
Research Paper Review

How to prepare and write critical review of a research paper?

Paper review component

- Critical review ¹ of one research paper every week
- Link to the papers will be available in the course web page
- Due before the Tuesday's class
- Read, understand and submit a review
- What to submit?
 - ◆ Interim notes
 - ◆ Final review
- Evaluation
 - ◆ Quality of the above two submission items

1. Timothy Roscoe, Writing reviews for systems conferences, <https://people.inf.ethz.ch/troscoe/pubs/review-writing.pdf>

Why read a research paper?

- Understand concepts
- Literature review
- Remain up-to-date
- Prospect new ideas
- Write research papers
- Review (as a reviewer)
- ...

How to read a paper: A three pass approach ¹

→ First pass

- ◆ Read title, abstract, introduction, section/subsection headings and conclusion
- ◆ Useful to categorize, list down the contributions
- ◆ You may decide not to read the paper further, why?

→ Second pass

- ◆ Read the remaining sections except the implementation details
- ◆ Carefully observe the figures, graphs etc.
- ◆ If you are still struggling?

→ Third pass

- ◆ At this point, you know answers to “why” and “what”
- ◆ Some idea/curiosity in your mind about “how”
- ◆ Read end-to-end to be happy, surprised or sometimes disappointed

Critical review

- Summary (3-5 sentences)
 - ◆ Your understanding of the paper in 3 to 5 sentences
 - ◆ **Not copy of abstract**
- Details (max 10 sentences)
 - ◆ Applicability
 - ◆ Assumptions
 - ◆ Contributions and their validations
 - ◆ Trade-offs
- Positives (3 bulleted lines)
 - ◆ **Unacceptable (for this course): generic/vague statements like “very well written”, “properly evaluated” ...**
 - ◆ Points related to novelty of the idea(s), comprehensiveness, design and implementation related, design of experiments

Critical review contd.

- Negatives (3 bulleted lines)
 - ◆ Unacceptable (for this course): generic/vague statements like “not understandable”, “writing can be improved”, “typos and grammar” ...
 - ◆ Hidden assumptions, negatively impacted use cases, compromise on scalability, security, performance ...
- Possible extensions (at least one)
 - ◆ Problem generalization and a possible solution
 - ◆ Specialized application of the idea
 - ◆ Improvement(s) to address the negative(s)
 - ◆ Tip: Think carefully about the feasibility, side-effects

Critical review howto

→ You have no choice to skip, so my take on multiple pass is slightly altered

STEP 1

→ Do not read abstract and conclusion

→ Read introduction, background, motivation and related work sections

- ◆ If you do not understand terminologies, see references, search web or engage !
- ◆ *Think, think and think* to make the following notes (part of interim notes)
- ◆ “Wow expressions”, “I wonder how expressions”, “Ohh. is it that simple expressions”, “buzzwords”, “what is the big deal expressions”, “Let us see how this paper tackles these cases”
- ◆ Make a note of the contribution claims (in your own understanding)
- ◆ Write down your thoughts on how the contributions can be validated

Critical review howto (contd.)

STEP 2 (Remaining sections)

- After each section
 - ◆ Revisit your interim notes
 - ◆ Think what has changed in your initial understanding
 - ◆ Keep on answering/commenting on the points (part of interim notes)
 - ◆ Add new points if any (part of interim notes)
- For design and implementation sections
 - ◆ Pause and think after every paragraph
 - ◆ Revisit previous paragraphs and figures if necessary
 - ◆ Possible optimizations, alternate implementations
- Evaluation section
 - ◆ Understand how the experiment relates to the contributions claim

Critical review howto (contd.)

STEP 3

- Write the final review
 - ◆ Refer to your interim notes
 - ◆ If you have followed step 1 and 2 diligently, it is easy now!
- Now you can read abstract and conclusion !

- Tips (my experience)
 - ◆ Avoid context switching
 - ◆ Be critical but keep an open mind

Review due for the following paper by 3.30pm, Tuesday, 09-JAN

Agile Paging: Exceeding the Best of Nested and Shadow Paging, Jayneel Gandhi et.al.
ISCA 2016 <https://dl.acm.org/citation.cfm?id=3001212>