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How to Get Good Research Published ?

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Outline

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- Patenting in Research
- Publication:
  - ✓ Why to write a paper
  - ✓ When to write a paper ?
  - ✓ What is a good paper?
  - ✓ How to get a good paper published?

Patenting in Research

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- Patents are an major part of a company's IP
- Keep your employer in an advantageous IP position
- Protect your employer's interest in the market place
- A major measure of our impact and success

Patent Filing: Processes

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- Write down clearly the idea as a pre-disclosure, and present to patent coordinator and your research manager
- Review importance of idea
- Meeting with patent attorney
- Following up with attorney in revising draft
- Sign off the filling

Patent Filing: Rules

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- Ideas with potentially high significance in product impact;
- Not obvious, no priori art, but avoid search
- Experimental testing not always necessary
- Patent is not a paper, only people who contributed to the ideas qualifies for an inventor

Protect Company IP, cont.

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- Protect others' IP:
  - ✓ Not bring IP (source codes) from previous job;
  - ✓ Be careful when using public domain code;
  - ✓ No public domain code in product
  - ✓ Don't ask/hire other companies' confidential information;
  - ✓ No illegal copy of software;
  - ✓ Be careful on copy right: be careful in using other's content

坚持最高的研究标准

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- Target on most prestigious conferences and journals
  - ✓ Number does not count
  - ✓ Be referred is the measure
- Keep highest standard in paper writing
  - ✓ English is not the problem of preventing good papers
  - ✓ Seriousness is essential
  - ✓ Read it

How to Write A Good Paper

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- Importance of Paper-writing Skills
- What Makes a Good Paper
- Why is it so Hard to Write Good Papers?
- How to Improve
- A Template for Good Papers
- Avoid Run-on Sentences
- Summary

Importance of Writing Skills

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- Publishing papers is critical for researchers
- Publishing is hard
  - ✓ Low acceptance rate
  - ✓ Competing with good papers
  - ✓ Reviewers are potential competitors

What Makes a Good Paper

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- Good paper = good content + writing skills
  - ✓ Content and results: your job
- Writing skills: Structure, flow, argument, …
  - ✓ Logical, clear, succinct, consistent, …
  - ✓ English
- Standard must be high
  - ✓ Your best efforts
  - ✓ Compared with others, yours is good/best
  - ✓ Don’t fool with the reviewers!

What is a Good Paper ?

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- Right Subject Matter
- Well-Defined Problem
- Simple and Compelling
- Clear Contributions
- Reliable and Reproducible Results
- Repeatable Procedure
- Good structure and logic flow
- Frequent Referrals

A few misconceptions

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- The more, the better
  - ✓ Many new ideas
- The bigger, the better
  - ✓ A revolution, a breakthrough, paradigm shift, …..
- The more complex, the better
  - ✓ Lots of math, theory, and formulas
- The more selling, the better
  - ✓ First-ever, the best, unprecedented
- The more authoritative, the better
  - ✓ Excessive use of own references and previous work

When to Write a Paper ?

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- Passion with your research subject
- Truly novel concept/algorithm/procedure/architecture
- Vision and survey that provide value for the research community
- Solid, mature, and sustainable results
- Compelled to speak and write

Process of Writing a Paper

(My own experience)

Top-down refinement

- A 3-4 level outline, adjust many times
- Start on Introduction, Previous Work, ...
- Last: Summary, Abstract, (rethink) Title

Why Is It hard?

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- Who are our readers/reviewers
- Differences between thought and language
- We are the “sales person”
- Revisions: never be perfect
- Our English is bad, but …
- Nothing can replace experience, but …

How to Improve: In Readers' Shoes

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You know your work, but not your readers !

- Reviewers/Readers: in the same broad area, but have not worked on your problems
- Define terms, write about motivation and rationales, pose potential questions and answer them yourself
- What are **your** contributions?
- Show your elegance? Don't!
  - Unless for pure math, or when you are really famous

A Reviewer's Comments

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This paper attempts to explain the success of Naive Bayes classifiers by showing that …

Unfortunately, this paper was extremely difficult to follow. In fact, it took several readings before I even understood the paper's basic claims. The paper should have stated, at the beginning, that it is focusing on the representational (as opposed to learnability) issue: … It would also have been useful to connect this notation with something practical--for example, …

The arguments and proofs were difficult to follow. They would probably have been easier if the paper had first outlined their structure, before giving the details. …

How to Improve: What Reviewers Want

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Reviewers (partial) check list:

- **Does the paper introduce a new problem or provide a new solution to an existing one?**
- **What is the main result of the paper?**
- **Is the result significant?**
- **Is the paper technically sound?**
- **Does the paper provide an assessment of the strengths and limitations of the techniques/result?**
- **Is the paper clearly written so as to accessible to most AI researchers?**
- **Does the paper reference appropriate related work?**
- **Should the paper be nominated for a prize?**

How to Improve: Sell Our Work

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- Unless it is an invited paper…
- Purpose driven: debating: why are we good
  - ✓ Logical flow
    - **–Problem X is important**
    - **–Previous work A, B, … have been studied**
    - **–A, B have certain weakness**
    - **–We propose our new method D**
    - **–Experiment with D, compare with A, B**
    - **–D is better than A, B (rigorously tested)**
    - **–Why is D better? Why didn't E, F work?**
    - **–Strengths and weaknesses of D**
    - **–Future work of D**
- Simplest is the best: convey meanings
- Professional: no careless mistakes
  - – Proof-reading
  - – Proper use of words

How to Improve: Revisions

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- It is tedious to read own paper
- It is hard to find own mistakes
- A lot of efforts for small, last improvement
- Solutions
  - ✓ Let your paper sit (2 x 5 < 5 x 2)
  - ✓ Read it word by word
  - ✓ Ask others to read
  - ✓ Different roles of boss, colleagues, proof-reader
- Revise carefully > 3 times, total > 5 times

How to Improve: English

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- Myth: My English is weak, so I have excuse
  - ✓ Structure and logic: much more important
    - Your role; proof-reader won't help much
- Solutions:
  - ✓ Top-down organization, outline, logic, flow…
  - ✓ Use other good papers as "sample"
  - ✓ Use "cheap" English proof-reader

How to Improve: Experience

- It does take a lot of efforts to improve
  - ✓ Draft, revision, revision, revision, …
  - ✓ Write many papers to learn
- But there are ways to speed up
  - ✓ This lecture series
  - ✓ Books
  - ✓ Record your own mistakes; eliminate them!
  - ✓ Think about writing: 30%; writing: 70%

Solutions -- Why Is It hard?

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- Who are our readers/reviewers
- Differences between thought and language
- We are the “sales person”
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- Our English is bad, but …
- Nothing can replace experience, but …

Outline

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- Importance of Paper-writing Skills
- What Makes a Good Paper
- Why is it so Hard to Write Good Papers?
- How to Improve
- **A Template for Good Papers**

A "Template" for Good Papers

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- Abstract
- Introduction
- Review of Previous Work
- Our Work
- Experiments and Comparisons
- (Relation to Previous Work)
- Conclusions
- References
- Others (Appendix, footnotes, etc.)

Template - Abstract

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- Purpose: Summary of your work and contributions
- Style
  - ✓ What is the problem
  - ✓ What is your solution and results (example; note: left-click on example figures to get back)

Template - Introduction

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- Purpose: Background, outline of your paper
- Style
  - ✓ Problem X is important
    Previous work A, B, … have been studied
    A, B have certain weakness (be careful here)
  - ✓ We propose D, features of D (how much)
    Experiment with D, compared with A, B
    D is better than A, B (in certain aspects)
  - ✓ Outline of the paper; example

Template: Previous Work

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- Purpose: draw the differences
- Style
  - ✓ Previous work: may split to several classes, e.g.
  - ✓ Can review each work in one or several sentences
  - ✓ Compare to yours (refer to later sections)

    May also put it after sections about your work
  - ✓ Things to note:
    - Do not miss important ones. Proper use of "e.g."
    - Do not misinterpret; do not overly criticize
    - **Emphasize the differences** (example, bad example)

Template: Our Work

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- Purpose: describe our work – May split to several sections
- Style
  - ✓ Definition, notation (need motivation)
    - In the shoes of your readers
  - ✓ Algorithms: pseudo-code; diagram; explanations
  - ✓ Answer potential questions from readers; e.g.
  - ✓ Too much details (such as proof): appendix
  - ✓ Exceptions: footnotes

Template: Experiments

- Purpose: verifications
- Style:
  - ✓ Experiment design
    - Detailed enough: can others replicate your work
    - Simplest is best: concise, clear
  - ✓ Comparisons (Is it scientific? T-test? Example)
  - ✓ Discussions (make sense of the results)
  - ✓ Draw conclusions

Template: Conclusions

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- Purpose: summary, future work(e.g.), closing
- Style
  - ✓ Quick summary
  - ✓ Future work
  - ✓ Closing

Template: References

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- Purpose: supporting claims; know well all previous work
- Style
  - ✓ Citation in text: what needs to be referred?
    - Universally true: no need; opinions: YES
    - Other people's work: Yes
  - ✓ Consistent

Template: Others

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- Acknowledgements (example)
- Appendix
  - ✓ Proofs: do not stop the flow
- Footnotes
  - ✓ Hide details and exceptions

Abstract, Introduction, Summary

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- Similar in nature
- Differences (length; emphasis)
  - ✓ Abstract: short; problem and your work
  - ✓ Introduction: short or long; background, your work, outline of the paper
  - ✓ Summary: short/medium; your work, future work

Summary -- A Template

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- Abstract
- Introduction
- Review of Previous Work
- Our Work
- Experiments and Comparisons
- (Relation to Previous work)
- Conclusions
- References
- Others (Appendix, footnotes, etc.)

Run-on Sentences

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- Two clauses are connected incorrectly as one sentence (by using a comma)
- Examples:
  - Most researchers claim that the Naïve Bayes can only represent linear functions, they are not quite correct ...
  - It results in the problem of estimating the probability of unseen word pairs, that is, the pairs that do not occur in the training set.
  - The complexity is not linear, it is because …
- Why do Chinese often write run-on sentences?

【多維新聞社12日電】中文語音辨識軟體市場一年後將更加熱鬧滾滾。在中文語音辨識技術具世界領導地位的微軟中國研究院院長李開復表示，微軟的技術比現在已商業化的ＩＢＭ等都更佳，預計一年後將其中文話音輸入軟體商業化。而此將對廣大的華語人士帶來使用電腦的方便性。

中國時報十二日報導，微軟中國研究院是微軟在全球的四大先端技術研究中心之一，目前共有八十位研究人員，網羅了許多知名的華裔人才。像卡內基美隆大學電腦科學博士的李開復就發展出全球第一個以廣大詞彙、語料作連續語音辨識系統的人士，今年才卅八歲的他，在九八年被微軟邀請回大陸建置中國研究院。許多後進者都是以他的架構作語音輸入的開發研究。

Avoid Run-on Sentences

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- Use a “.”. Start a new sentence.
- “,” plus a connecting word: “but”, “because”,
- Use “;”: “; however,…”

Outline

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- Importance of Paper-writing Skills
- What Makes a Good Paper
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- How to Improve
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- **Summary**

Summary

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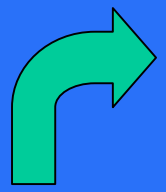
- Paper-writing skills are important
- Paper-writing skills can be learned
  - ✓ Think about our readers/reviewers
  - ✓ Thought and language
  - ✓ Flow: logical, convincing, consistent
  - ✓ Style: simple, clear, concise
- How-to-writing + writing = acceptance!



= Promotions

= Recognitions

Three Steps in Publishing a Paper

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- Before Submission – Choose a journal or conference
  - ✓ Journals -> for formal evaluation and archival
  - ✓ Conferences -> for quick presentation and interaction
- After Submissions – Communicate with Reviewers/Editors
  - ✓ Reviewers' comments
  - ✓ Revisions
  - ✓ Communications with Editors
  - ✓ Handling rejections
- After Acceptance – Expand the network
  - ✓ Paper referral
  - ✓ Follow-up work
  - ✓ Communications w/ Readers

Step 1: Before Submissions – choose the right publications

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- Types of Publications
  - Journals -> for archival
    - Correspondence; Regular paper; Invited paper
  - Conferences -> for presentation and interaction
    - Poster; Oral; Plenary; Keynote
- Factors to Consider
  - Subject Matter
  - Prestige and Impact
  - Exposure and Visibility
  - Timeliness and Responsiveness
  - Your circle of Influence

After Submissions

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- ✓ Reviewers' comments
- ✓ Revisions
- ✓ Communications with Editors
- ✓ Handling rejections
- ✓ Building a network

A Technical Journal

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- Sponsors and Publishers (e.g. IEEE, ACM, SPIE)
- Editorial Board
  - ✓ Editor-in-Chief (1-2)
  - ✓ Associate Editors (20-30)
  - ✓ Publication Editor (1)
- Reviewers (200-500)
- Authors
- Readers

Editorial Board

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- Editor-in-Chief
  - ✓ Appoints Associate Editors
  - ✓ Manages budget and operations of the journal
  - ✓ Resolves disputes between authors and AE
  - ✓ Makes final decision on paper acceptance and publications
- Associate Editors
  - ✓ Assigns reviewers
  - ✓ Bridge between authors and reviewers
  - ✓ Makes recommendations on the paper acceptance/rejection
- Publication Editor
  - ✓ Handling all logistics on manuscripting, proofreading, and publications after acceptance

Review Process

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- 1: Submit your paper to the Editor-in-Chief (EIC)
- 2: EIC assigns a responsible Associate Editor (AE)
- 3: AE identifies 3-5 anonymous reviewers
- 4: AE makes a preliminary decision based on reviewers' comments
  - ✓ Acceptance (w/o or w/ minor revisions)
  - ✓ Major revisions (=> Step 3)
  - ✓ Rejection
- 5: AE makes final recommendation to EIC regarding the status of the paper
- 6: EIC makes the final decision and inform the author
- 7: Author then works with the Publication Editor (PE) to get the paper published

Reviewers

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- Experts and peers with in-depth technical knowledge on the subject
- Gives objective and professional assessment and feedback on the manuscript
- Typical reviewers
  - ✓People who published several papers on the same subject (e.g. by AE knowledge, your reference, …)
  - ✓People who have no direct conflict of interests w/ you
    - (not: your colleagues, your advisor/students, your relatives,…)
  - ✓People w/ different mix of background and seniority
    - (e.g. one big shot, 1-2 active researchers, and 1-2 post-PhD type)
  - ✓People who are within easy reach of the AE

An Example: IEEE T-CSVT Review Form

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REVIEWER'S EVALUATION

OF INTEREST TO CSVT READERS:
[ ] wide interest
[ ] limited interest (for specialists only)
[ ] little or no interest

METHODS USED:
[ ] new and/or innovative
[ ] elegant
[ ] routine
[ ] clumsy and/or unskillful
[ ] other

NOVELTY OF RESULTS:
[ ] new
[ ] perhaps
[ ] old

REFERENCES:
[ ] adequate
[ ] inadequate

ACCURACY OF MAIN RESULTS:
[ ] correct
[ ] incorrect

CLARITY OF PRESENTATION:
[ ] good
[ ] fair
[ ] poor

CONCISENESS:
[ ] overly verbose
[ ] satisfactory
[ ] overly concise

An Example: IEEE T-CSVT Review Form

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REVEWER'S RECOMMENDATION

[ ] Accept
[ ] Accept after a minor revision. Checked by
  [ ] Associate Editor only
  [ ] Associate Editor and reviewer
    (not an option for Transactions Letter)
[ ] Reject. Resubmit it after a major revision
  (not an option for Transactions Letter)
[ ] Reject
[ ] Submit to another journal _____

PLEASE GRADE THIS PAPER

[ ] 1. Outstanding* (Award Quality)
[ ] 2. Significant* (Accept)
[ ] 3. Moderately Significant*
[ ] 4. Marginal
[ ] 5. Not Significant (Reject)
[ ] 6. Erroneous or Trivial (Reject)

Rebuttal

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- When You submit a rebuttal
  - ✓ Point-by-point detailed response to each reviewer
  - ✓ Constructive and positive
  - ✓ Clear and to-the-point
  - ✓ Responsive (< 1 month)
- It's fine to disagree with the reviewers, AE may be on your side
  - ✓ If there are many disagreements, exchange emails w/ AE in advance, to minimize the # of rounds
  - ✓ You need to make some compromise, but not on principles
- It's your paper !

Handling Rejections

- Understand that most papers (> 70%) are rejected by a premier journal (e.g. IEEE Trans)
- No feeling of shame or losing face
- Thank AE/reviewers for their dedications
- Ask AE what changes I can make for resubmission, redirection to another journal, or withdraw
- Display class and style – walk away amicably

After Acceptance

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- Taking care of the logistics – precise, complete, and responsive
- Follow up your own work if appropriate
  - ✓ Indicate the relevance in your EIC cover letter
- Pay attention to follow-up work by others
- Pay attention to paper referral
- Communicate w/ readers
- Expand your network

Conclusions

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- Good research is the pre-requisite
- Solid contents are essential
- Good writing techniques are critical
- Effective communications skills are necessary
- Quality > Quantity
  - ✓ Understand why to publish
- Building and expanding YOUR network of influence

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Happy Paper Writing!

Thank You!

Other Paper Writing Topics

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- ✓ How to write survey papers
- ✓ How to integrate research and paper writing
- ✓ Be scientifically rigor but not offensive
- ✓ Statistical tests for empirical experiments
- ✓ How reviewers accept and reject papers
- ✓ Sentences: templates and organization
- ✓ Professional writing: words to use and not
- ✓ Common mistakes/problems Chinese often make

Other Resources

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- Elements of Style, by William, Jr. Strunk, et al. 4th edition (August 1999)
- The Chicago Manual of Style: The Essential Guide for Writers, Editors, and Publishers (14th Edition)
- A manual for Writers of Term papers, Theses, and Dissertations, by Kate Turabian