

How to Write **Good** Papers

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Outline

- 1 Philosophy of paper writing
 - Have correct understandings on paper writing
- 2 About reviewers
 - Something you should know about reviewers
- 3 Components of a paper
 - Paper structure and general tips for every component
- 4 Paper writing process
 - How to manage your writing process
- 5 Writing good English
 - General tips and good habits
- 6 Conclusions
 - Key message on paper writing



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Why write papers? (1)

- Incorrect answers:
 - I have to graduate/promote
 - My boss asked me to write



Why write papers? (2)

- Correct answers:
 - Claim your credit on new findings
 - Critical for your academic career
 - Help refine your thought

I hear and I forget;
I see and I memorize;
I write and I understand.
 - Documentation
 - Guard against forgetting
 - Informative for other people (save your time to explain repeatedly)
 - Necessary in many other cases (such as patent filing)



When to write papers? (1)

- Incorrect answers: I have to start because
 - I will graduate half a year later
 - the conference deadline is only a month away



When to write papers? (2)

- Correct answers: I can start because I
 - have passion with my invention/concept
 - am compelled to speak and write
 - have truly novel concept/algorithm/procedure/architecture
 - have vision or survey that provides value for the research community
 - have solid and sustainable results



Elements of a good paper

- Good content:
 - Right subject matter
 - Well-defined problem
 - Clear contributions
 - Reliable and reproducible results
- Good writing skills:
 - Good organization and logical flow
 - Clear explanation and strong argument
 - Good illustration and intuitive notation
 - Smooth and error-free English (including punctuations!)



Misconceptions

- The more ideas, the better
 - One problem, one solution in a conference paper
 - One problem, more complete solutions in a journal paper
- The bigger claim and selling, the better
 - Neither over-claim nor under-claim
- The more complex, the better
 - Keep it simple, perhaps stupid
- The more authoritative, the better
 - Be modest and avoid excessive use of own references



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About reviewers

- Reviewers are volunteers
 - Do not assume that the reviewer is an expert of your problem
- Reviewers are busy
 - Make your paper easy to read and follow
- Reviewers are potential competitors
 - Respect related work and the reviewer



What does a reviewer look for?

- Is the paper within the scope of conference/journal?
- New problem or new solution?
- Are the main results significant?
- Is the paper technically correct?
- Are the experiments convincing/reproducible?
- Does the paper provide a fair assessment of its strength and limitation?
- Is the paper clearly written, thus accessible to general readers?
- Are the references adequate?
- ...



Misconceptions

- Reviewers will carefully read my paper
 - A reviewer often has a pile of papers to review
 - A reviewer typically makes up his/her mind after 5-minute browsing
title/author->abstract->conclusions->references
->introduction, then spends < 1h to justify
(moving to main body of the paper)
- Your action:
 - make your points EARLY
 - bring up your results QUICK
 - highlight your contributions FAST
 - make your paper easy to read, clear to follow, and good to learn



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Components of a paper

- Title
- Abstract
- Introduction
- Previous work
- Body
- Experimental results
- Conclusions/discussions/future work
- References
- Appendices



Title

- Purpose: summarize your paper in less than a sentence
 - Usually after the whole paper completes
- Do:
 - Be short
 - Be easily memorizable and comprehensible
- Don't:
 - Be ambiguous and misleading



Abstract

- Purpose: Give overall picture, entice readers
- Do:
 - Be brief but informative
 - Give relevant high-level descriptions
 - Highlight your contributions
 - Indicate why your work is new and better
- Don't:
 - Paste from introduction or conclusions
 - Give details



Introduction

- Purpose: motivate and justify your work
- Do provide:
 - background of your problem
 - why your work is important
 - highlight your contributions, but neither over-claim nor under-claim
 - related work and distinction from similar work
 - technical sketches
- Optional:
 - Roadmap of your paper
 - Illustration of your ideas/logics



Previous work

- Purpose: present the related work to justify your novelty
 - Could be an independent section or a part of introduction
- Do be:
 - relevant
 - comprehensive
 - respectful to those authors
- Don't:
 - hide related work that you know
 - overly self-cite
 - harshly criticize the work by others



Body

- Purpose: explain the technical details
 - Be reproducible
- Do be:
 - logical
 - simple yet clear
 - complete
 - relevant
- Use:
 - block diagrams, table, pseudo-codes, illustrations, figures, and examples



Experiments

- Purpose: validate your claims
- Do:
 - provide the complete details of experiments
 - be fair and complete when compared with other algorithms
 - pay attention to the visibility (color, contrast, labels, font size, and line style) of the results
 - describe tables and figures in text
 - interpret the results (what, how, and why)
- Use:
 - table and figures (blowups) to present the results



Conclusions/Discussions/Future Work

- Purpose: last chance to impress the readers; show the limitations, the effects of assumptions, alternative techniques, or possible extensions; attract the reader to follow your work
- Do:
 - highlight your contributions again
 - be concise and informative
 - be honest and pertinent



References

- Purpose: present the materials to back up your paper
- Do:
 - be complete and relevant
 - cite all the references and comment on those closely related papers in Introduction, Previous Work, or Body
 - frequently refer to the related papers



Appendix

- Purpose: present the details that may hinder reading flow if presented in Body
- Do:
 - pay attention to the self-consistency and the level of details



Examples (1)

- “This paper has ten contributions...” → Focus on the most important contribution.
- “This is a breakthrough/revolution/paradigm shift...” (only when yourself deeply believe in this) → “This paper presents a novel idea on...”
- “It is the best/first-ever...” → “To the best of our knowledge, it is the best/first-ever...”
- a pile of math formulae → intuitive explanations after the formulae



Examples (2)

- (title) “Multiplicative Kernels: Object Detection, Segmentation and Pose Estimation”



Examples (3)

- “A Discriminatively Trained, Multiscale, Deformable Part Model”: (abstract) This paper describes a discriminatively trained, multiscale, deformable part model for object detection. Our system achieves a two-fold improvement in average precision over the best performance in the 2006 PASCAL person detection challenge. It also outperforms the best results in the 2007 challenge in ten out of twenty categories. The system relies heavily on deformable parts. While deformable part models have become quite popular, their value had not been demonstrated on difficult benchmarks such as the PASCAL challenge. ...



Examples (4)

- “NLP-Enabled Information Retrieval”: (introduction) The traditional IR models do not employ NLP techniques because NLP techniques are *not robust, reliable and not practical enough* for processing large corpora. ...



Examples (5)

Appendix

A.1 Matlab Implementation

```
function dist = procrustes_distance(X1,X2)
[m,k] = size(X1);
I_k = eye(k);
A = X1'*X2;
dist = trace(I_k - A'*A);
return;
```

Table 4. Matlab code for Procrustes Distance between orthonormal matrices X_1 and X_2

In this section, we give Matlab code to compute the Procrustes distance between two points on the Stiefel manifold. There are three versions of the Procrustes distance corresponding to the three types of constraints discussed in section 3.3. In table 5 we provide code corresponding to the first constraint, which we have used in our experiments.



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Phases of paper writing

- Prewriting efforts
 - Read materials
 - Record ideas
- Draft
- Collect materials
 - Complete related work
 - Doing/enhancing/recording experiments
- Enrich
- Fill in experimental results
- Revise
 - Read your paper as if you are not an expert in this topic
 - To find out the best organization and
 - which part should be detailed and which part should be bony.
- Edit



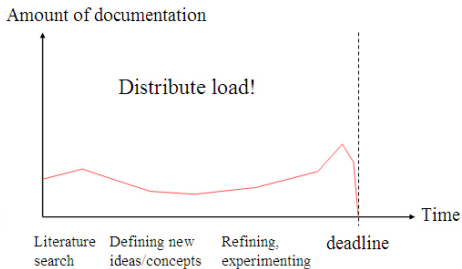
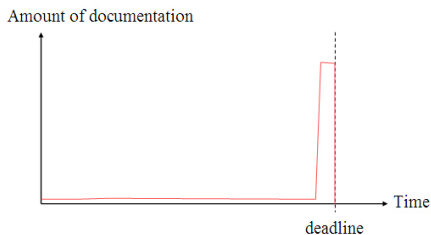
Writing order

- Different people have different writing order. Choose the one you feel comfortable.
 - top-down (skeleton first, then fill)
 - bottom-up (details first, then reorg)
 - linear (progress from begin to end)
 - random
- My writing order:
 - Frequent documentation
 - Body part
 - Illustrations
 - Complete literature survey
 - Introduction and Reference part
 - Experiments
 - Title, Abstract, Conclusion, and Appendix
 - Revise and Edit



Two key issues

- Frequent documentation
- Distribute writing time



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General Tips

- Never write Chinese version first and then translate to English
- Use only those words and phrases you are familiar with
 - but avoid using repeated words and phrases
- One paragraph, one main point
- Avoid casual writing
- Avoid extreme words, e.g., “absolutely”, “no doubt”
- Avoid long, convoluted sentences
- Have connecting statements between sections and paragraphs
- Make correct transitions and conjunctions
- Proofread carefully, including punctuations



Recommended techniques

- Never think of relying on others
- Use good papers as samples (mark the good words, sentences and transitions)
- Record your mistakes and eliminate them
- Keep the revision history by others and record why
- Use spelling check tools before final submission
- Reviewing papers helps



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Conclusions

- Writing refines your thought and improves your understanding
- Write only when you want to
- Good paper = good content + good English
- Reviewers are busy and also your potential competitors
- Make your paper logical, simple, and complete
- Frequent documentation is important; distribute your writing time
- Don't rely on others
- Revise, revise, and revise!



References

- Sing Bing Kang, A Perspective on Doing Effective Research
- Ya-Qin Zhang, How to Publish a (Good) Paper?
- Ashley Chang, English Writing



Thanks!

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