



# Writing and Publishing a Scientific Paper

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# Reasons

- Scientific responsibility
  - Integral part of the research process
- To advance the field
- Bring clarity to research
- Prove you did it first
- Your image in the scientific community
- Academic currency

# Types of Published Material

- Conference proceedings
- Letters
- Full articles
- Review articles
- Book chapters
- Books
- Patents

# Process

- Do experiment
- Pick journal
- Write paper
- Submit
- Editorial process
  - Keep it in mind when writing paper
- Receive and correct proofs
- Pay page charges
- Published

# How to Pick a Journal

- Content and style
- Format
- Impact factor
- Audience
- Turnaround time
- Past publications
  
- Open Access Journals

# What Do I Need ?

- Clear understanding of topic
  - Clearer papers will be read by more people
- Know the audience
  - Put yourself in their shoes
  - How much did you know when you started?
- Know what your contribution is
- Tell a story
  - Don't want mystery novel, but make it captivating

# Building Up Your Paper (1)

- Read journal's information for authors
  - Helps tune the writing
  - Provides precise style
  - Follow it carefully
- Read other papers in journal / field
- Select key ideas to report
- Select data to support ideas
- Decide on how to present data
- Choose examples to present

# Building Up Your Paper (2)

- Write outline of paper
- Choose references to include
- Expand each section into rough draft
- Verify logical flow of ideas
- Edit / re-edit draft several times
- Write abstract
- **Proof read very carefully**
  - Might need help with language
- Work iteratively to obtain optimum manuscript



# Sections

- Abstract (written last)
- Introduction
- Methods, materials, set-up
- Results and discussion
- Conclusions
- References

# Title

- Trade-off between length and specificity

# Abstract

- Concise summary
- Available in indices
  - Remainder not indexed
- The only part that is freely available
  - The rest costs \$\$
- Indexing terms also available freely
  - Less important today
- Not an introduction, not a motivation
- First sentence is a summary of entire paper

# Abstract Example

Intellectual property is the most valuable asset of a country, a company or an individual. It takes a lot of hard work, money and countless resources to create intellectual property. As the technology becomes more and more sophisticated, the threats to this invaluable intellectual property increase. The threats can be unprecedented because of the fact that there is a phenomenal increase in level of data stored on servers, hard disks, flash drives etc. There is a great need to protect such an invaluable resource from getting into wrong hands. In order to enable intellectual property protection, a novel counter based watermarking approach is proposed in this paper. With the help of this approach, it is possible to prove the theft of intellectual property in a court of law, hence proving the ownership and retaining the royalty that comes from the use of those inventions. The proposed approach is compared with the existing approach and is shown to be efficient in terms of hardware requirement, invisibility and robustness to the user. The proposed technique causes absolutely no hardware overhead as compared to the existing technique which causes a hardware overhead of 300%.

# Introduction

- Why should I care, why should I bother
- Context: what other work was done before
  - Literature review
  - How does it fit with previous work ?
  - What is new ?
- Technique
- Outline: “Tell them what you’re gonna tell them”
- 90% of readers will only read this section

# How to Start ?

“Power Management is considered one of the hot topics in the integrated circuits research recently.”

“We present circuit design techniques that enhance the output power of switched capacitor charge pumps.”

# Starting Sentence

- Avoid
  - Marketing speak
  - Platitudes
  - Things that 100 other papers said
- Instead
  - Concise summary of the key idea

# Literature Review

- Survey of relevant publications
  - Guide the **learning** of readers
  - Give credit
  - Place your work in the larger context
- Don't repeat their terminology
  - Translate into your language
- Motivate their work
  - Also explain differences to your work



# Methods, Materials, Setup

- Enough detail for someone to duplicate your work – tough
- Quantify and measure everything
- Suppliers, model #, lot # (usual in chemistry journals)

# Results and Discussion

- What you found
- What it means
- Be honest
  - Don't hide data
  - Suggest alternative hypothesis
- Tell a story “this leads to that ...”
  
- Paper will be available for many years ...
  - No chance to do corrections (except by publishing an erratum)

# Conclusions

- “Tell them what you told them”
- What did you do, what did you find?
- Implications
  - Don’t promise future publications
- Why it is important
  
- 90% of the readers will only look at intro and conclusions
  - Summarize your findings succinctly
  - Give a take-home message

# References

- Follow style of journal
  - Description from journal web site
  - Very finicky
- BibTex is your friend
  - Or EndNote, Reference Manager, RefWorks
- Build your bibliography **when you start** the literature search

# Why Add a Reference ?

- Justify a claim
- Give credit
- Help those who want to learn more
- Show that you are aware of these methods
  
- For reviewers

# General Comments

- Your image in the scientific world
  - Be careful
- Archival quality
- Be brief, explicit, clear, not cryptic
  - Aim for precision
- If not clear: research \$\$ wasted, long page charges
- Clearer means more people will read it

# Editing

- Paper not written in one shot
- Edited over and over again
- Make it more clear
- Make it more concise
  - E.g. “Spectroscopy is a tool that can be used to analyze gas compositions”
- Paper will evolve significantly from first draft

# Can be Shortened

- Alternative choice
- Mix together
- Closely scrutinize
- Past experience
- Join together
- Unfilled vacancy
- Personal belongings
- Fully recognize
- A considerable amount of
- A majority of
- A number of
- At this point in time
- Due to the fact that
- First of all
- Has the capability of
- In many cases
- Of great theoretical and practical importance



# Watch for Over-Used Words

- It has long been known that...
  - I haven't bothered to look up the original reference
- Of great theoretical and practical importance
  - Interesting to me
- The W-Pb system was chosen as especially suitable to show the predicted behavior...
  - The fellow in the next lab had some already made up
- Three of the samples were chosen for detailed study
  - The results of the others didn't make sense and were ignored
- Typical results are shown
  - The best results are shown

# Watch Out (continued)

- Presumably at longer times
  - I didn't take the time to find out
- These results will be reported at a later date
  - I might get around to this sometime
- It is suggested that...OR It is believed that...Or It may be that
  - I think
- It is generally believed that
  - I have such a good objection to this answer that I shall now raise it
- It is clear that much additional work will be required before a complete understanding
  - I don't understand it

# Watch out (continued)

- Unfortunately, a quantitative theory to account for these effects has not been formulated
  - Neither does anybody else
- Correct within an order of magnitude
  - Wrong
- These were published as jokes [C.D. Graham Jr. 1957]... but they're fairly true

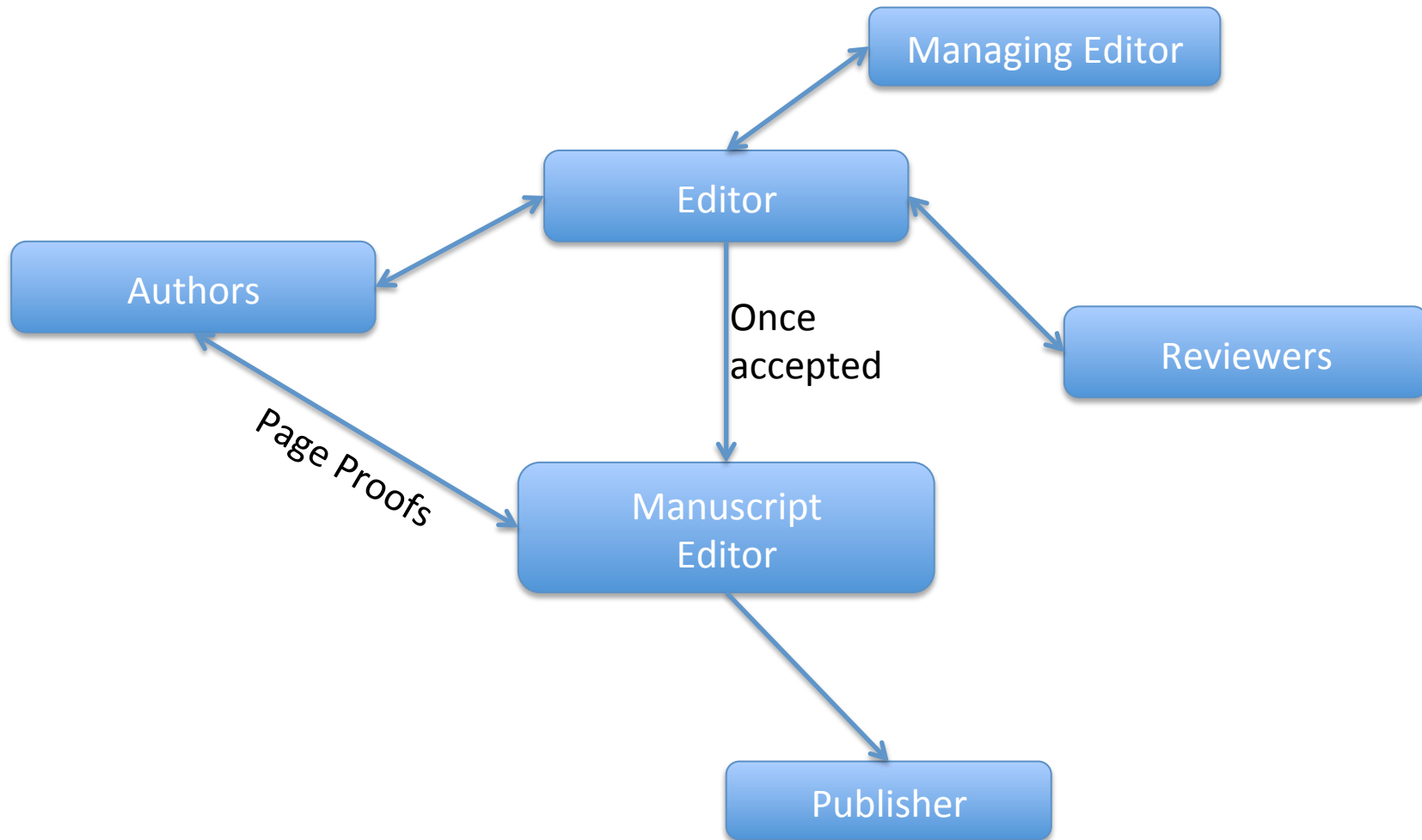
# Submitting Manuscripts

- Information needed:
  - Title, authors
  - Subject area / section on journal
  - Why you submit to this journal ? (very brief)
  - Suggested reviewers
  - Reviewers to avoid
  - Anything else to help editor

# Editorial Process

- Peer review
  - Sent to reviewers
  - Receive opinion
  - Decision of the editor
  - Receive notification
  - Revise, resubmit
- Receive proofs to correct
- Page charges (> \$1000)
- Published

# The Editorial Office



# Roles

- Editor
  - Makes decision, asks reviewers for help
  - Often a volunteer, senior in profession
- Reviewers (referees)
  - Your peers
  - Make recommendation to editor
- Managing editor
  - Paid professional
  - Administrative / clerical duties
- Manuscript editor (copyeditor)
  - Improves styles, small mistakes for publication

# Choice of Reviewers

- Others who publish in the field
- Others who publish in this journal
- Your citations
- Your suggestions
- Journals often keep databases of names
  - Include information on past quality, etc.



# Working with Editor / Reviewers

- Editor's goals:
  - Publish great science
  - Improve the status / quality of journal
  - Steer direction of journal
  - Reduce publication delays
  - Conserve resources (reviewers)
- Reviewer's goals:
  - Get it done quickly
  - Reduce number of bad papers published
  - Help authors publish a better paper

# Contents of a Good Review

- Brief, neutral summary of paper
- Main contributions of paper
  - What did the reviewer find important in paper
- Recommendation to editor, with justification
- List of explanations of major issues
- List of minor issues
- Constructive criticism
  - Unclear explanations, wrong order, lack of example, etc.
- Focused on the work, not on the person

# Example Review Questionnaire

- Reviewer's Recommendation
- Comments to authors
- Confidential comments to editor
  - The subject is worthy of investigation (1 to 5)
  - The information was new (1 to 5)
  - The conclusions were supported by the data (1 to 5)
  - Was there a conflict of interest (financial or other)?
  - Other confidential comments

# Types of Answers

- Accept as is (very rarely)
- Accept with modifications
  - May or may not go back to reviewers
- Reject, but may reconsider upon resubmission
- Reject and will not reconsider
  - Editor thinks it's not important enough for the journal's standard
  - Or quality is very poor

# Dealing With Rejection

- “It’s only failure if you don’t learn from it”
  - After Henry Ford
- Read comments carefully
- Wait a week
- Read comments again
  - Fix the parts were they are right
  - Explain the parts that they didn’t get
- Chances are your new paper will be much stronger

# Resubmitting

- Need:
  - New version of the manuscript
  - Letter explaining what you did / your arguments
- Be sure to address **every point** of the reviewer
- Answer reviewers' questions in **both**:
  - Your letter
  - The revised manuscript
- Do it **quickly**
  - Hope to get same reviewers

# Answering Reviewers

- If reviewer misunderstood:
  - Readers will misunderstand
  - Explain point more carefully
- If request minor modifications / additions:
  - Do it – no point in arguing
- If request major additional work:
  - Can do the work – paper will be much better
  - Or re-work – include as much as possible and make rest more clear

# Resubmission Letter

- Tactful – avoid arguments
- Polite
- Firm
- Clear
- Appreciate their effort put into your paper
- Don't say the editor is wrong
- If necessary can disagree with reviewer



# Proofs

- After acceptance of paper
- Quality control is your responsibility
- Respect their deadline
- Do not add new material / make significant changes

# More Information

- Matt Might: [matt.might.net/articles](http://matt.might.net/articles)
  - Lots of good information
  - General topics for grad students
- R.A. Day and B. Gastel “How to Write and Publish a Scientific Paper,” Greenwood, 2011.