

Writing for Computer Science & Engineering

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Reading and Reviewing



Introduction – Reading

❖ Doing of research

- Investigation – running experiment, developing theory, doing analysis
- Takes time to acquire a deep of existing knowledge and limitation
- To acquire this understanding, you need to become an effective reader of research papers

❖ Good reader

- Identify the contributions and value of a paper
- Recognizing its flaws
- Uses critical scrutiny to identify the extent to which the flaws in a paper are serious.

**It is an introduction to the elements of effective reading,
and is a guide to reviewing.**



Introduction – Reviewing

❖ Reviewing

- Central part of the scientific process.
- Criticism and analysis of papers written by other scientists is the main mechanism for identifying good research and eliminating bad
- Demonstrate a thorough understanding of someone else's work
- Lead you to look at your own work from a fresh perspective
- Exposes you to different kinds of error or failure in research
- The average standard of work submitted for publication is well below that of work that gets published

**This chapter provides a perspective
on the standards expected of a submitted paper**



Research Literature – Reading

❖ Be confident that you have read and understood all of the scientific literature that has a significant connection to your work

- Your work is indeed novel or innovative
- Understand current theory, discoveries, and debates
- Identify newlines of questioning or investigation
- Provide alternative perspectives on your work

This reading will ultimately be summarized in the background sections and the discussions of related work in your write-ups



Searching of Research Literature – Reading

❖ Acceptable literature on which your work

- Refereed and published in a reputable venue,
- Theses that have been undertaken and examined at a reputable institution
- Books that are based on the information presented in refereed theses and books

❖ Evitable literature on which your work

- Lab notebooks, responses to a survey, or outputs from an experiment
- News articles, science magazines, Wikipedia pages, or documentation may alert you to the existence of reputable work, but is rarely worth citing



Finding Research Papers – Reading

❖ Discovery of hundreds of potentially relevant papers

- No textbook, no exam,
- No need to understand every lie
- The number of papers for particular project has to know well is usually small

❖ Become an effective reader

- Browsing to find papers and get an overview of activity and to understand the main outcomes in a body of work
- Focused reading of key or complex papers that stretch your abilities or the limits of your understanding



Finding Research Papers – Reading

- ❖ **Number of papers published in major computer science – at least tens of thousands**
- ❖ **Guide to earlier research – already explored in the older literature**
 - Carefully search for current work
 - Beware : reading about a paper that seems relevant is never substitute for reading the paper itself
 - Need to discuss – read it first



Finding Research Papers – Reading

❖ Comprehensive exploration of relevant literatures

- Use obvious search terms to explore the web
- Some of major search engines that search tools are superficially for academical papers
- Visit the websites of research groups and researchers working in the area
- Follow up the references in promising research papers
- Browse the recent issues of the journals and conferences in the area
- Search the publisher-specific digital libraries (IEEE, ACM, and www.arXiv.org)
- Most conferences have websites that list the program
- Consider using the citation indexes
- Go to the library
- Discuss your work with as many people as possible



Finding Research Papers – Reading

❖ Process of search and discovery

- A form of learning
- Refine your understanding of the terminology
- Help indicate which papers are significant
- Suggest new direction to follow up
- Clarify your criteria for whether a paper is “in” or “out”

❖ Some cases

- Several versions of the same paper; a preprint in an online archive, a conference version, and a journal version

❖ What does it mean “Relevant”

- Does the paper have interesting insights into other research literature
- Does it establish a benchmark
- Have the authors found a clever way of providing a theorem that you can apply in your own work
- Does the paper justify a decision to not pursue some particular line of investigation

Finding Research Papers – Reading

❖ **Finding all relevant work vs finding all significant work**

❖ **Searching vs reading**

- Mistake to try and do both at one
- Gather material and then later critically analyze and categorize
- Save the papers and understand what you have found
- In single search session, it is also helpful to restrict your attention to one or two specific topics

• **Cases**

- Discover that your original idea is not so original after all
- Be honest – review your work to see what aspects may be novel, but don' t fool yourself into working on a problem that is already solved
- Other people have worked on the same problem does not mean that it is impossible to make further contributions in the area



Critical Reading

❖ A key aim of reading

- Develop critical thinking skill
- Good researchers must demonstrate their ability to analyze the work and claims of others
- Become alert to common mistakes and bogus claims
- Work published in a reputable journal or conference is peer-reviewed
- Work more than one or two years old and have not been published in a significant venue probably has some serious defect

❖ Much research is misguided

- Investigate problems that are already solved and well understood
- Solve problems that technology has made irrelevant
- Don' t realize that the proposed improvement actually makes the method worse
- Mathematics may be pointless
- Wrong property may be provided such as complexity instead of correctness
- Assumptions may be implausible
- Evaluation strategies may not make sense
- Data set may be so tiny that the results are meaningless
- Some results are just plain wrong
- Many people undertake work that did not deserve to be written



Critical Reading

❖ Flaws in paper

- Mistakes are undiscovered and some issues unexplored
- Some aspects of older papers may be superseded or irrelevant
- May rely on limited or technically outdated assumption
- A paper can be seen as a snapshot of a research program at a moment in time

❖ Questioning, balanced, and skeptical

- Don' t accept something as true just because it was published
- Don' t justify researchers being dismissive of past work → respect it and learn from it
- Some inexperienced researchers see other work as either perfect or poor
- If many researchers trust a particular paper, it is still reasonable to be skeptical of its results



Reading by Critical Questions

- ❖ Is there a contribution? Is it significant
- ❖ Is the contribution of interest?
- ❖ Are the results correct?
- ❖ Is the appropriate literature discussed?
- ❖ Does the methodology actually answer the initial question?
- ❖ Are the proposals and results critically analyzed?
- ❖ Are appropriate conclusions drawn from the results, or are there other possible interpretations?
- ❖ Are all the technical details correct? Are they sensible?
- ❖ Could the results be verified?
- ❖ Are there any serious ambiguities or inconsistencies?



Reading by Critical Questions

- ❖ **Attempt to identify the contributions and shortcomings**
- ❖ **If the paper is important to your work, you should analyze it until you have formed a reasoned opinion about each of its components – if some components are questionable, this should be reflected in your literature review**
- ❖ **Write down your analysis of the paper**
 - Detailed analysis can be difficult before you have undertaken your own work and in so doing developed a mature perspective
 - Reviewing of literature should not stop when the investigation begins, but continue alongside the research



Developing a Literature Review

❖ Literature review

- A structured analysis of a body of literature
- Cover work from several separate areas of research
- No simply a list of these papers; Grouped by topic; discussed in a way that allows the reader to understand thier contribution to the field, their limitations, and the questions that they leave open

❖ Writing a literature review

- Begin a rough literature review as soon as you start reading
- Literature review will be sketchy and unstructured, but as you add papers you can group them by topic and contribution
- Add notes on each paper and how they relate to each other
- Briefly summarize each paper's contribution and the evidence as well as note any shortcomings or features

Keep in mind that your understanding of other work helps examiners to judge your abilities as a researcher



Developing a Literature Review

❖ Draft for literature review

- Focus on organization and content rather than on presentation
- Decide whether to include each of the papers you read -> how close some other work is to yours, how influential it has been
- Survey or recent paper with a thorough literature review
- In early draft, you are as inclusive as possible



Authors, Editors, and Referees – Reviewing

❖ Authors

- To be honest, ethical, and careful in their preparation of papers
- Ensure that the contents of a paper are correct
- Presentation is at an appropriate standard and it is their own work unless otherwise stated

❖ Referees

- Fair and objective, confidentiality, avoid conflict of interests
- Complete reviews promptly and recommend acceptance when they are confident that the paper is of adequate standard

• Editor

- Choose referees appropriately
- Arbitrate when the referees' evaluation differ
- Response for author's argue for incorrect evaluation



Authors, Editors, and Referees – Reviewing

❖ Different perspectives

Author	Referee and editor
Feel that the work is remarkable and perfected	Feel unexcited and disbelieving, Strong results are usually wrong
Sensitive to criticism	Sensitive to frustrating faults, and undue criticism for author' s literature review
Convinced that their papers are excellent and negative comments are misguided	
Seek ways to address issues raised by referees by making only minimal changes	



Contribution – Reviewing

❖ Contribution

- Main criterion for judging a paper
- Originality and validity

Originality	Validity
Degree to which the ideas presented as significant, new and interesting	Degree to which the idea have shown to be sound
Some degree extensions or variations of previously published work	A paper that does no more than claim from intuition is not valid
Interesting or important idea are more valuable than trivial increment	Demonstration by proof or analysis, modeling, simulation or experiment, several of these methods together
Excellent presentation can save a paper with marginal new idea	Demonstrates of validity should be rigorous : carefully describe and verifiable
Organization of exiting ideas in a new way or within alternative framework, reevaluation of existing ideas or methods	Use of theory and mathematical analysis for computer science, a paper reporting experimental work can be significant contribution



Evaluation of Papers

❖ Process of evaluating a paper

- Asking critical questions
- Is the contribution timely or only of historical interest?
- Is the topic relevant to the venue's typical readership?
- What is missing? What would complete the presentation? Is any of the material unnecessary?
- How broad is the likely readership?
- Can the paper be understood? Is it clearly written? Is the presentation at an adequate standard?
- Does the content justify the length?

Contribution, presence of a critical analysis



Evaluation of Papers

❖ Quality of paper

- Can be reflected in its bibliography
- How many references are there?
- The presence of only a few references may be evidence of bad scholarship
- Some authors cite a reasonable number of papers without actually citing related literature
- If many of the references are by the author, it may be that some of them are redundant
- If only a couple of the references are recent, the author doesn't appear to be familiar with other research
- Be suspicious of papers with no references to the major journals or conference in the areas



Evaluation of Papers

❖ Errors

- Search for errors that should be corrected before going into print
- Spelling and syntax, written expression, errors in bibliography, whether all concepts and terms have been defined or explained, errors in any formulas or mathematics, inconsistency in just about anything from variable names to formatting of the bibliography. Some of these kinds of errors may be picked up in the typesetting process
- if the paper is to appear in a journal, but many of them won't be.
- In particular, only a referee is likely to find errors in mathematics.
- If the subscriptions are mixed up or the notation keeps changing case then it is quite likely that the author has not checked the results with sufficient care
- It may well be reasonable to reject the paper and expect the author to review it before submitting again.



Evaluation of Papers

❖ Errors in presentation

- Poorly written paper can be accepted, but real incompetence in the presentation is grounded for rejection because a paper is of no value if it cannot be read
- Presentation does not justify the acceptance – well written and show real care in the development of the results, but which does no more than reproduce existing work -> regrettably be rejected

❖ Rejection vs. recommend resubmission after major changes

- Resubmission : a reasonable amount of additional work, the paper could be of acceptable standard -> involve substantial additional research and writing

❖ Be prepared to referee



Content of Reviews

❖ Two purposes for reviewing

- Decide whether papers should be accepted for publication
- Means of sharing expertise between scientists, via comments for the authors

❖ Review

- Make some kind of case about the paper; whether it is of an adequate standard and what its flaws are

❖ Two main criteria for measuring referees' review

- Is the case for or against for paper convincing?
- Is there adequate guidance for the authors?



Content of Reviews

- ❖ Is the case for or against for paper convincing?
 - The editor must be persuaded that it is of an adequate standard
 - Superficial comments with no discussion of the detail of the paper provoke the suspicion that the paper has not been carefully referred
 - A positive review should not just be a summary of the paper, it should contain a clear statement of what you believe the contribution to be
 - A clear explanation of the faults should be provided -> it is not reasonable to simply claim without references and explanation that the work is not original or that it has been done before
- ❖ Is there adequate guidance for the authors?



Content of Reviews

- ❖ Is there adequate guidance for the authors?
 - Should describe any changes required to fix residual faults or to improve the paper in any way, technically, stylistically
 - Should consider what the authors might do next – how they can proceed from the rejection to good research
- ❖ Two cases for improvement
 - Has some worthwhile core that further work will be acceptable -> how the authors should alter and improve their work
 - Nothing of the work is worthwhile -> explain to the author how to come to the same conclusion

Sometimes the referee just cannot tell whether there is worthwhile material because of defects in the presentation



Content of Reviews

❖ Importance of review

- Referees should help others to improve their work
- If a paper's shortcomings are not adequately explained, they will still be present if the paper is resubmitted
- Poor reviewing is self-reinforcing and is bad for scientific standards
- There is no further chance to correct mistakes – the referee is the last expert who will carefully examine the paper prior to its going into print
- No obvious mathematical errors, no logical errors in proofs, no improbable experimental results, no problems in the bibliographic, no bogus or inflated claims, no serious omission of vital information or inclusion of irrelevant text
- For the rejected paper, find-grain checking is not as important, but clear guidance on improving the paper is always welcome



Drafting a Review

❖ Example of review process

- Read the paper and make marginal notes then decide whether the paper should be accepted, then write the comments to the authors

❖ Lesson from the experience

- Be prepared to change their minds, and not commit too soon to a particular point of view
- Positive are as important as negatives -> possible to strengthen the paper anonymously on behalf of the author, valuable for authors to learn which aspects of their papers are good as well as which aspects are bad
- Some referees constructs flaws in papers where none exist
- If there is genuine problem, then describe it, preferably with examples
- A referee requires at least a passing familiarity with the literature
- Need to be polite

**It is not appropriate to make criticisms
those visible to the authors**



Checking Your Review

❖ Case of recommendation for acceptance

- Convince yourself that it has no serious defects
- Convince the editor that it is of an acceptable standing by explaining why it is original, valid, and clear
- List the changes, minor and major, that should be made before it appears in print
- Take reasonable care in checking details such as mathematics, formulas, and the bibliography

❖ Case of recommendation for rejection

- Give a clear explanation of the faults and discuss how they could be rectified
- Indicate which parts of the work are of value and which should be discarded, discuss what you believe the contribution to be
- Check the paper to a reasonable level of detail



Checking Your Review

❖ Either case

- Provide good references with which the authors should be familiar
- Ask yourself whether your comments are fair, specific, and polite
- Be honest about your limitations as a referees of that paper
- Check your review as carefully as you would check one of your own papers prior to submission



Example of Review System – Edas.info

<u>Relevance</u>	<u>Timeliness</u>	<u>Completeness</u>	<u>Originality</u>	<u>Related Works</u>	<u>Presentation</u>	<u>Recommendation</u>	<u>Familiarity</u>	<u>Consistency</u>
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Comments to authors (Please provide detailed comments to the authors.)



