y Prospectiva Universitaria de Aragón (Acreditaciones)
  - ....

# How are researchers evaluated?

- Publications is always the most important part
- "Acreditación" (ANECA), in technological areas:

| | Ayudante Doctor | Contratado Doctor | Titular Universidad | Catedrático Universidad |
|---|---|---|---|---|
| **Research Experience** | **60%** | **60%** | **50%** | **55%** |
|  - **Publications** | **47%** | **37%** | **30-35%** | **30-37%** |
|  - Research Projects | 9% | 12% | 7% | 10% |
|  - Patents & Know.Transfer | | 6% | 4-9% | 5-12% |
|  - Other research activities | 4% | 5% | 4% | 3% |
| Teaching Experience | 21% | 30% | 40% | 35% |
| Education | 14% | 8% | 5% | |
| Management and Other | 5% | 2% | 5% | 10% |
| **Acceptance Threshold** | **55%** | **55%** | **65%** | **80%** |
| **Typical # of JCR papers required in Technology** ** | **2-3** | **4-6** | **6-10** | **12-20** |

Changed In 2016

**Estimated values, use them at your own risk
- First value: number of **very good** JCRs: Q1 or highly cited
- Last value: number of standard JCRs: Q2-Q4

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# How are researchers evaluated?

- Acreditación (ANECA-2017):

A: Exceptional
B: Good
C: Compensable

|  | Titular Universidad | | | | | Catedrático Universidad | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Research Experience | B | A | C | | | B | A | C | | |
| 2. Teaching Experience | B | C | C | | | B | C | C | | |
| 3. Education | | B | B | | | - | - | - | | |
| 4. Knowledge Transfer | | | A/B | | | | | A/B | | |
| 5. Management | | | A/B | | | | | A/B | | |

| Min. Requirements in Research Experience | Computer Science | | | | Electr. Eng. & Telecomm. | | | |
|---|---|---|---|---|---|---|---|---|
| | TU-B | TU-A | CU-B | CU-A | TU-B | TU-A | CU-B | CU-A |
| Minimum #JCR | 12 | 24 | 28 | 50 | 12 | 30 | 30 | 60 |
| Minimum Quality Q1/Q2 | 6 | 12 | 14 | 25 | 8 | 20 | 20 | 40 |
| Includes Conferences? | Yes* | Yes* | Yes* | Yes* | No | No | No | No |

(*) http://gii-grin-scie-rating.scie.es/: A++, A+ = Q1/Q2;  A, A- = Q3/Q4

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# How are researchers evaluated?

- Sexenios de Investigación (6-year periods):
  - Salary incentive based on a 6-year research period
  - If you miss one, it's gone forever
  - Used as requirement in many other places. Some examples:
    - 1 to be PhD advisor or member in a PhD jury
    - 2 to be member of an accreditation committee for Assoc. Prof.
    - 3 to be member of an accreditation committee for Full Prof.

- Evaluation is mostly based on your 5 best results:
  - Ing. de la Comunicación, Computación y Electrónica (Dic 2017):
    - A) Major relevance: JCR Q1/Q2, International Patent
    - B) Enough relevance: JCR Q3, Nat. Patent, Some Conferences (max. 2)
    - C) Small relevance: JCR Q4, Some conferences
    - Minimum Requirement: 2 A + 1 B, or 1 A + 3 B
    - For conferences: Raking CORE or SCIE

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# How to measure author productivity?

- Quantity
  - Number of Publications
    » But there are too many conferences and journals that nobody reads
  - Number of Publications in JCR Journals
    » From 1989, when sexenios started, the number of JCR papers written in Spain has increased dramatically
    » But their impact has not grown at the same pace
- Quality
  - Number of Publications in the best JCR Journals (Q1-Q2)
    » But the IF measures the **average impact** of a journal, not the true impact of a paper or a researcher.

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# How to measure author impact?

- Number of Citations
  - A single paper with many citations does not reflect a sustained scientific production
  - Survey papers can easily distort the result

- H-index:
  - A h-index of $h$ means that a researcher (or group of researchers) has published $h$ **papers** that have **>=$h$ citations each**
  - Does not favor neither prolific authors with low impact, nor isolated papers with many citations.
  - Adequate to compare researchers of the same age, institutions or countries, **within the same discipline**
  - Easy to obtain with SCI o Google Scholar (Very different values!)
    - » J.E. Hirsch: "An index to quantify an individual's scientific research output", Proceedings of the National Academy of Sciences, vol. 102, no. 46, 16569–16572, November 15, 2005

# How to have scientific impact?

- ## Work on an interesting problem
  - If nobody knows the problem, nobody will read about it
  - Try to find the "hot topics" in your research area
  - But it is harder: let a good idea sleep for 6 months, and there are good chances that someone else will publish it.

- ## Do good work
  - Don't get worried, get busy
  - Write down your results, a good report will become a good paper
  - Submit papers to good conferences and journals
  - Persevere, persevere, persevere

- ## Talk about it
  - Attend and present at good conferences. Discuss with people.
  - Do research stays in good labs. Write joint papers (6 months).

# Country Ranking (SCImago, 1996-2013)

- Spain: #10 in number of Papers, #11 in Citations

| | Country | Documents | Citable documents | Citations | Self-Citations | Citations per Document | H index |
|---|---|---|---|---|---|---|---|
| 1 | United States | 7.846.972 | 7.281.575 | 152.984.430 | 72.993.120 | 22,02 | 1.518 |
| 2 | China | 3.129.719 | 3.095.159 | 14.752.062 | 8.022.637 | 6,81 | 436 |
| 3 | United Kingdom | 2.141.375 | 1.932.907 | 37.450.384 | 8.829.739 | 19,82 | 934 |
| 4 | Germany | 1.983.270 | 1.876.342 | 30.644.118 | 7.966.777 | 17,39 | 815 |
| 5 | Japan | 1.929.402 | 1.874.277 | 23.633.462 | 6.832.173 | 13,01 | 694 |
| 6 | France | 1.421.190 | 1.348.769 | 21.193.343 | 4.815.333 | 16,85 | 742 |
| 7 | Canada | 1.110.886 | 1.040.413 | 18.826.873 | 3.580.695 | 20,05 | 725 |
| 8 | Italy | 1.083.546 | 1.015.410 | 15.317.599 | 3.570.431 | 16,45 | 654 |
| 9 | India | 868.719 | 825.025 | 5.666.045 | 1.957.907 | 8,83 | 341 |
| 10 | Spain | 857.158 | 800.214 | 10.584.940 | 2.629.669 | 15,08 | 531 |
| 11 | Australia | 782.149 | 723.460 | 11.447.009 | 2.449.459 | 18,24 | 583 |
| 12 | South Korea | 658.602 | 642.983 | 5.770.844 | 1.281.366 | 11,49 | 375 |
| 13 | Russian Federation | 639.598 | 629.671 | 3.664.726 | 1.088.981 | 6,00 | 355 |
| 14 | Netherlands | 614.552 | 574.144 | 12.103.482 | 2.003.644 | 23,03 | 636 |
| 15 | Brazil | 529.841 | 510.194 | 4.164.813 | 1.415.014 | 10,98 | 342 |
| 16 | Taiwan | 446.282 | 434.662 | 3.993.380 | 930.383 | 11,35 | 300 |
| 17 | Switzerland | 445.163 | 419.372 | 9.238.679 | 1.261.471 | 24,53 | 629 |
| 18 | Sweden | 417.156 | 397.095 | 8.069.960 | 1.267.282 | 21,76 | 567 |
| 19 | Poland | 387.982 | 378.483 | 2.939.536 | 768.212 | 8,93 | 336 |
| 20 | Turkey | 348.836 | 330.411 | 2.417.631 | 624.695 | 9,07 | 237 |

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# Country Ranking (SCImago, 1996-2013)

- Spain-Computer Science: #10 in Papers, #11 in Citations

| | Country | Documents | Citable documents | Citations | Self-Citations | Citations per Document | H index |
|---|---|---|---|---|---|---|---|
| 1 | United States | 674.876 | 660.385 | 6.863.682 | 2.098.285 | 12,10 | 588 |
| 2 | China | 533.724 | 530.256 | 1.195.832 | 570.771 | 3,90 | 189 |
| 3 | Japan | 170.877 | 168.377 | 645.155 | 166.574 | 4,79 | 171 |
| 4 | Germany | 170.090 | 166.330 | 1.039.985 | 218.161 | 8,54 | 235 |
| 5 | United Kingdom | 159.312 | 154.399 | 1.269.899 | 231.099 | 10,47 | 267 |
| 6 | France | 132.068 | 129.571 | 823.842 | 183.243 | 8,82 | 224 |
| 7 | Canada | 110.523 | 107.989 | 859.973 | 128.162 | 10,32 | 233 |
| 8 | Italy | 98.727 | 96.022 | 628.951 | 140.139 | 8,78 | 194 |
| 9 | South Korea | 92.957 | 91.526 | 394.934 | 68.034 | 6,17 | 146 |
| 10 | Spain | 84.041 | 82.127 | 434.934 | 108.506 | 7,97 | 161 |
| 11 | Taiwan | 83.238 | 81.978 | 457.728 | 109.171 | 8,14 | 155 |
| 12 | India | 80.013 | 79.018 | 283.005 | 49.560 | 7,55 | 132 |
| 13 | Australia | 69.835 | 67.978 | 443.081 | 61.258 | 9,53 | 177 |
| 14 | Netherlands | 49.674 | 48.229 | 414.325 | 61.569 | 11,73 | 187 |
| 15 | Singapore | 35.950 | 35.210 | 263.852 | 30.829 | 9,37 | 139 |
| 16 | Brazil | 35.778 | 35.064 | 138.660 | 30.311 | 6,21 | 106 |
| 17 | Hong Kong | 35.287 | 34.465 | 326.640 | 35.334 | 11,34 | 162 |
| 18 | Russian Federation | 35.122 | 34.921 | 78.095 | 14.900 | 2,31 | 79 |
| 19 | Switzerland | 33.448 | 32.550 | 334.256 | 37.482 | 14,21 | 181 |
| 20 | Poland | 33.347 | 32.793 | 128.336 | 33.507 | 5,61 | 95 |

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# Country Ranking (SCImago, 1996-2013)

- Spain: #20 in Citations per Paper: avg = 15,08

| | Country | Documents | Citable documents | Citations | Self-Citations | Citations per Document | H index |
|---|---|---|---|---|---|---|---|
| 1 | Switzerland | 445.163 | 419.372 | 9.238.679 | 1.261.471 | 24,53 | 629 |
| 2 | Denmark | 234.852 | 221.544 | 4.653.794 | 670.279 | 23,38 | 476 |
| 3 | Netherlands | 614.552 | 574.144 | 12.103.482 | 2.003.644 | 23,03 | 636 |
| 4 | United States | 7.846.972 | 7.281.575 | 152.984.430 | 72.993.120 | 22,02 | 1.518 |
| 5 | Sweden | 417.156 | 397.095 | 8.069.960 | 1.267.282 | 21,76 | 567 |
| 6 | Canada | 1.110.886 | 1.040.413 | 18.826.873 | 3.580.695 | 20,05 | 725 |
| 7 | Finland | 212.195 | 204.004 | 3.677.439 | 583.752 | 19,94 | 407 |
| 8 | United Kingdom | 2.141.375 | 1.932.907 | 37.450.384 | 8.829.739 | 19,82 | 934 |
| 9 | Belgium | 335.160 | 316.462 | 5.658.300 | 820.146 | 19,68 | 502 |
| 10 | Israel | 247.561 | 234.696 | 4.346.150 | 607.046 | 19,29 | 456 |
| 11 | Norway | 183.463 | 172.258 | 2.802.491 | 452.749 | 18,83 | 362 |
| 12 | Australia | 782.149 | 723.460 | 11.447.009 | 2.449.459 | 18,24 | 583 |
| 13 | Austria | 241.610 | 227.014 | 3.668.207 | 505.720 | 18,04 | 416 |
| 14 | Ireland | 119.983 | 111.434 | 1.647.369 | 196.295 | 17,85 | 299 |
| 15 | Germany | 1.983.270 | 1.876.342 | 30.644.118 | 7.966.777 | 17,39 | 815 |
| 16 | New Zealand | 146.264 | 135.988 | 2.084.166 | 327.237 | 17,20 | 318 |
| 17 | France | 1.421.190 | 1.348.769 | 21.193.343 | 4.815.333 | 16,85 | 742 |
| 18 | Italy | 1.083.546 | 1.015.410 | 15.317.599 | 3.570.431 | 16,45 | 654 |
| 19 | Hong Kong | 180.958 | 172.610 | 2.448.025 | 340.370 | 15,53 | 325 |
| 20 | Spain | 857.158 | 800.214 | 10.584.940 | 2.629.669 | 15,08 | 531 |

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# Country Ranking (SCImago, 1996-2013)

- Spain-Computer Science: #24 in Cites/Paper: 7,97

| | Country | Documents | Citable documents | Citations | Self-Citations | Citations per Document | H index |
|---|---|---|---|---|---|---|---|
| 1 | Switzerland | 33.448 | 32.550 | 334.256 | 37.482 | 14,21 | 181 |
| 2 | Israel | 26.630 | 26.131 | 288.961 | 37.453 | 13,54 | 177 |
| 3 | Belgium | 28.221 | 27.582 | 242.671 | 32.611 | 12,34 | 153 |
| 4 | United States | 674.876 | 660.385 | 6.863.682 | 2.098.285 | 12,10 | 588 |
| 5 | Denmark | 16.319 | 15.812 | 125.395 | 15.172 | 11,78 | 121 |
| 6 | Sweden | 30.412 | 29.838 | 250.308 | 31.667 | 11,78 | 142 |
| 7 | Netherlands | 49.674 | 48.229 | 414.325 | 61.569 | 11,73 | 187 |
| 8 | Hong Kong | 35.287 | 34.465 | 326.640 | 35.334 | 11,34 | 162 |
| 9 | Austria | 25.333 | 24.574 | 158.461 | 24.469 | 10,89 | 119 |
| 10 | United Kingdom | 159.312 | 154.399 | 1.269.899 | 231.099 | 10,47 | 267 |
| 11 | Canada | 110.523 | 107.989 | 859.973 | 128.162 | 10,32 | 233 |
| 12 | Australia | 69.835 | 67.978 | 443.081 | 61.258 | 9,53 | 177 |
| 13 | New Zealand | 11.174 | 10.895 | 67.037 | 7.874 | 9,52 | 95 |
| 14 | Norway | 14.037 | 13.642 | 84.156 | 12.481 | 9,46 | 96 |
| 15 | Singapore | 35.950 | 35.210 | 263.852 | 30.829 | 9,37 | 139 |
| 16 | Finland | 25.259 | 24.826 | 159.641 | 24.387 | 9,37 | 124 |
| 17 | France | 132.068 | 129.571 | 823.842 | 183.243 | 8,82 | 224 |
| 18 | Italy | 98.727 | 96.022 | 628.951 | 140.139 | 8,78 | 194 |
| 19 | Turkey | 22.979 | 22.597 | 135.249 | 23.776 | 8,67 | 102 |
| 20 | Ireland | 14.400 | 14.044 | 81.543 | 8.671 | 8,64 | 92 |
| 21 | Germany | 170.090 | 166.330 | 1.039.985 | 218.161 | 8,54 | 235 |
| 22 | Taiwan | 83.238 | 81.978 | 457.728 | 109.171 | 8,14 | 155 |
| 23 | Greece | 28.451 | 27.567 | 162.400 | 28.379 | 8,09 | 112 |
| 24 | Spain | 84.041 | 82.127 | 434.934 | 108.506 | 7,97 | 161 |
| 25 | India | 80.013 | 79.018 | 283.005 | 49.560 | 7,55 | 132 |

# Shanghai University Ranking (2014)

| Rank Mundial | Institución* | País/Región | Rank Nacional | Puntuación Total | Puntuación en Alumni ▼ |
|---|---|---|---|---|---|
| 1 | Universidad de Harvard | 🇺🇸 | 1 | 100 | 100 |
| 2 | Universidad de Stanford | 🇺🇸 | 2 | 72.1 | 41.8 |
| 3 | Instituto de Tecnología de Massachusetts | 🇺🇸 | 3 | 70.5 | 68.4 |
| 4 | Universidad de California-Berkeley | 🇺🇸 | 4 | 70.1 | 66.8 |
| 5 | Universidad de Cambridge | 🇬🇧 | 1 | 69.2 | 79.1 |
| 6 | Universidad de Princeton | 🇺🇸 | 5 | 60.7 | 52.1 |
| 7 | Instituto de Tecnología de California | 🇺🇸 | 6 | 60.5 | 48.5 |
| 8 | Universidad de Columbia | 🇺🇸 | 7 | 59.6 | 65.1 |
| 9 | Universidad de Chicago | 🇺🇸 | 8 | 57.4 | 61.4 |
| 9 | Universidad de Oxford | 🇬🇧 | 2 | 57.4 | 51 |
| 11 | Universidad de Yale | 🇺🇸 | 9 | 55.2 | 48.8 |
| 12 | Universidad de California, Los Ángeles | 🇺🇸 | 10 | 51.9 | 30.2 |
| 13 | Universidad de Cornell | 🇺🇸 | 11 | 50.6 | 37.6 |
| 14 | Universidad de California, San Diego | 🇺🇸 | 12 | 49.3 | 19.7 |
| 15 | Universidad de Washington | 🇺🇸 | 13 | 48.1 | 21.7 |
| 401-500 | Universidad de Zaragoza | 🇪🇸 | 9-12 | | 0 |

*Ranking | Metodología | Estadística*

*Juan D. Tardós, University of Zaragoza, Spain*

# Shanghai University Ranking (2014)

| | Matemáticas | Física | Química | Computación | Económica | Metodología | Estadística |
|---|---|---|---|---|---|---|---|

| Rank Mundial | Institución* | País/Región | Puntuación Total | Puntuación en Alumni ▼ |
|---|---|---|---|---|
| 1 | Universidad de California-Berkeley | 🇺🇸 | 100 | 94.3 |
| 2 | Universidad de Harvard | 🇺🇸 | 96.5 | 100 |
| 3 | Universidad de Stanford | 🇺🇸 | 95.8 | 57.7 |
| 4 | Universidad del Noroeste | 🇺🇸 | 84.6 | 0 |
| 5 | Universidad de Cambridge | 🇬🇧 | 83.4 | 66.7 |
| 6 | Instituto de Tecnología de Massachusetts | 🇺🇸 | 82.9 | 0 |
| 7 | Instituto de Tecnología de California | 🇺🇸 | 80.8 | 0 |
| 8 | Instituto Federal Suizo de Tecnología de Zúrich | 🇨🇭 | 77 | 33.3 |
| 9 | Universidad de Kioto | 🇯🇵 | 76.9 | 33.3 |
| 10 | Universidad de California, Los Ángeles | 🇺🇸 | 72.9 | 0 |
| 11 | Universidad de Pennsylvania | 🇺🇸 | 72 | 57.7 |
| 12 | Universidad de Yale | 🇺🇸 | 70.3 | 57.7 |
| 13 | Universidad de California, Santa Bárbara | 🇺🇸 | 70.1 | 0 |
| 14 | Universidad de Oxford | 🇬🇧 | 67.7 | 33.3 |
| 15 | Universidad de Columbia | 🇺🇸 | 67.6 | 47.1 |
| 76-100 | Universidad de Zaragoza | 🇪🇸 | | 0 |

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# Shanghai University Ranking (2014)

| Matemáticas | Física | Química | Computación | Económica | Metodología | Estadística |
|---|---|---|---|---|---|---|

| Rank Mundial | Institución* | País/Región | Puntuación Total | Puntuación en Alumni ▼ |
|---|---|---|---|---|
| 1 | Universidad de Stanford | 🇺🇸 | 100 | 75.6 |
| 2 | Instituto de Tecnología de Massachusetts | 🇺🇸 | 96.8 | 37.8 |
| 3 | Universidad de California-Berkeley | 🇺🇸 | 88.7 | 100 |
| 4 | Universidad de Harvard | 🇺🇸 | 81.5 | 75.6 |
| 5 | Universidad de Princeton | 🇺🇸 | 77.7 | 37.8 |
| 6 | Universidad de Texas en Austin | 🇺🇸 | 73.1 | 37.8 |
| 7 | Universidad Carnegie Mellon | 🇺🇸 | 72.6 | 37.8 |
| 8 | Universidad de Cornell | 🇺🇸 | 70.1 | 37.8 |
| 9 | Universidad de California, Los Ángeles | 🇺🇸 | 69.3 | 37.8 |
| 10 | Universidad de Toronto | 🇨🇦 | 63.7 | 0 |
| 11 | Universidad de California, San Diego | 🇺🇸 | 63.4 | 0 |
| 11 | Universidad del Sur de California | 🇺🇸 | 63.4 | 0 |
| 13 | Instituto de Tecnología de California | 🇺🇸 | 62.8 | 37.8 |
| 14 | Universidad de Illinois en Urbana-Champaign | 🇺🇸 | 62.1 | 37.8 |
| 15 | Instituto Federal Suizo de Tecnología de Zúrich | 🇨🇭 | 61.8 | 0 |
| 151-200 | Universidad de Zaragoza | 🇪🇸 | | 0 |

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# Shanghai University Ranking (2014)

**Criterios, Indicadores y sus Valores del Ranking**

| Criterio | Indicador | Código | Valor |
|---|---|---|---|
| Calidad de la Docencia | Antiguos alumnos de una institución con premios Nobel y medallas Fields | Alumni | 10% |
| Calidad del Profesorado | Profesores de una institución que han obtenido premios Nobel y medallas Fields | Award | 20% |
| | Investigadores con alto índice de citación en diversas materias | HiCi | 20% |
| Producción Investigadora | Artículos publicados en Nature y Science | N&S* | 20% |
| | Artículos indexados en Science Citation Index - Expanded y Social Science Citation Index | PUB | 20% |
| Rendimiento per Cápita | Rendimiento académico per cápita de una institución | PCP | 10% |

* Para instituciones especializadas en Humanidades y Ciencias Sociales, no se considera el criterio N&S y el valor se redistribuye entre los demás indicadores de forma proporcional.

http://www.shanghairanking.com/es/index.html

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# 5. Useful tools

- ISI Web of Knowledge: http://www.accesowok.fecyt.es/
  - Access paid by Spanish Ministry of Science
  - Covers mainly papers and citations in JCR journals.
    - » Also includes some other journals and some conferences
  - Web of Science / Science Citation Index
    - » Find papers by author, journal, years,...
    - » Citations, h-index
  - Journal Citation reports
    - » Analyze journal Impact by title or category

# Useful tools

- Google Scholar:  http://scholar.google.es/
  - Free access
  - Covers journals, conferences and other web documents
  - Very useful to:
    » Find papers by author, publication, years,...
    » Find citations and h-index
    » Find papers containing certain words or phrases
      • In the title
      • Inside the paper
    » **Download the papers!!**

# Useful tools

- MS Academic:  http://academic.research.microsoft.com/
  - Free access
  - Competes with Google Scholar
  - Very useful to:
    - » Find papers by author, publication, years,...
    - » Find citations
    - » Find papers on a topic
    - » Filters by Topic, Institution,…

# Useful tools

- SCImago:  http://www.scimago.es/
    - Free access
    - Based on Scopus citations database (not free)
    - Covers journals and some good conferences
    - Useful to:
        » Compare journal impact using SJR (based on PageRank)
        » Compare scientific production by countries or regions
        » Institution rankings by scientific production

# How to find quality indicators

- For Journal papers:
  - Use ISI web: JCR & Science Citation Index
  - Relative ranking (Q1 or 13/512) is better that absolute IF=0.9
  - Add Google Scholar citations

- For conference papers
  - Search in conference rankings: CORE, SCIE
  - Find citations in ISI web, Google Scholar, MS Academic
  - For recent papers obtain citations/year

# Examples – Journals (data of Nov-2010)

- Ilarri S., Mena E., Illarramendi A.: Location-dependent query processing: Where we are and where we are heading, ACM Computing Surveys, 42(3):1-73, Mar 2010
  - JCR Journal, position 1/92 in Computer Science, Theory & Methods, IF = 7.667
  - 1 citation in Google Scholar (excluding self-citations)

- Civera J., Davison A.J., Magallón J.A. and Montiel J.M.M.: Drift-free real-time sequential mosaicing, Int. Journal of Computer Vision, 81(2): 128-137, Feb 2009
  - JCR Journal, position 4/103 in Computer Science, Artificial Intelligence, IF = 3.507
  - 8 citations in Google Scholar (excluding self-citations)

- Gutiérrez D., Serón F.J., López-Moreno J., Sánchez M.P., Fandos J., Reinhard E.: Depicting procedural caustics in single images, ACM Transactions on Graphics, 27(5), Dec 2008
  - JCR Journal, position 2/93 in Computer Science, Software Engineering, IF = 3.619,
  - 1 citation in ISI web (excluding self-citations)

- Ezpeleta J, Tricas F, Garcia-Valles F, Colom J.M. : A banker's solution for deadlock avoidance in FMS with flexible routing and multiresource states, IEEE Trans. on Robotics and Automation 18(4): 621-625, Aug 2002
  - JCR Journal, position 11/49 in Automation and Control Systems, IF = 1.048 (year 2002)
  - 39 citations in ISI web (average of 4.33 citations/year)

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# Examples - Conferences (data of Nov-2010)

- Civera, J., Grasa O.G., Davison A.J., Montiel JMM : 1-point RANSAC for EKF-based structure from motion, IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2009, pages 3498-3504.
    - 12 citations in Google Scholar (average of 6 citations/year)

- Laura A. Clemente, Andrew Davison, Ian Reid, José Neira, Juan D. Tardós, Mapping Large Loops with a Single Hand-Held Camera, Robotics Science and Systems, Atlanta, GA, USA , June 2007
    - Conference ranked A* in http://www.core.edu.au/
    - 102 citations in Google Scholar (average of 25.5 citations/year)

- Fabra, J; Alvarez, P; Banares, JA; Ezpeleta, J:: A framework for the development and execution of horizontal Protocols in open BPM systems, Proceeding of Business Process Management, 4102: 209-224, 2006
    - Conference ranked A in http://www.core.edu.au/
    - 12 citations in Google Scholar (average of 2.40 citations/year)

# Assignment #1

- Find the best journals and conferences in your area of interest
  - If you still don't have a defined research field, select the research line of your Department that you find more attractive.

- For Journals: find the IF and the SJR. For the best ones, try to find their orientation: surveys, incremental, ground-breaking, theoretical, applications, system papers?,...

- For Conferences: find their position in conference rankings, acceptance ratio, orientation, periodicity, the next deadline and the next location.

- Build a summary table and stick it close to your desk

# Assignment #2

- Try to find the most influential works and the "hot topics" in your area of interest

- What researchers and labs are more active and more relevant?

# Take-Home Messages

- Don't forget that reason #1 for publishing is contributing to the advance of knowledge

- Researcher evaluation is heavily based on publications and patents

- Current trends seem to be:
  - Value paper quality instead of quantity
  - Value patents and knowledge transfer

- Before publishing, think about patenting it

- Submit to the best conferences and journals you can

- Know you research field
  - Read many good papers
  - Learn how to use the available tools

# Next Talk (Tomorrow, same hour)

**Publish or Perish, Part II: How?**

1. The publishing process

2. How to write a paper?

3. How to write a review?

4. How to write a rebuttal?

5. Ethical Issues

   - Authorship, Plagiarism, Salami slicing, Conflicts of interest,...