















How to write great papers and get published

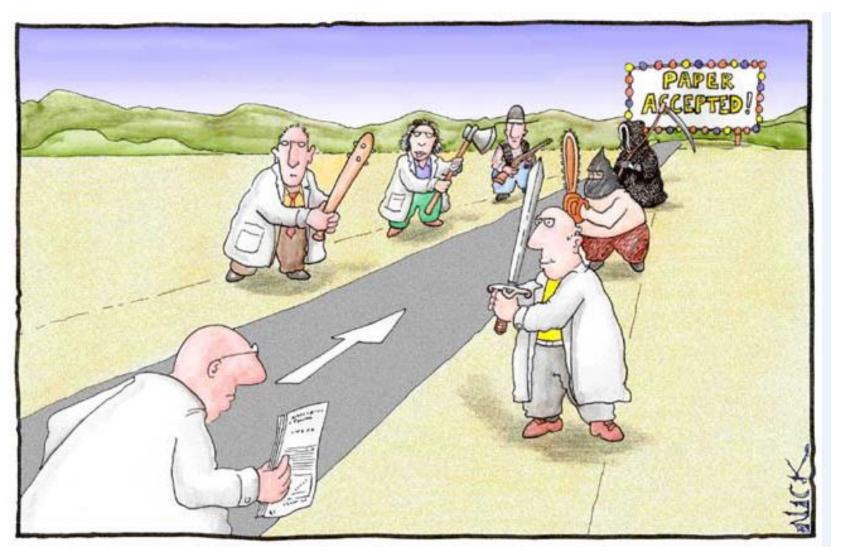
Understanding and benefiting from the publishing process





Presented by: Anthony Newman, Senior Publisher Location/Date: Stockholm, Sweden, August 2017

Why are you here?



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Workshop Outline

- How to get Published
 - Scholarly publishing overview
 - What to publish
 - Select your journal/readers/audience carefully
 - Articles types and options
 - Typical article structure
- Surviving Peer Review/Social Media/OA/Ethics
 - The review and editorial process and your response
 - Promoting your research using social media
 - Open Access or Not?
 - Publishing ethics
- Questions and Answers



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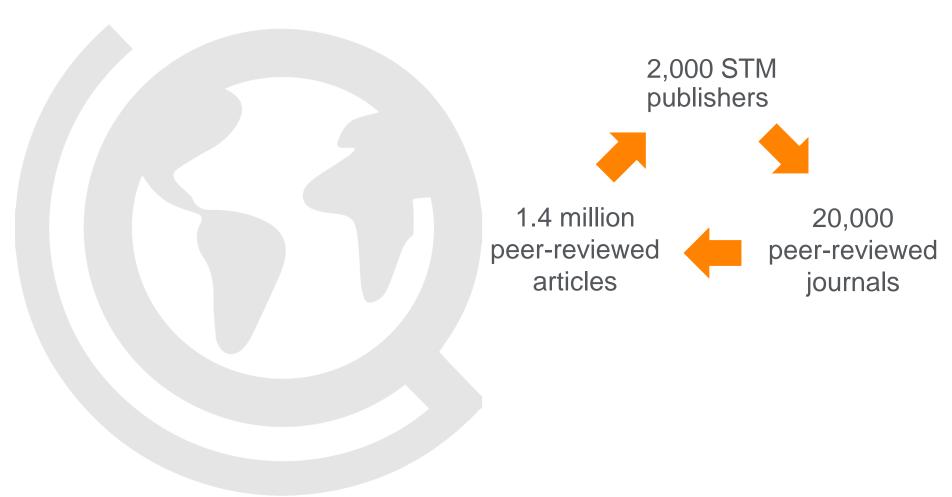
Scholarly Publishing Overview

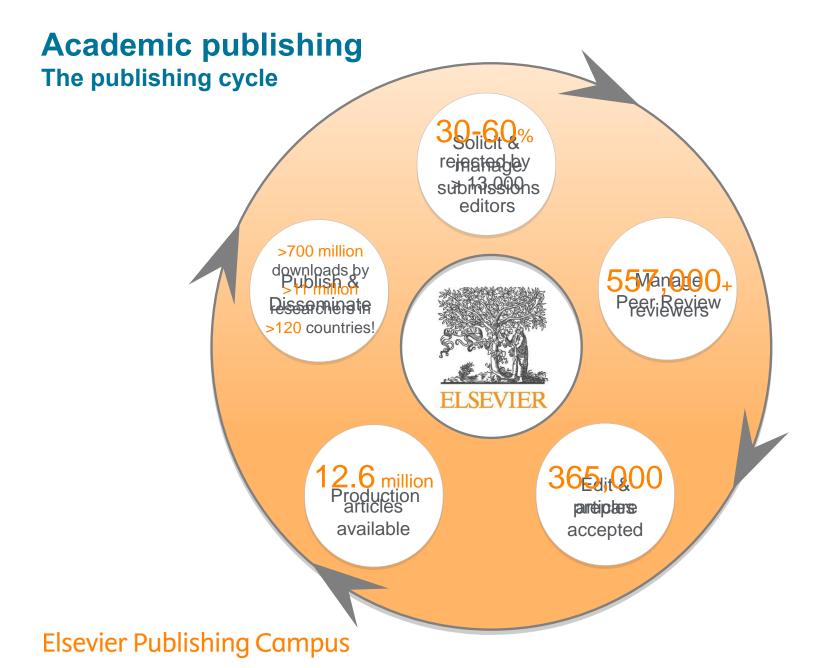
Peer-reviewed journal growth 1990-2013



Scholarly publishing today

Scientific, technical and medical (STM) publishing





Trends in publishing

Rapid conversion from "print" to "electronic"

• 1997: print only

2009: 55% e-only (mostly e-collections)

25% print only

20% print-plus-electronic

2014: 95+% e-only (in life sciences field over 99%)

• 2018: ???

- Changing role of "journals" due to e-access
- Increased usage of articles (more downloads), but less in-depth use
 - at lower cost per article
- Electronic submission
 - Increased manuscript inflow
- Experimentation with new publishing models
 - E.g. "author pays" models, "delayed open access", etc.
- Experimentation with new publication types and innovations
 - More exposure, more data reuse, more flexibility



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Why to publish and What to publish

Your personal reason for publishing



However, editors, reviewers, and the research community don't consider these reasons when assessing your work – the content counts!

Why publish?

Publishing is one of the necessary steps embedded in the scientific research process. It is also necessary for graduation and career progression.

What to publish:

- √ New and original results or methods
- ✓ Reviews or summaries of particular subject
- ✓ Manuscripts that advance the knowledge and understanding in a certain scientific field

What NOT to publish:

- Reports of no scientific interest
- Out of date work
- **Duplications** of previously published work
- Incorrect/unacceptable conclusions

You need a STRONG, EFFECTIVE manuscript to present your contributions to the scientific community.

A good manuscript has

- good CONTENT
 - √ useful and exciting

and has

- a good PRESENTATION of the data
 - √ clear and logically constructed

What is a strong manuscript?

- √ Has a <u>novel</u>, <u>clear</u>, <u>useful</u>, and <u>exciting</u> message
- ✓ Presented and constructed in a <u>logical</u> manner
- √ Reviewers and editors can grasp the scientific significance easily

Editors and reviewers are all busy scientists.

Make things easy to save their time.



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How to get your article published Before you start writing

Refine your searching – be strategic!

Too many researchers have abandoned all the value of libraries when they stopped going there physically!



Learn what online resources are available at your institute, and learn to search in a clever way.

Ask your library experts for help.

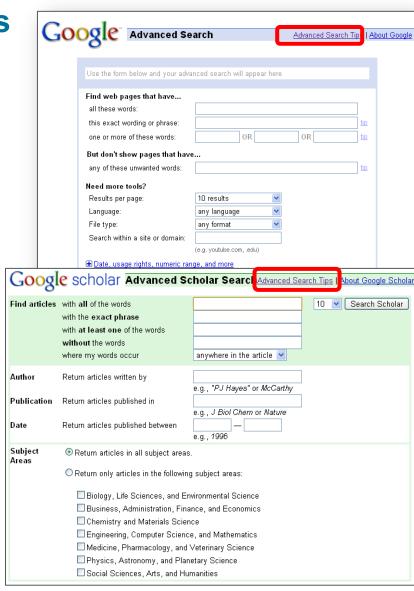
Haglund and Olson, 2008:

"... researchers have difficulties in identifying correct search terms. Searches are often unsuccessful."

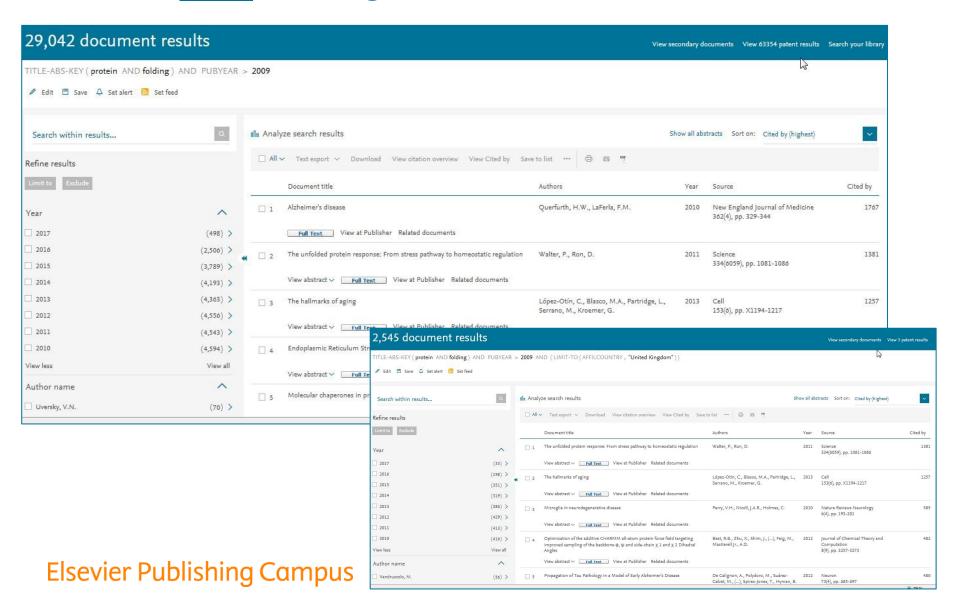
Use the advanced search options

- Within Google and Google Scholar use the advanced searches and check out the Search Tips.
- In ScienceDirect, Scopus, WoS, PubMed and other databases use proximity operators:
 - W/n ← Within (non order specific)
 - pre/n — Precedes (order specific)

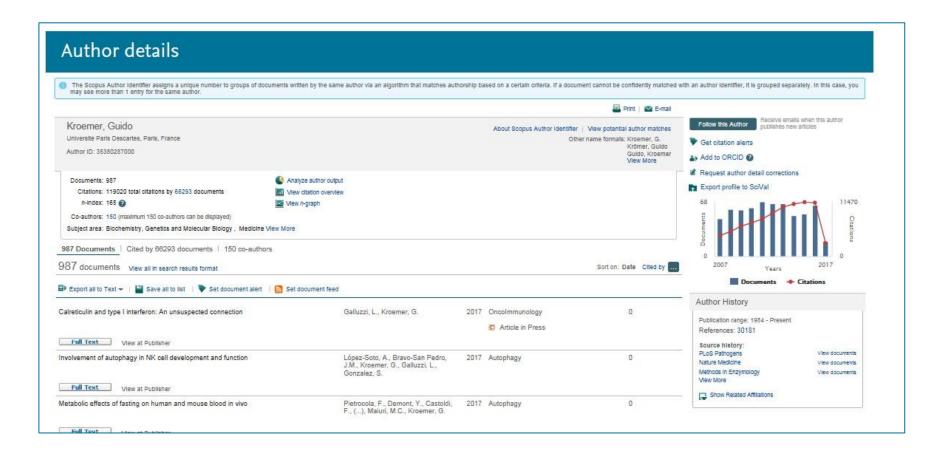
E.g. wind w/3 energy



Find out what is being cited and from where



Find out who is being cited



Strategic Information gathering

- Make sure your idea/concept is original at the beginning of your research, not at the time of writing! (Checklist!)
- There are many tools available such as SCOPUS, WoS, Google Scholar, PubMed.
- Use what you have available. Become skilled in using these effectively.....
- Referees of papers in Elsevier journals get 1 month personal free access to Scopus.

Questions to answer before you write

Think about WHY you want to publish your work.

- ✓ Is it new and interesting?
- ✓ Is it a current hot topic?
- ✓ Have you provided solutions to some difficult problems?
- ✓ Are you ready to publish at this point?

If <u>all</u> answers are "<u>yes</u>", then start preparations for your manuscript

What type of manuscript?

- Full articles/Original articles;
- Letters/Rapid Communications/Short communications/Case reports;
- Review papers/perspectives
- New manuscript types: e.g. MicroArticles, MethodsX, Software, Graphical Reviews......

Self-evaluate your work: Is it sufficient for a full article? Or are your results so thrilling that they need to be shown as soon as possible?

Do you want to experiment with the new articles types?

Ask your supervisor and colleagues for advice on manuscript type. Sometimes outsiders see things more clearly than you.



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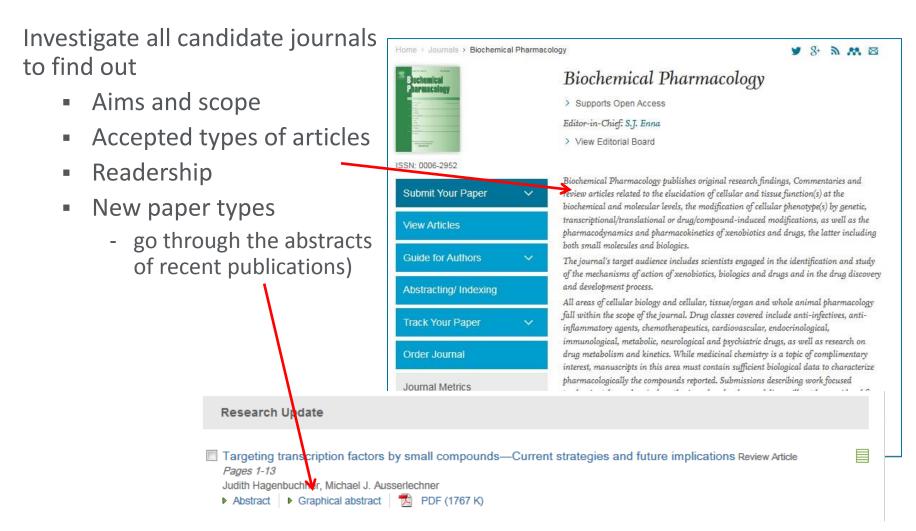
Identifying the right journal

And writing for it

Select the best journal for submission

- Look at your references these should help you narrow your choices.
- Review recent publications in each "candidate journal". Find out the hot topics, the accepted types of articles, etc.
- Ask yourself the following questions:
 - ✓ Is the journal peer-reviewed to the right level?
 - ✓ Who is this journal's audience?
 - √ How fast does it make a <u>decision</u> or <u>publish</u> your paper?
 - ✓ What are the various **Impact metrics** for the journal?
 - ✓ Do you want/need to publish Open Access?
 - ✓ Does it really exist or is dubious? (check for example <u>archived version</u> of Beall's List of Predatory Open Access Publishers)

Choose the right journal



Bibliometric indicators



What is the Impact Factor (IF)?

Impact Factor

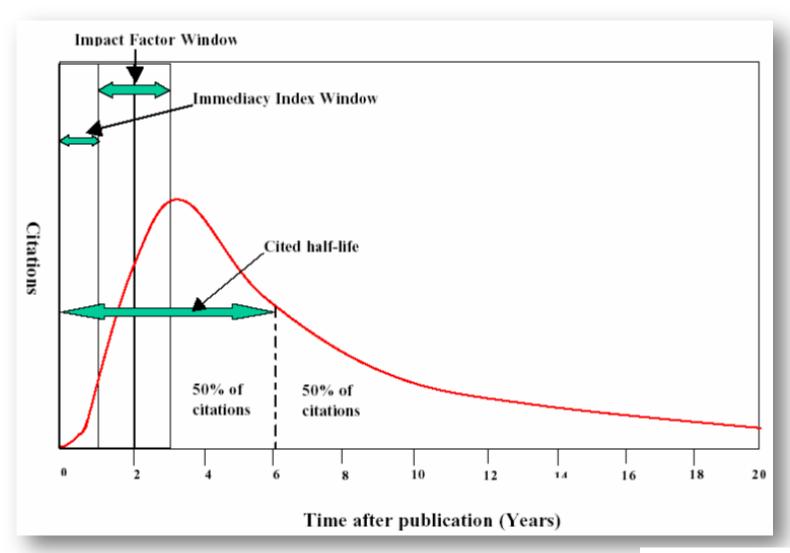
[the average annual number of citations per article published]

For example, the 2014 impact factor for a journal is calculated as follows:

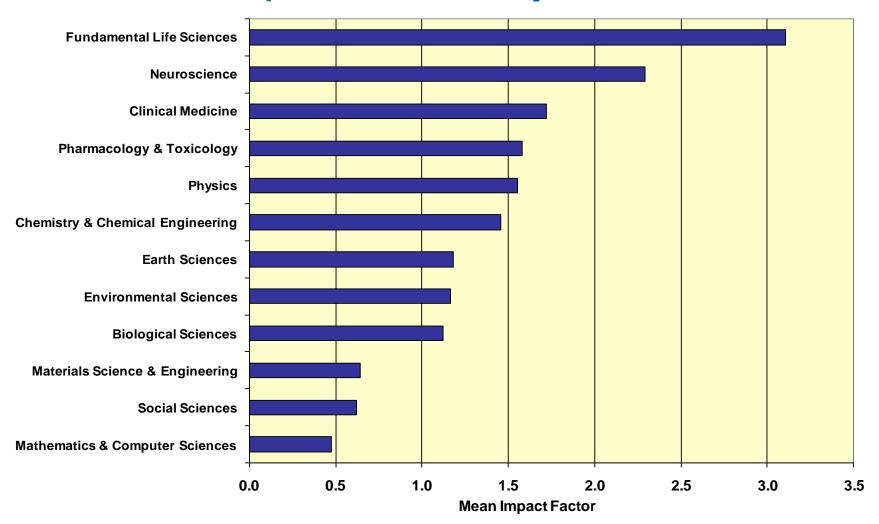
- A = the number of times articles published in 2012 and 2013 were cited in indexed journals during 2014
- *B* = the number of "citable items" (usually articles, reviews, proceedings or notes; not editorials and letters-to-the-Editor) published in 2012 and 2013
- 2014 impact factor = A/B
- e.g. <u>600 citations</u> = 2.000 150 + 150 articles

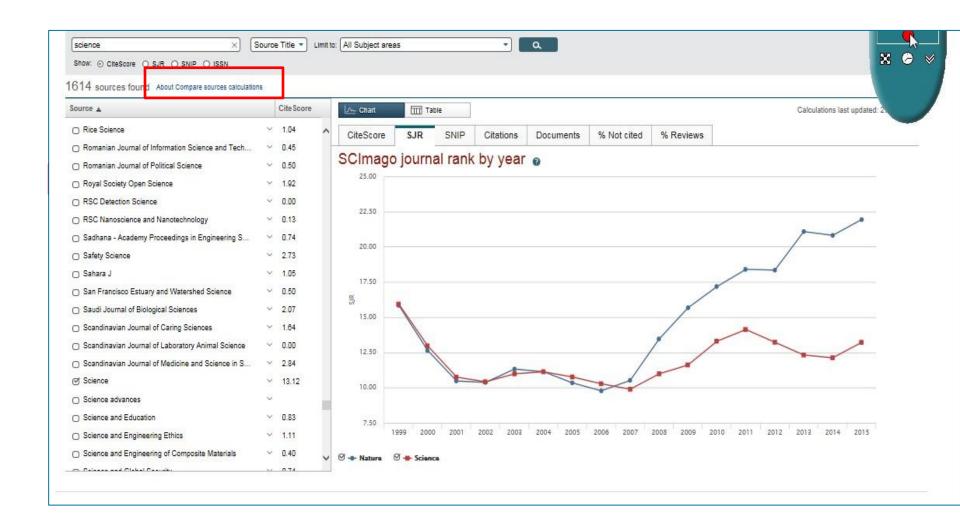


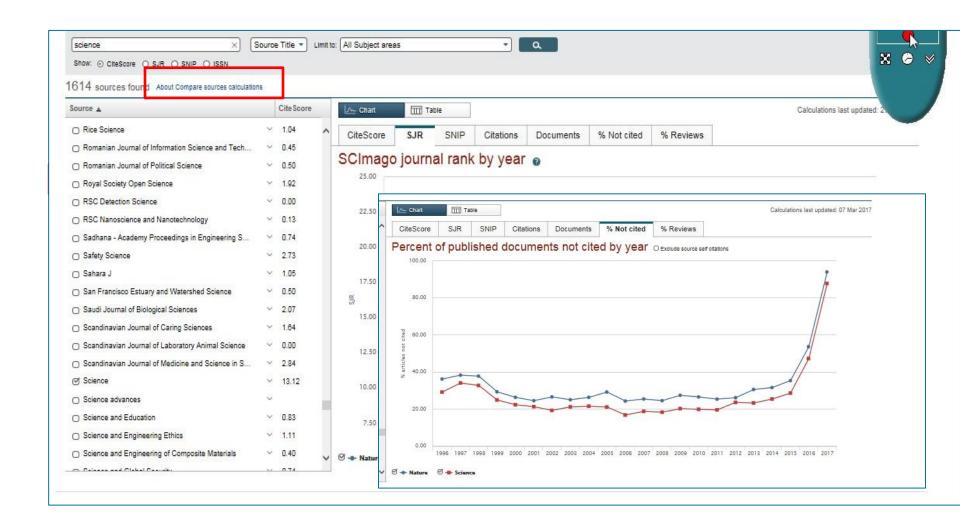
Impact Factor and other bibliometric parameters



Influences on Impact Factors: Subject Area







Identify the right audience for your paper

- ✓ Identify the sector of readership/community for which a paper is meant
- √ Identify the interest of your audience
- ✓ Get advice from your university library team on where to publish.
- ✓ Ask your supervisor or colleagues for recommendations



Your Journals list for this manuscript

So you now have a list of candidate journals for your manuscript.....

- ✓ All authors of the submission agree to this list and the sequence of journals.
- ✓ Write your draft as if you are going to submit to the first journal on your list.
 Use its Guide for Authors these differ per journal

> DO NOT gamble by submitting your manuscript to more than one journal at a time.

International ethics standards prohibit multiple/simultaneous submissions, and editors DO find out! (Trust us, they DO!)

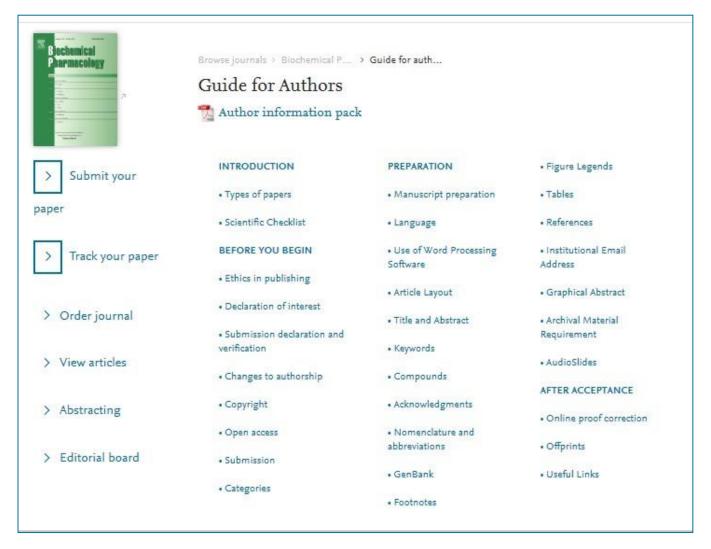
Read the 'Guide to Authors'- Again and again!

Stick to the Guide for
 Authors in your manuscript,
 even in the first draft (text layout, nomenclature, figures & tables, references etc.).
 In the end it will save you time, and also the editor's.

 Editors (and reviewers) do not like wasting time on poorly prepared manuscripts.
 It is a sign of disrespect.



Read the 'Guide to Authors'- Again and again!



Common problems with submissions:

An international editor says...

"The following problems appear much too frequently"

- Submission of papers which are clearly out of scope
- Failure to format the paper according to the Guide for Authors
- Inappropriate (or no) suggested reviewers
- Inadequate response to reviewers
- Inadequate standard of English
- Resubmission of rejected manuscripts without revision
 - Paul Haddad, Editor, Journal of Chromatography A

Why is language important?

Save your editor and reviewers the trouble of guessing what you mean

Complaint from an editor:

"[This] paper fell well below my threshold. I refuse to spend time trying to understand what the author is trying to say. Besides, I really want to send a message that they can't submit garbage to us and expect us to fix it.

My rule of thumb is that if there are *more than 6 grammatical errors* in the abstract, then <u>I don't waste my time</u> carefully reading the rest."

Scientific Language – Overview

Write with clarity, objectivity, accuracy, and brevity.

Key to successful scientific writing is to be alert for common errors:

- ★Sentence construction
- ★Incorrect tenses
- ★Inaccurate grammar
- **★**Not using English

Check the <u>Guide for Authors</u> of the target journal for language specifications

Scientific Language – Sentences

- ✓ Write direct and <u>short</u> sentences more professional looking.
- ✓ One idea or piece of information per sentence is sufficient.
- Avoid multiple statements in one sentence they are confusing to the reader.



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Authorship

Authorship: Who is allowed to be an Author?

- Policies regarding authorship can vary
- Most common example: the International Committee of Medical Journal Editors ("Vancouver Group") declared that an author must:
 - 1. **substantially contribute** to conception and design, or acquisition of data, or analysis and interpretation of data;
 - draft the article or revise it critically for important intellectual content; and
 - 3. give their approval of the final full version to be published.
 - 4. agreement to be accountable for all aspects of the work in ensuring that questions related to accuracy or integrity of any part of the work are appropriately investigated and resolved.

ALL four conditions must be fulfilled to be an author!

All others would qualify as "Acknowledged Individuals"

Authorship - Sequence & Abuses

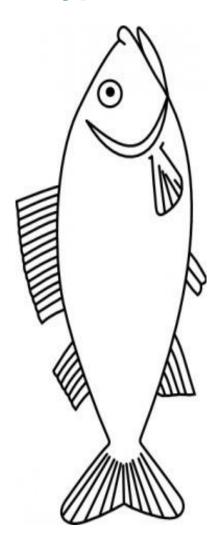
- General principles for who is listed first:
 - First Author
 - Conducts and/or supervises the data generation and analysis and the proper presentation and interpretation of the results
 - Puts paper together and submits the paper to journal
 - Corresponding or Senior author
 - The first author or a senior author from the institution.
 - Particularly when the first author is a PhD student or postdoc, and may move to another institution soon.
- Abuses to be avoided:
 - Ghost Authorship: leaving out authors who should be included
 - Gift Authorship: including authors who did not contribute significantly



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Typical article structure

Typical Structure of a Research Article



- Title
- Abstract
- Keywords
- Main text (IMRAD)
 - Introduction
 - Methods
 - Results
 - And
 - Discussions
- Conclusion
- Acknowledgement
- References
- Supplementary Data
 - Reviews, MicroArticles etc different layout.
 - Social sciences more discussion and less data.

Make them easy for indexing and searching! (informative, attractive, effective)

Journal space is not unlimited.

Your reader's time is scarce.

Make your article as concise as possible - more difficult than you imagine!

The process of writing – building the article

Title & Abstract

Conclusion Introduction

Methods Results Discussion

Figures/tables (your data)

Title

A good title should contain the fewest possible words that adequately describe the contents of a paper.

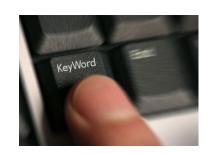
Effective titles

- ✓ Identify the main issue of the paper
- ✓ Begin with the subject of the paper
- ✓ Are accurate, unambiguous, specific, and complete
- ✓ Are as **short** as possible
 - ✓ Articles with short, catchy titles are often better cited
- Less Do not contain rarely-used abbreviations
- ✓ Attract readers Remember: readers are the potential authors who will cite your article

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Keywords

In an "electronic world", keywords determine whether your article is found or not!



Avoid making them

- too general ("drug delivery", "mouse", "disease", etc.)
- too narrow (so that nobody will ever search for it)

Effective approach:

Look at the keywords of articles relevant to your manuscript Play with these keywords, and see whether they return relevant papers, neither too many nor too few – a good guideline.

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Abstract

Tell readers what you did and the important findings

- One paragraph (between 50-250 words) often, plus Highlight bullet points
- Advertisement for your article, and should encourage reading the entire paper
- A clear abstract will strongly influence if your work is considered further

Graphite intercalation compounds (GICs) of composition $CxN(SO_2CF_3)_2 \cdot \delta F$ are prepared under ambient conditions in 48% hydrofluoric acid, using K2MnF6 as an oxidizing reagent. The stage 2 GIC product structures are determined using powder XRD and modeled by fitting one dimensional electron density profiles.

What has been done

A new digestion method followed by selective fluoride electrode elemental analyses allows the determination of free fluoride within products, and the compositional x and δ parameters are determined for reaction times from 0.25 to 500 h.

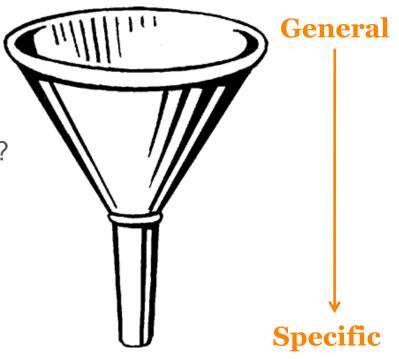
What are the main findings

Introduction

The place to convince readers that you know why your work is relevant, <u>also for them</u>.

Answer a series of questions:

- What is the problem?
- Are there any existing solutions?
- Which one is the best?
- What is its main limitation?
- What do you hope to achieve?



Pay attention to the following

- ✓ Before you present your new data, put them into perspective first
- ✓ Be brief, it is <u>not</u> a history lesson
- Do not mix introduction, results, discussion and conclusions. Keep them separate
- Less Do not overuse expressions such as "novel", "first time", "first ever", "paradigm shift", etc.
- √ Cite only <u>relevant</u> references
 - Otherwise the editor and the reviewer may think you don't have a clue what you are writing about!

Methods / Experimental

- ✓ Include all important details so that the reader can repeat the work.
 - Details that were previously published can be omitted but a general summary of those experiments should be included
- √ Give vendor names (and addresses) of equipment etc. used
- ✓ All chemicals must be identified.
 - Do not use proprietary, unidentifiable compounds without description. State purity and/or supplier if it is important.
- ✓ Present proper control experiments
- Avoid adding comments and discussion
- ✓ Write in the past tense
 - Most journals prefer the passive voice, some the active.
- √ Consider use of Supplementary Materials
 - Documents, spreadsheets, audio, video, ...

Reviewers will criticise incomplete or incorrect method descriptions, and may even recommend rejection

Results – what have you found?

The following should be included

- √ the main findings
 - Thus not all findings. Decide what to share.
 - Findings from experiments described in the Methods section
- ✓ Highlight findings that differ from findings in previous publications, and unexpected findings
- ✓ Results of the statistical analysis



Results – Figures and tables

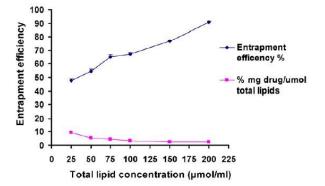
Illustrations are critical, because:

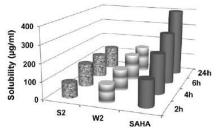
- Figures and tables are the most efficient way to present results
- Results are the driving force of the publication
- Captions and legends must be detailed enough to make figures and tables self-explanatory
- Figures and tables should not need further explanation or description in text. Less writing and less reading.
 Let your figures do the work instead of words.

"One Picture is Worth a Thousand Words" Sue Hanauer (1968)

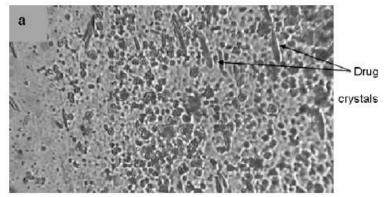
Results – appearance counts!

- √ Un-crowded plots
 - √ 3 or 4 data sets per figure; well-selected scales; appropriate
 axis label size; symbols clear to read; data sets easily distinguishable.
- ✓ Each photograph must have a scale marker of professional quality in a corner.
- √ Text in photos / figures in English
 - 🖊 Not in French, German, Chinese, Korean, ...
- ✓ Use colour ONLY when necessary.
 - If different line styles can clarify the meaning, then do not use colours or other thrilling effects.
- ✓ If used, colour must be visible/distinguishable when printed in black & white.
- Do not include long boring tables!









Discussion – what do your results mean?

 It is the most important section of your article. Here you get the chance to SELL your data! Many manuscripts are <u>rejected</u> because the Discussion is weak.

Check for the following:

- ✓ Do your results relate to the original question or objectives outlined in the Introduction section?
- ✓ Do you provide interpretation for each of your results presented?
- ✓ Are your results consistent with what other investigators have reported? Or are there any differences? Why?
- ✓ Are there any limitations?
- ✓ Does the discussion logically lead to your conclusion?

Do not:

- Make statements that go beyond what the results can support
- Suddenly introduce new terms or ideas

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Conclusions

- ✓ Present global and specific conclusions
- ✓ Indicate uses and extensions if appropriate
- ✓ Suggest future experiments and indicate whether they are underway
- Do not summarise the paper
 - The abstract is for that purpose
- Avoid judgments about impact
 - Others can comment, you should not.

References: get them right!

- √ Please adhere to the Guide for Authors of the journal
- ✓ It is your responsibility, not of the Editor's, to format references correctly!
- ✓ Get help, save time use Reference management software
- √ Check
 - Referencing style of the journal
 - The spelling of author names, the year of publication
 - Punctuation use
- Avoid citing the following if possible:
 - Personal communications, unpublished observations, manuscripts not yet accepted for publication
 - Articles published only in the local language, which are difficult for international readers to find

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Reference Management Software helps

- Many journals are helpful in formatting the journal reference style for you (e.g. Elsevier's Your Paper Your Way service).
- If the publisher is not offering this service it is <u>your</u> responsibility to format references correctly!











en.wikipedia.org/wiki/Comparison_of_reference_management_software

Supplementary Material

- Data of secondary importance for the main scientific thrust of the article
 - e.g. individual curves, when a representative curve or a mean curve is given in the article itself
- Or data that do not fit into the main body of the article
 - e.g. audio, video,
- Original figure before color correction or trimming for clarity
- Not part of the printed article
 - Will be available online with the published paper
- Must relate to, and support, the article

Cover Lett

Professor H. D. Schmidt School of Science and Engineering Northeast State University College Park, MI 10000 USA

January 1, 2008

Final approval from all authors

burnal

Dear Professor Schmidt,

Submitted

Mention v

Note specent

Enclosed with this letter you will find en electronic submission of a manus entitled "Mechano-sorptive creep under compressive loading – a microms model" by John Smith and myself. This is an original paper which reither previously nor simultaneously in whole or in part been submitted where else. Both authors have read and approved the final version submitted.

Mechano-sorptive is sometimes denoted as accelerated creep. It has been experimentally observed that the creep of paper accelerates if it is subjected to a cyclic moisture content. This is of large practical importance for the paper industry. The present manuscript describes a micromechanical model on the fibre network level that is able to capture the experimentally observed behaviour. In particular, the difference between mechano-sorptive creep in tension and compression is analysed John Smith is a PhD-student who within a year will present his doctoral thesis. The present paper will be a part of that thesis.

Three potential independent reviewers who have excellent expertise in the this paper are:

Explanation of importance of research

interest)

Dr. Fernandez, Tennessee Tech, email1@university.com

Dr. Chen, University of Maine, email2@university.com

Dr. Singh, Colorado School of Mines, email3@university.com

I would very much appreciate if you would consider the manuscript for publication in the International Journal of Science.

Suggested reviewers

ely yours,

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A. Professor

Suggest potential reviewers

- Your suggestions will help the Editor to move your manuscript to the review stage more efficiently.
- You can easily find potential reviewers and their contact details from articles in your specific subject area (e.g., your references).
- The reviewers should represent at least two regions of the world. And they should not be your supervisor or close friends.
- Be prepared to suggest 3-6 potential reviewers, based on the Guide to Authors.



Do everything to make your submission a success

- No one gets it right the first time!
 - ✓ Write, and re-write
- Suggestions
 - ✓ After writing a first version, take several days of rest. Come back with a critical, fresh view.
 - ✓ Ask colleagues and supervisor to review your manuscript. Ask them to be highly critical, and be open to their suggestions.
 - ✓ Make changes to incorporate comments and suggestions.
 Get all <u>co-authors to approve</u> version to submit.

Then it is the point in time to submit your article!

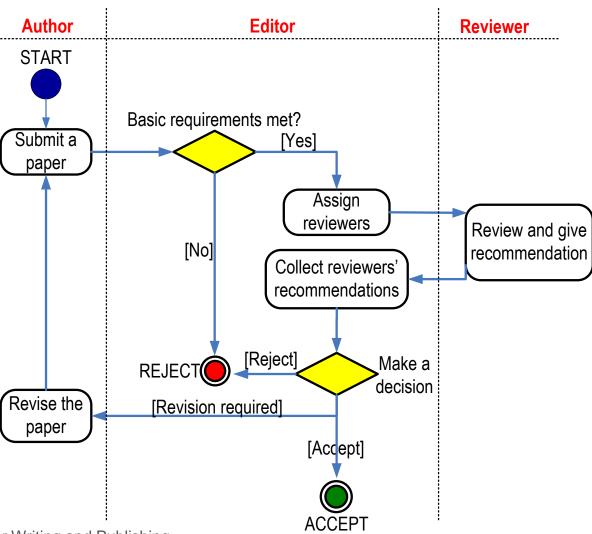


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The peer review process

The Peer Review Process is not a black hole!



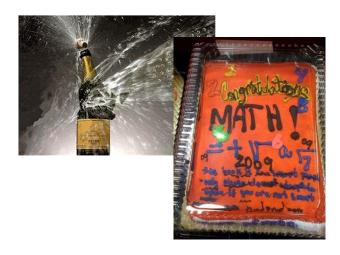


Michael Derntl. Basics of Research Paper Writing and Publishing. http://dbis.rwth-aachen.de/~derntl/papers/misc/paperwriting.pdf

First Decision: "Accepted" or "Rejected"

Accepted

Very rare, but it happens



- Congratulations!
 - Cake for the department
 - Now wait for page proofs and then for your article to be online and in print

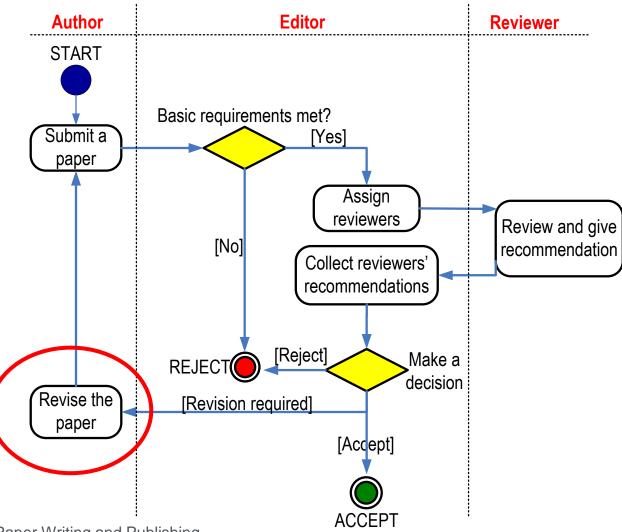
Rejected

- Probability 40-90% ...
- Do not despair
 - It happens to everybody
- Try to understand WHY
 - Consider reviewers' advice
 - Be self-critical
- If you submit to another journal, begin as if it were a new manuscript
 - Take advantage of the reviewers' comments and revise accordingly
 - They may review your manuscript for the next journal too!
 - Read the Guide for Authors of the new journal, again and again.



The Peer Review Process – revisions





Michael Derntl. Basics of Research Paper Writing and Publishing. http://dbis.rwth-aachen.de/~derntl/papers/misc/paperwriting.pdf

First Decision: "Major" or "Minor" Revision

Major revision

- The manuscript may finally be published in the journal
- Significant deficiencies must be corrected before acceptance
- Usually involves (significant) textual modifications and/or additional experiments

Minor revision

- Basically, the manuscript is worth being published
- Some elements in the manuscript must be clarified, restructured, shortened (often) or expanded (rarely)
- Textual adaptations
- "Minor revision" does NOT guarantee acceptance after revision, but often it is accepted if all points are addressed!

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Manuscript Revision

- Prepare a detailed Response Letter
 - √ Copy-paste <u>each</u> reviewer comment, and type your response below it.
 - ✓ State specifically which changes you have made to the manuscript
 - √ Include page/line numbers
 - No general statements like "Comment accepted, and Discussion changed accordingly."
 - ✓ Provide a *scientific* response to comments to accept,
 - ✓ or a convincing, solid and <u>polite</u> rebuttal when you feel the reviewer was wrong.
 - ✓ Write in such a manner, that your response can be forwarded to the reviewer without prior editing
- Do not do yourself a disfavour, but cherish your work
 - You spent weeks and months in the lab or the library to do the research

.....Why then run the risk of avoidable rejection by not taking manuscript revision seriously?

Increasing the likelihood of acceptance

All these various steps are not difficult.

- ✓ You have to be consistent.
- √ You have to check and recheck before submitting.
- ✓ Make sure you tell a logical, clear, story about your findings.
- ✓ Especially, take note of referees' comments. They improve your paper.

This should increase the likelihood of your paper being accepted, and being in the 30% (accepted) not the 70% (rejected) group!

What leads to acceptance?

- ✓ Attention to details
- ✓ Check and double check your work
- ✓ Consider the reviewers' comments
- ✓ English must be as good as possible.
- ✓ Presentation is important
- ✓ Take your time with revision
- ✓ Acknowledge those who have helped you
- √ New, original and previously unpublished
- ✓ Critically evaluate your own manuscript
- √ Ethical rules must be obeyed

Nigel John Cook
 Editor-in-Chief, Ore Geology Reviews



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Promoting your article

Your Paper is Published – What now?

- Your paper becomes visible online in the journal website, such as ScienceDirect, Springer Link etc. and in databases as SCOPUS, PubMed, etc.
- There are many things you can do to draw attention to your great research just online...
- Think Social Media! Check out the Publishing Campus for suggestions.

More information

www.elsevier.com/promote-your-work



Animation video (YouTube) https://www.youtube.com/watch?v=zRXnbKtHkHM

www.publishingcampus.com: College of Networking / Getting Noticed



Get Noticed



Brochure

Factsheet



Online lectures and interactive courses



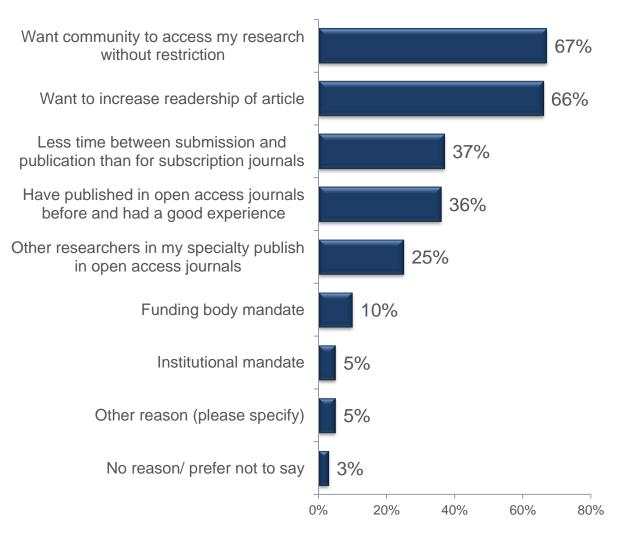
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Open access publishing

What is the difference?

	Gold Open Access	Green Open Access
Access	Free public access to the final published articleAccess is immediate and permanent	 Free public access to a version of your article Time delay may apply (embargo period)
Fee	 Open access fee is paid by the author, or on their behalf (for example by a funding body) 	 No fee is payable by the author, as costs are covered by library subscriptions
Use	 Determined by your user licence 	 Authors retain the right to use their articles for a wide range of purposes Open versions of your article should have a user license attached
Options	 Publish in an open access journal access (also known as a hybrid journal) 	Link to your article.Selected journals feature open archivesSelf-archive a version of your article

Why publish in an open access journal?



14%

have been asked by their departmental head or funding organization to publish open access

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Tips for publishing gold open access

Find the right journal: Look for reputable journals

Collect key info: Check your funding body and institution's policies

Make your article OA: Select a license and pay an OA fee

Publish OA: Share the final version of your article!

Much more information may be found online at Elsevier Publishing Campus



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Publication Ethics

Author Responsibilities

As authors we have lots of rights and privileges, but also we have the responsibility to be ethical.

Ethics Issues in Publishing

Scientific misconduct

Falsification of results or images

Publication misconduct

- Plagiarism
 - Different forms / severities
 - The paper must be original to the authors
- Duplicate publication
- Duplicate submission
- Appropriate acknowledgement of prior research and researchers
- Appropriate identification of all co-authors
- Conflict of interest

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Plagiarism

- A short-cut to long-term consequences!
- Plagiarism is considered a <u>serious</u>
 offense by your institute, by journal
 editors, and by the scientific community
 as a whole.



- Plagiarism may result in <u>academic charges</u>, but will certainly cause rejection of your paper.
- Plagiarism will <u>hurt your reputation</u> in the scientific community.

Duplicate Publication

- Duplicate Publication is also called Redundant Publication, or Self Plagiarism
- Definition: Two or more papers, without full cross reference, share the same hypotheses, data, discussion points, or conclusions
- An author should not submit for consideration to another journal a previously published paper.
 - ✓ Published studies do not need to be repeated unless further confirmation is required.
 - ✓ Previous publication of an abstract during the proceedings of conferences does not preclude subsequent submission for publication, but <u>full disclosure</u> should be made at the time of submission.
 - ✓ Re-publication of a paper in another language is acceptable, provided that there is <u>full</u> and <u>prominent disclosure of its original source</u> at the time of submission.
 - ✓ At the time of submission, authors should disclose details of related papers, even if in a different language, and similar papers in press.
 - ✓ This includes translations.

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- TurnItIn (aimed at universities)
- iThenticate (aimed at publishers and corporations)



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More traditional approach also happens:

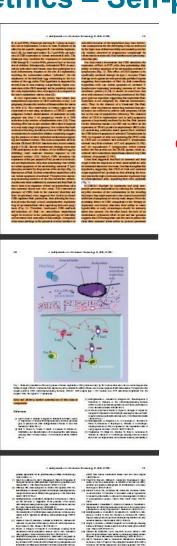
- Editors and reviewers
- Your colleagues
- Readers
- "Other" whistleblowers
 - "The walls have ears", it seems ...



Publication ethics – Self-plagiarism

2003

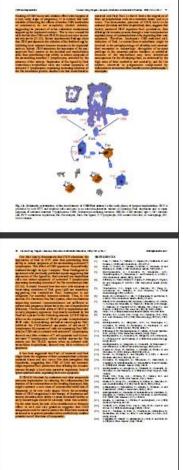




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2004





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RETRACTED: Matching pursuit-based approach t

Available online 24 August 2005.

This article has been retracted at the request of the Editor-in-Chief and P http://www.elsevier.com/locate/withdrawalpolicy.

Reason: This article is virtually identical to the previously published article algorithm for SNR improvement in ultrasonic NDT", *Independent Nonde International*, volume 38 (2005) 453 – 458 authored by N. Tolia Tol

the echoes issuing from the flaws to be detected. Therefore, it cannot be cancelled by classical time averaging or matched band-pass filtering techniques.

Many signal processing techniques have been utilized for sigmal-to-noise ratio (SNR) improvement in ultrasonic NDT of highly scattering materials. The most popular one is the split spectrum processing (SSP) [1-3], because it makes possible real-time ultrasonic test for industrial applications, providing quite good results. Alternatively to SSP, wavelet transform (WT) based denoising/detection methods have been proposed during recent years [4-8], yielding usually to higher improvements of SNR at the expense of an increase in complexity. Adaptive time-frequency analysis by basis pursuit (BP) [9,10] is a secent technique for decomposing a signal into an optimal superposition of elements in an overcomplete waveform dictionary. This technique and some other related techniques have been successfully applied to denoising ultrasonic signals og taminated with grain noise in highly scattering materials [11,12], as an alternative to the W technique, the computational cost of algorithm being the main drawback

In this paper, we propose a cold morning pursuit-based signal processing mentions or improving SNR in ultrascold NDT of highly scattering materials, such a set and coen seites. Matching pusuit is used instead of BP to reduce the complexity. Desire its item in nature, the method is fast earligh to be real-time implemented. The performance of the proposed method has been evaluated as a south computer simulation and experimental rolls, i.e. when the input SNR NRin) is lower and 0dB (the level of echoes catter in ecceptations in the level of echoes catter in ecceptations.

2. Matching pursuit

Matching pursuit was introduced by Mallat and Zhang [13]. Let us suppose an approximation of the ultrasonic backscattered signals x[n] as a linear expansion in terms of functions $g_x[n]$ chosen from an over-complete dictionary. Let H be a Hilbert space. We define the over-complete dictionary as a family $D = \{g; i = 0, 1, ..., L\}$ of vectors in H, such as $\|g_i\| = 1$.

The problem of choosing functions $g_i[n]$ that best approximate the analysed signal x[n] is computationally very complex. Matching persuit is an iterative algorithm that offers sub-optimal solutions for decomposing states in terms of expansion functions chosen from a disponary, where I^i norm is used as the approximation metric because of its mathems call continuence. When a well-designed diction by is used in containing pursuit, the non-linear nature of the algorithm leads to compact at leave and model.

In each set of the interfer procedure, vector $g_i[n]$ which give the largest over product with the analysed signal is bosen. The contribution of this vector then subtracted from the signal and the process is repeated on the residual. At the with iteration the bidue is

$$r^{-1}[n]$$

$$\begin{cases}
x[n] & m = 0, \\
r^{-1}[n] + \alpha_{\text{GMOSOM}}[n], & m \neq 0,
\end{cases}$$
(1)

where $\alpha_{(m)}$ is the weight associated to optimum atom $q_{(m)}[n]$ at the with iteration.

The weight d_i^n associated to each atom $g_i[n] \in D$ at the with iteration is introduced to compute all the inner products with the residual $r^n[n]$:

$$a_i^m = \frac{(r^m[n], g_i[n])}{(g_i[n], g_i[n])} = \frac{(r^m[n], g_i[n])}{\|g_i[n]\|^2}$$

 $= v^m[n], g[n]).$ (2)

The optimum atom $g_{(i \neq i)}[n]$ (and its weight $\alpha_{(i \neq i)}$) at the with iteration are obtained as follows:

$$g_{dm}[n] = \arg\min_{\vec{q} \in D} ||P^{m+1}[n]||^2$$

 $= \arg\max_{\vec{q} \in D} ||a_i^m||^2 = \arg\max_{\vec{q} \in D} |a_i^m|.$ (3)

The computation of correlations $(r^{\mu}[n], g_{\mu}[n])$ for all vectors $g_{\mu}[n]$ at each iteration implies a high computational effort, which can be substantially reduced using an updating procedure derived from Eq. (1). The correlation updating procedure [13] is performed as follows:

$$\langle r^{m+1}[n], g_i[n] \rangle = \langle r^m[n], g_i[n] \rangle$$

 $-\alpha_{ij+1} \langle g_{jmi}[n], g_i[n] \rangle$. (4)

An article in which the authors committed plagiarism: it will not be removed from ScienceDirect ever. Everybody who downloads it will see the reason for the retraction...

Signal Processing

Volume 86, Issue 5, May 2006, Pages 962-970

Figure Manipulation – <u>some</u> things are allowed

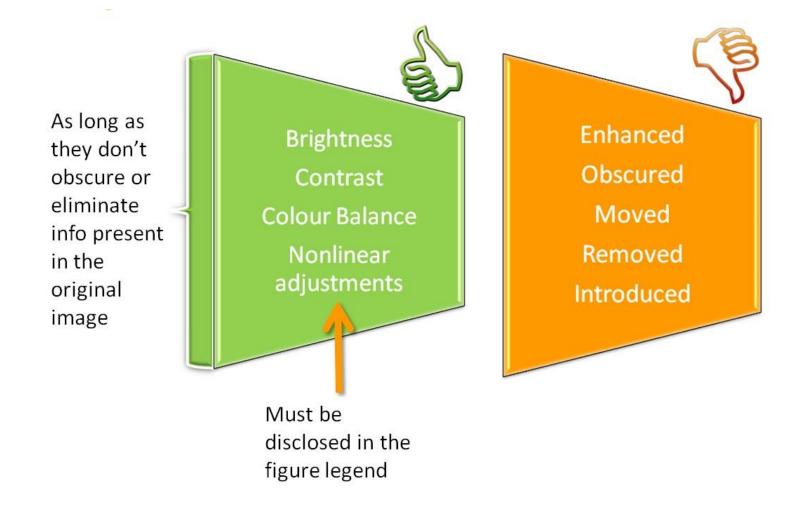
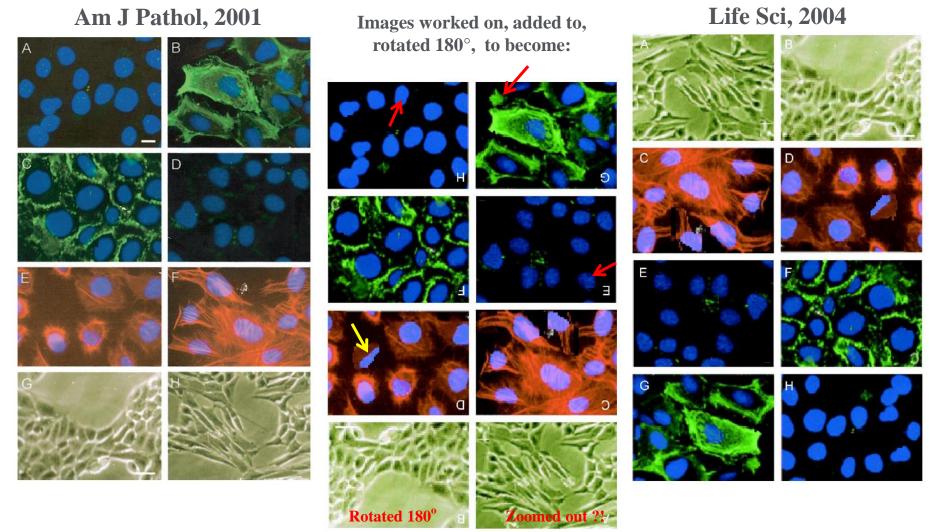


Figure Manipulation: Example - Different authors and reported experiments





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Questions?

Or for questions later, please contact a.newman@elsevier.com



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