How to Write Good Research Articles

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Publication Requirement

- MPhil Degree
- PhD Degree
- Full time researcher
Types of Scientific Publications

- **PhD/MPhil Thesis**
  
  Aspects to be assessed for a Thesis:
  - background knowledge
  - original contributions (must be clearly stated in the thesis)
  - methodology
  - presentation (writing)

- **Conference Publications**
  
  Focus on a piece of work with limited discussion

- **Journal Publications**
  
  More complete (extensive) discussion

- **Monographs / Book chapters / Text books**
Where to publish your work

- **Journals**
  - Ranking of journals
  - Review process of journals
  - Publication cycle

- **Conferences**
  - Ranking of conferences
  - Review process of conferences

N.B. a good journal / conference tends to have rigorous review process and long review time
## MARKED JOURNAL LIST

Sorted by: Impact Factor

<table>
<thead>
<tr>
<th>Abbreviated Journal Title</th>
<th>ISSN</th>
<th>2001 Total Cites</th>
<th>Impact Factor</th>
<th>Immediacy Index</th>
<th>2001 Articles</th>
<th>Cited Half-life</th>
</tr>
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<tbody>
<tr>
<td>IEEE T VIS COMPUT GR</td>
<td>1077-2626</td>
<td>425</td>
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<td>0.207</td>
<td>29</td>
<td>4.4</td>
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<td>157</td>
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<td>J CRYPTOL</td>
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<td>IEEE T SOFTWARE ENG</td>
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<td>0.292</td>
<td>65</td>
<td>9.8</td>
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</table>
Important journals & conferences

http://citeseer.ist.psu.edu/impact.html

- **Database**
  - IEEE Trans on Knowledge and Data Engineering
  - ACM Trans on Database Systems
  - Int’l Conf on VLDB

- **Software Engineering**
  - IEEE Trans on Software Engineering
  - ACM Trans on Software Eng. and Methodology
  - IEEE Int’l Conf on Software Engineering

- **Distributed Systems**
  - IEEE Trans on Parallel and Distributed Systems
  - ACM Trans on Computer Systems
  - IEEE Int’l Conf on Distributed Computing Systems

- **Computer Networks**
  - IEEE/ACM Trans on Networking
  - IEEE INFOCOM
  - ACM SIGCOMM, ACM Mobicom, etc.
  - ........
Plan your writing

- Ask two questions before starting:
  1) What is new in your work?
  2) What are you going to write?

- Organize your thinking and decide the structure (outlines) of your paper.

- Emphasize on the originality and significance of your work, and stick on your central points throughout the whole paper.

- Remove all unnecessary discussions that don’t contribute to your central points.
Simplicity is the key

Purpose of writing: disseminating your research results

- Don’t write if there is nothing to write
- Don’t hide technical details
- Don’t make a simple problem complicated
Reader-oriented Writing

Reader-oriented writing: to think from readers perspective, not simply throw out whatever you think.

- Always think how readers will interpret your writing (assume you’re the reader)
- Give enough and clear explanation (never leave readers to guess)
- Try to present your idea **accurately** (no ambiguous)
Use Simple English

Purpose of technical writing: express your idea correctly & clearly

- Use plain explanations
- Use short sentences
- Use simple expressions and words
- Avoid excessive use of notations and definitions
A Typical Review Form of a Journal

Section I. Overview

A. Reader Interest

1. Which category describes this manuscript?
   ___Practice/Application/Case Study/Experience Report
   ___Research/Technology
   ___Survey/Tutorial/How-To
   2. How relevant is this manuscript to the readers of this periodical?
      Please explain your rating.
      ___Very Relevant
      ___Relevant
      ___Interesting - but not very relevant
      ___Irrelevant

B. Content

1. Please explain how this manuscript advances this field of research and/or contributes something new to the literature.

…………

2. Is the manuscript technically sound? Please explain your answer.
   ___Yes
   ___Appears to be - but didn't check completely
   ___Partially
   ___No
A Typical Review Form of a Journal (cont’d)

C. Presentation

1. Are the title, abstract, and keywords appropriate? Please comment.
   _X_Yes
   ___No

2. Does the manuscript contain sufficient and appropriate references? Please comment.
   ___References are sufficient and appropriate
   _X_Important references are missing; more references are needed
   ___Number of references are excessive

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain your answer.
   _X_Yes
   ___Could be improved
   ___No

4. How would you rate the organization of the manuscript? Is it focused? Is the length appropriate for the topic? Please comment.
   _X_Satisfactory
   ___Could be improved
   ___Poor

5. Please rate and comment on the readability of this manuscript.
   ___Easy to read
   _X_Readable - but requires some effort to understand
   ___Difficult to read and understand
   ___Unreadable
A Typical Review Form of a Journal (cont’d)

Section II. Summary and Recommendation

A. Evaluation
Please rate the manuscript. Explain your choice.

___ Award Quality
___ Excellent
___ Good
__ Fair
___ Poor

B. Recommendation
Please make your recommendation and explain your decision.

___ Accept with no changes as a short paper
___ Accept with no changes as a regular paper
___ Accept if certain minor revisions are made
__ Author should prepare a major revision for a second review
___ Revise as a short paper
__ Revise as a regular paper
___ Reject

Section III. Detailed Comments

A. Public Comments (these will be made available to authors)

B. Comments to editors (these will not be available to authors)
Structure of a Paper

- Title
- Abstract
- Key words
- Introduction
- Related Work
- System Model & Problem Statement
- Methods / Solutions
- Simulations / Experiments
- Conclusion
- Acknowledgement
- References

Average number of pages of a journal paper
Average number of pages of a conference paper
Choose a Right Title

- The title should be very specific, not too broad.
- The title should be substantially different from others.

“Topology control of multihop wireless networks using transmit power adjustment”, *infocom’00*.
“Distributed topology control for power efficient operation in multihop wireless networks”, *infocom’01*.

- Avoid general / big titles, e.g.,

“Research on data mining”,
“Some research on job assignment in cluster computing”,
“A new framework for distributed computing”,

……
Write a concise Abstract

The use of an abstract:
- Searching papers from database.
- Giving readers a paper-summary before going into details.

An abstract should tell:
- What is the problem the paper discusses.
- What is the method used (or what work was done).
- What are original findings / achievements / advantages.

An abstract usually does NOT have:
- Reference numbers
- Multiple paragraphs
Choose a right set of keywords

- The use of keywords:
  database search,
  categorizing your work (for editors to choose reviewers).
- The keywords must be specific and, as a whole, represent the main topic of the paper.
- Avoid using the words that are not the main topic or too general, such as “calculus”, “simulations”, etc.
Examples of an abstract / keywords

Joint Access Point Placement and Channel Assignment for 802.11 Wireless LANs

Abstract—To deploy a multi-cell 802.11 wireless local area network (WLAN), access point (AP) placement and channel assignment are two primary design issues. For a given pattern of traffic demands, we aim at maximizing not only the overall system throughput, but also the fairness in resource sharing among mobile terminals. A novel method for estimating the system throughput of multi-cell WLAN is proposed. An important feature of this method is that co-channel overlapping is allowed. Unlike conventional approaches that decouple AP placement and channel assignment into two phases, we propose to jointly solve the two problems for better performance. Due to the high computational complexity involved in exhaustive searching, an efficient local searching algorithm, called patching algorithm, is also designed. Numerical results show that for a typical indoor environment, patching algorithm can provide a close-to-optimal performance with much lower time complexity.

Keywords—wireless local area networks; 802.11; access point placement; channel assignment

Optimal Routing, Link Scheduling and Power Control in Multi-hop Wireless Networks

Abstract—In this paper, we study the problem of joint routing, link scheduling and power control to support high data rates for broadband wireless multi-hop networks. We first address the problem of finding an optimal link scheduling and power control policy that minimizes the total average transmission power in the wireless multi-hop network, subject to given constraints regarding the minimum average data rate per link, as well as peak transmission power constraints per node. Multi-access signal interference is explicitly modeled. We use a duality approach whereby, as a byproduct of finding the optimal policy, we find the sensitivity of the minimal total average power with respect to the average data rate for each link. Since the minimal total average power is a convex function of the required minimum average data rates, shortest path algorithms with the link weights set to the link sensitivities can be used to guide the search for a globally optimum routing. We present a few simple examples that show our algorithm can find policies that support data rates that are not possible with conventional approaches. Moreover, we find that optimum allocations do not necessarily route traffic over minimum energy paths.

Index Terms—Wireless Networks, Multi-hop Networks, Routing, Scheduling, Power Control.
Organization of your Paper

- Top-down writing method
- Planning sections and subsections
- Sketching: use a sentence to represent the points (paragraphs) in each subsections
- Writing details: expend a sentence in the sketch into a paragraph
- Adjustment: break-down / merge paragraphs, add / merge sections

N.B. keep a *logical flow* from section to section, paragraph to paragraph, and sentence to sentence.
Introduction: the most difficult part

Purpose of introduction:

Introducing readers to your problem / work.

An introduction usually contains:

- Brief background of the topic-area
- Existing work, which would lead to the importance / objective of your work
- Description of your problem
- Achievement / significance / brief-methodology of work
Related work and Reference list

Proper selection of references:
- Show your knowledge in the related area,
- Give credit to other researchers (reviewers are usually chosen from the references),
- Cite good quality work (particularly when citing your own work) and up to date work.

Related work should:
- Be organized to serve your topic,
- Emphasize on the significance / originality of your work.

Format of references:
- Consistent with the format, ordering, etc.
- Standard format of books / journal papers / conference papers, e.g,
  J. Li, Yi Pan, and X. Jia, “Analysis of Dynamic Location Management for PCS Networks”,
  X. Jia, D. Li, X.Hu and D. Du, "Placement of Read-Write Web Proxies in the Internet",
- Do NOT use non-standard abbrev.
Examples of reference lists


Writing Tips: carry you to a long way

- Reader-oriented writing (good organization, logical flow, etc).
- Standard and consistent formatting (professional and neat looking).
- Learning from other people’s writing.