

Master Robotics Graphics and Computer Vision
Doctorado Ingeniería de Sistemas e Informática
Universidad de Zaragoza

January 2025

Publish or Perish

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This presentation



My Background

Researcher on Robotics

- One book and +100 papers co-authored
- +200 papers reviewed for journals and conferences
- +80 papers handled as Associate Editor of IEEE Transactions on Robotics, IROS and RSS, obtaining reviews and recommending 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: Why, When, Where, How much?

1. Why Publish?
2. When to Publish?
3. Where to Publish?
 - Journal rankings: IF, Qx,....
 - Conference rankings: GSS, Core,...
4. How much?
 - Evaluation of researchers
 - Quantity, quality, impact,...
5. How to sell your CV?
 - Useful tools: WoS, Scopus, Google Scholar,...

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
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”: (excessive?) pressure to constantly publish
 - OK, but never forget reason #1
 - Beware of academic misconducts:
 - ♦ Salami slicing
 - ♦ Fake authorship
 - ♦ Paper mills, citation mills,...



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 **necessary** condition is submitting it
- Nobody will read it
 - Learn how to improve your chances (see this and next talk)

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

3. Where to Publish?

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

Where to Publish?

- National conferences?
 - Did you learn much from national conference papers?
 - They typically have very low impact
 - Much less expensive than an international conference
 - Useful to train young researchers
 - » Writing papers
 - » Presenting papers
 - Useful to meet your national colleagues
 - But **always** write in English

Where to Publish?

- Know your research field
- 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
- Know the orientation of each journal and conference:
 - Theoretical contributions / Applications and system papers?
 - Incremental advances / Ground-breaking novelties?
- My advice: submit to the best places you can
 - You will get better and more useful reviews
 - If rejected, listen to the reviewers, improve it, and try again
 - If you tried in a top place, retry in an easier one
 - » But don't point too high, try to be realistic



3.1 Journal Rankings: Impact Factor

- JCR: Journal Citation Reports
 - biblioteca.unizar.es → search: Journal Citation Reports
 - Systematic review of journal impact and influence
 - Measures yearly the number of citations to journal papers made in other journals and **a few** conferences
 - Used as reference by evaluation agencies in Spain: ANECA, ACPUA,...
- Impact Factor: **average** number of cites per year:
$$\frac{\text{cites in year } x \text{ to recent papers}}{\text{number of recent papers}}$$

recent = published from year $x-2$ to $x-1$ (impact factor)
or
published from year $x-5$ to $x-1$ (5-year impact factor)

JCR: Journal Citation Reports

ROBOTICS X JCR Year: 2023 X

Impact Factor: Avg Cites in 2023

Quartile And Rank

Journal name ▼	ISSN	eISSN	Category	Edition	2023 JIF ▼	JIF Quartile	JIF Rank
<input type="checkbox"/> Science Robotics	2470-9476	2470-9476	ROBOTICS	SCIE	26.1	Q1	1/46
<input type="checkbox"/> Annual Review of Control Robotics and Autonomous Systems	N/A	2573-5144	ROBOTICS	SCIE	11.2	Q1	2/46
<input type="checkbox"/> Cyborg and Bionic Systems	N/A	2692-7632	ROBOTICS	ESCI	10.5	Q1	3/46
<input type="checkbox"/> IEEE Transactions on Robotics	1552-3098	1941-0468	ROBOTICS	SCIE	9.4	Q1	4/46
<input type="checkbox"/> ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING	0736-5845	1879-2537	ROBOTICS	SCIE	9.1	Q1	5/46
<input type="checkbox"/> INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH	0278-3649	1741-3176	ROBOTICS	SCIE	7.5	Q1	6/46
<input type="checkbox"/> Advanced Intelligent Systems	N/A	2640-4567	ROBOTICS	SCIE	6.8	Q1	7/46
<input type="checkbox"/> Soft Robotics	2169-5172	2169-5180	ROBOTICS	SCIE	6.4	Q1	8/46
<input type="checkbox"/> IEEE ROBOTICS & AUTOMATION MAGAZINE	1070-9932	1558-223X	ROBOTICS	SCIE	6.1	Q1	9/46

?

Journal Impact Factor

- JIF varies a lot between subjects and years
 - » 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
- Q1..Q4 or T1..T3 are used as reference by most evaluation agencies in Spain: ANECA, ACPUA,...
 - For researcher accreditations and incentives
 - For institutional evaluations

Open Access

■ Gold Open Access

- Authors pay APCs: Article Publishing Charges
 - » Price varies with journal prestige: \$300 - \$1200 - \$5000

■ Hybrid Open Access

- Authors can pay for OA, otherwise, it's only for subscribers
 - » Ex: <https://open.ieee.org/publishing-options/hybrid-journals/>

■ Green Open Access

- Open access and free, ex: <https://openaccess.thecvf.com/menu>
- Others allow to post the **accepted** paper version on institutional or public repositories like arXiv
 - » The **final edited** version is usually not allowed (ex: IEEE)

■ Diamond/Platinum Open Access

- Paid by governments, universities, societies,...

Open Access

- Public funds => open access is **Mandatory**
 - US government 2013: 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
- Open Access journals are making **HUGE** profits
 - If not ranked in JCR, forget about them!
 - Most offer very fast reviews
 - Beware of **predatory journals**:
 - » No serious review process
 - » Just trying to get your money
 - Editorials under suspect: MDPI, Hindawi, Frontiers
 - » **Avoid** their special issues

Better use Green and Diamond Open Access



3.2 Conference Rankings

- Conference papers are ignored in Spain, unless you prove that the conference is really good
- Computer Science Conference Rankings:
 - CORE: <http://portal.core.edu.au/conf-ranks/>
 - » Ranks: A*, A, B, C
 - GSS/SCIE: <http://gii-grin-scie-rating.scie.es/>
 - » Ranks: (1) A++, A+, (2) A, A-, (3) B, B-
- If everything else fails, low acceptance rate ($\leq 30\%$) is an (unreliable) indicator of conference quality

4. How Much?

- In Spain, researchers are periodically evaluated:
 - “Acreditación” to get a permanent position
 - “Sexenios de investigación”: salary incentives every 6-years
- Publications always play an important role
- Evaluation agencies:
 - ANECA: Agencia Nacional de Evaluación de la Calidad y Acreditación
 - ACPUA: Agencia de Calidad y Prospectiva Universitaria de Aragón
 -

How to Evaluate Author's Publications?

■ Quantity

Not good

- Number of Publications
 - » There are 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 of the journals/conferences

Better

- Number of Publications in the best JCR Journals (Q1-Q2)
 - » But the JIF measures the **average impact** of a journal, not the true impact of a paper or a researcher.

■ Quality of the papers

Good

- Scientific relevance: Actual impact
 - » Difficult for young papers

San Francisco Declaration on Research Assessment (DORA):
<https://sfdora.org/read/>



How to Measure Author's 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 **$\geq h$ 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 WOS o Google Scholar (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 Get 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 3-6 months, and it’s gone
- Do good work
 - Write down your results, a good report will become a good paper
 - Submit papers to good conferences and journals
 - Do stays in good labs. Write joint papers (6 months)
 - Persevere
- Talk about your work
 - Present at good conferences. Discuss with people.
- Make public your software and datasets
 - First, understand GPL, AGPL, CC and BSD licenses

4.1 Sexenios de Investigación

- Salary incentive based on a 6-year research period
 - If you miss one, it's gone forever
 - Used as requirement in many places, like:
 - » 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.
- Based on your 5 best results:
 - Journal papers
 - Conference papers
 - Patents
 - Datasets, software,...

In 2023, ANECA adopted DORA:
evaluation moved from journal rankings
to paper quality and impact !

Sexenios: 5 Contributions

Dec 2024

Contribución al progreso del conocimiento en el área	10% Novelty, significance,...
Impacto científico Citations (normalized), JIF,...	60%
Impacto social On guides, policies, patents, media,...	10%
Contribución a la ciencia abierta OA, software, datasets	10%
Aportación preferente CS: JCR, CORE, patents, softw.	10% CS: Max. 3 Conf.
Posibles circunstancias reductoras de la calificación	
Reiteración de publicaciones Predatory Journals	Exclusión de aportaciones
Conflicto de interés editorial You are the editor	Exclusión de aportaciones
Malas prácticas de publicación Plagiarism, frauds,...	Exclusión de aportaciones
Procesos de revisión no contrastables Serious venue?	-25% a -100%
Autoría insuficientemente justificada Your contribution!	-15%

Evaluation based on the narrative provided by the candidate!

4.2 Accreditation for Professors (ANECA 2024)

LECTURER AND UNIVERSITY PROFESSOR (UP)		
	<i>Minimum</i>	<i>Maximum</i>
1. RESEARCH, KNOWLEDGE TRANSFER, AND KNOWLEDGE EXCHANGE ACTIVITIES	50 points	100 points
1.1. Research and knowledge transfer projects and contracts	0	30
1.1.1. Projects	0	30
1.1.2. Contracts	0	10
1.2. Results and dissemination of research, as well as knowledge transfer and exchange activities.	30	40
1.2.1. Research Activity #papers: 5 Ass. Prof / 15 Full Prof	30	40
1.2.2. Transfer and exchange of knowledge and professional activity.	0	20
1.2.3. Scientific dissemination	0	10
1.3. Exchanges at universities and research centres	0	30
1.4. Other merits*	0	10

* This optional section's points are added to those of the previous sections, but the maximum score of 100 points cannot be exceeded.

Same quality criteria than for Sexenios: Narrative!

Accreditation PEP (ANECA)

- Profesor Permanente Laboral
 - Still uses old CoD Accreditation
 - Not adapted to DORA
 - To be changed around Feb 2025

T1: JCR 1st tertile

T2: JCR 2nd tertile

T3: JCR 3rd tertile, SCIE 1, Core A A+

Under review

Technological Areas	Contratado Doctor
Research Experience	60
- Publications	32
- Books / chapters	3
- Projects / contracts	12
- Technology Transfer	6
- PhD advisory	4
- Conferences	2
- Other research activities	1
Teaching Experience	30
- University teaching	17
- Teaching evaluations	3
- Teaching courses	3
- Teach. projects, materials...	7
Academic and Professional	8
- PhD, scholarships, stays,...	6
- Professional experience	2
Other merits	2
Acceptance Threshold	Res+Teach: 50 Total: 55
Maximum in publications can be obtained with	6 x T1 8 x T2

5. How to Sell your CV?

- Keep in mind who will evaluate your CV
 - Experts in your specific research topic (SLAM) } Almost never
 - Experts in your field (Robotics/ Computer Vision) }
 - Experts in your area (Control / Computer Science) } Most probably
 - Experts in your macro-Area (Engineering) } Sometimes
- You need to explain:
 - Contribution to knowledge advancement
 - » Problem, relevance, novelty, novel methodology,...
 - What was your role in each publication
 - » *Contributor Roles Taxonomy*: <https://credit.niso.org>
 - Scientific and social impact
 - » Use, citations, venue quality, awards,...
 - » Put them in context: normalized impact,...



Example of (very brief) Narrative CV

DynaSLAM II: Tightly-Coupled Multi-Object Tracking and SLAM

Berta Bescós, Carlos Campos, Juan D. Tardós, José Neira

IEEE Robotics and Automation Letters vol. 6, no. 3, pp. 5191-5198, July 2021

- **Scientific Contribution:** SLAM (Simultaneous Localization and Mapping) is essential for autonomous operation of robots, vehicles and drones, and for AR/VR devices. The major limitation of current SLAM systems is that they assume static environments. In this paper we propose the first visual SLAM system able to track multiple objects.
- **Scientific Impact:** The paper has received 144 citations (without self-citations) in Google Scholar. According to Scopus its normalized impact FWCI is 9.58, being in the 99th percentile (top 1%) of its topic and year. According to WoS, IEEE-RAL appears in position 11/30 (Q2) in Robotics by Impact Factor.
- **Social Impact:** This work can contribute to safer and more intelligent autonomous transport systems, robots and AR/VR devices. It has been cited by patent CN115619824A in China that extends our method using visual-inertial sensors.
- **Open Science:** The paper preprint is available in ArXiv since October 2020.
- **Role:** I have been co-director of this work. My role was the conceptualization of the optimization method, the supervision of PhD student C. Campos, the analysis and evaluation of results, and the edition and revision of the article text.

Absolute impact

Normalized impact

Journal Quality



Example of (very brief) Narrative CV

ORB_SLAM-Atlas: A Robust and Accurate Multi-map System

Richard Elvira, Juan D. Tardós, José M.M. Montiel

IEEE/RSJ Int. Conf. on Intell. Robots and Systems (IROS), Macau, 2019, pp. 6253-6259,

- **Scientific Contribution:**
- **Scientific Impact:** The paper has received 70 citations (without self-citations) in Google Scholar. According to Scopus its normalized impact FWCI is 2.48, being in the 92th percentile (top 8%) of its field and year. IROS is one of the most prestigious conference in robotics. It appears as A+ (class 1) in the GSS Ranking 2021, backed by the Sociedad Científica de Informática de España (SCIE). Conference Quality
- **Social Impact:** The multi-map system proposed was integrated in the software library “ORB-SLAM stereo-inertial”, licensed by University of Zaragoza to one of the “big ten” technological companies in Asia, and is being used in the mobile devices of millions of users worldwide.
- **Open Science:** Available on ArXiv. The software was integrated in the open-source library ORB-SLAM3, available on GitHub under GPLv3 license, that is being used by hundreds of research institutions and companies (2.600 forks, 6.800 stars).

Role:



5.1 Useful Tools: WoS

- Web of Science:
 - biblioteca.unizar.es → search: Web of Science
 - 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: Scopus

- Scopus:
 - biblioteca.unizar.es → search: Scopus
 - For your papers, allows to find
 - » FWCI: Field-Weighted Citation Impact
 - Measures normalized impact
 - > 1 means more cited than the average
 - » Impact Percentile
 - 96% means being in the top 4% of category and year

Useful Tools: GS

- 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!!**

Number of citations: Google Scholar > Scopus > WoS

Specially in Computer Science and young papers

Take-Home Messages

- Reason for publishing
 1. Advancing knowledge
 2. Improving your CV (never #1!)
- Evaluation is heavily based on publications
- Current trends:
 - Recognize patents, software, datasets, knowledge transfer,...
 - Value quality (impact) more than quantity (#papers, #JCRs)
 - » See [Declaration on Research Assessment \(DORA\)](#)
- Submit to the best conferences and journals you can
 - Know your research field
 - » Read many good papers
 - » Learn how to use the available tools

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