How to review a paper
(and other assorted musings)

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April 24, 2019

(Note: this is based on my personal experiences as reviewer, program committee chair, associate editor, etc. YMMV.)

What purpose does reviewing a paper serve?

1. Help program committee / editors decide on acceptance

2. Give feedback to authors

3. Show that you (reviewer) have insights

Purpose 1: Help program committee decide

Who will read your review?

- Others who reviewed this paper
  - You may engage in a debate with them (maybe interactively), about paper merits
- PC chairs and other PC members, who haven't read the paper
  - Will learn about the paper only from your review

Purpose 1: Help program committee decide

What properties/components should a review have?

- Concise summary – to confirm that you didn't misunderstand the key point, to explain to non-readers what the paper is about

Purpose 1: Help program committee decide

What properties/components should a review have?

- Concise summary

- Pros and cons – **significant** scientific strengths and weaknesses
  - Can be about problem selection, experimental design, evaluation, presentation of results
  - Scientific novelty is important
  - Ethics are important
  - Paper may not know own strengths
  - Claims in review (particularly negative) should be substantiated
  - Avoid loud gripes about trivial things (e.g., punctuation)

Purpose 1: Help program committee decide

What properties/components should a review have?

- Concise summary

- Pros and cons – **significant** scientific strengths and weaknesses

- Explanation of judgment – why pros outweigh cons or vice versa
  - May be conditional – e.g., if the theorem is correct, if the code is released, if a specific aspect (that you're not able to judge) is novel

Purpose 2: Feedback to authors

What do authors need?

- To believe that paper was reviewed by experts who understood the paper and are providing constructive feedback
  - Why?
- If rejected, suggestion about either:
  - What it would take for the paper to be accepted
    - e.g., new experiment, different conference, different evaluation
  - Why the paper is unlikely to ever be accepted
- Whether accepted or rejected:
  Suggestions about how to improve the paper

Purpose 2: Feedback to authors

What properties/components should a review have?
- [all the previous ones]
- Detailed suggestions for improvement
- Constructive encouragement/discouragement
- Politeness!
- Understanding that even authors of bad papers may have tried their best

What properties should a review NOT have?
- Subjective statements about the reviewer (e.g., "I didn't like this at all")
- Unhelpful relative judgments (e.g., "worst paper I read")
- …

Purpose 3: Advertising reviewer

What does the reviewer need (from her own perspective)?

- To demonstrate to PC chairs, fellow reviewers: expertise, diligence, willingness to contribute to community
  - Knowledge of related work
  - Ability to differentiate between key aspects and cosmetic aspects
  - Good judgment in weighing contributions
  - Constructiveness

Purpose 3: Advertising reviewer

What properties/components should a review have?

- [all the previous ones]

Ethics considerations when reviewing papers

Reviewers have access to papers *only* for the purpose of reviewing
- Can't share paper, borrow key ideas, reject to give own paper better chance, …

Who should decide whether research was ethical?
- Reviewers?
- Program committee?
- Outside experts?
  - Lawyers? Ethicists? Subject-matter experts?
- Authors' Institutional Review Board?

In computer security and usable privacy/security, program committees may reject paper solely because of ethical issues