Paper Reviewing in Computer Science

Jan Van den Bussche

Databases and Theoretical Computer Science
Data Science Institute
Universiteit Hasselt

Peer review

- Is what drives scientific research in academia
- We read papers, are inspired by ideas and problems
- We propose some ideas, contributions to the problems
- Others who work on the topic judge our paper

Poll

- Who has already reviewed?

- Who has already received reviews?
  - So, you probably already have experience with good and less good reviewing!

Different levels

- Your advisor is asked to review and gives the paper to you
  - He remains responsible
- A program committee member of some conference asks you as an external reviewer
  - You are responsible
- The editor of some journal asks you as a reviewer
- You are on the program committee yourself and do most of the reviews yourself
- You may be an editor yourself
  - In the last two cases, you must interpret, evaluate reviews

Conference vs Journal papers

- A conference paper serves mainly to communicate the research to the community
  - Is this plausible, does it sound right?
  - Will it generate interest, excitement at the conference?
  - Does it fit the general area of the conference?
- A journal paper is the definitive report on a research project, the archival publication
  - Correctness checking is important here!
- We see some breaking down of traditional distinction (conference vs journal)
  - Some top conference proceedings go straight into a journal…

Benefits of reviewing

- You learn something new
  - Sometimes, really study on it!
  - But, if paper is really above your pay grade, OK to decline and return the assignment
- You are forced to scrutinize a paper thoroughly
- If you do a good job, the PC member or editor will remember your name
  - If you do a lousy job…

Downsides of reviewing

- It eats from your own research time
  - You are supposed to review 2 to 3 times as many papers as you submit yourself
  - Researchers who submit lots of papers should think about that!
- The deadline is inconvenient
  - Conferences have a deadline for the review to be returned
  - Also most journals do, but it is not so strict, you can ask for an extension
- Reviewing a bad paper may not be so fun
  - Still an important task to do right

Reading the paper

- First read it completely
- Or until you are ready to review
  - E.g., you encounter some fatal errors early on
  - Fine to stop at that point
- Write annotations, comments
  - On paper
  - In the PDF
  - Some reviewers do this very neatly and give a copy to the authors

Writing the review

- Sometimes there is a template, often quite loose
- Most of the time, you just write a free text
- Basic structure:
  - Recommendation (or a numerical score)
  - Summary
    - Informative for the authors how you have perceived the content of the paper
    - Can be brief
  - Main contributions
  - Main weaknesses
  - Detailed comments
    - Page 4, line 6; Page 20, line –10 (from bottom)
    - Or use section titles, paragraph counts, etc

The recommendation: the positive

- Accept
  - Just minor comments, or suggestions without obligation
- Minor revision
  - Should be published, but some things need to be corrected or improved
  - Editor may, or may not, ask you to look at the revision before accepting
- Major revision
  - There is value to the paper, there are ideas, or potential results
  - However, the execution has bad flaws, that are probably correctable (but may be a lot of work)
  - Most likely there will be a second round of reviewing
  - Used to be only for journals; now more and more conferences do it too

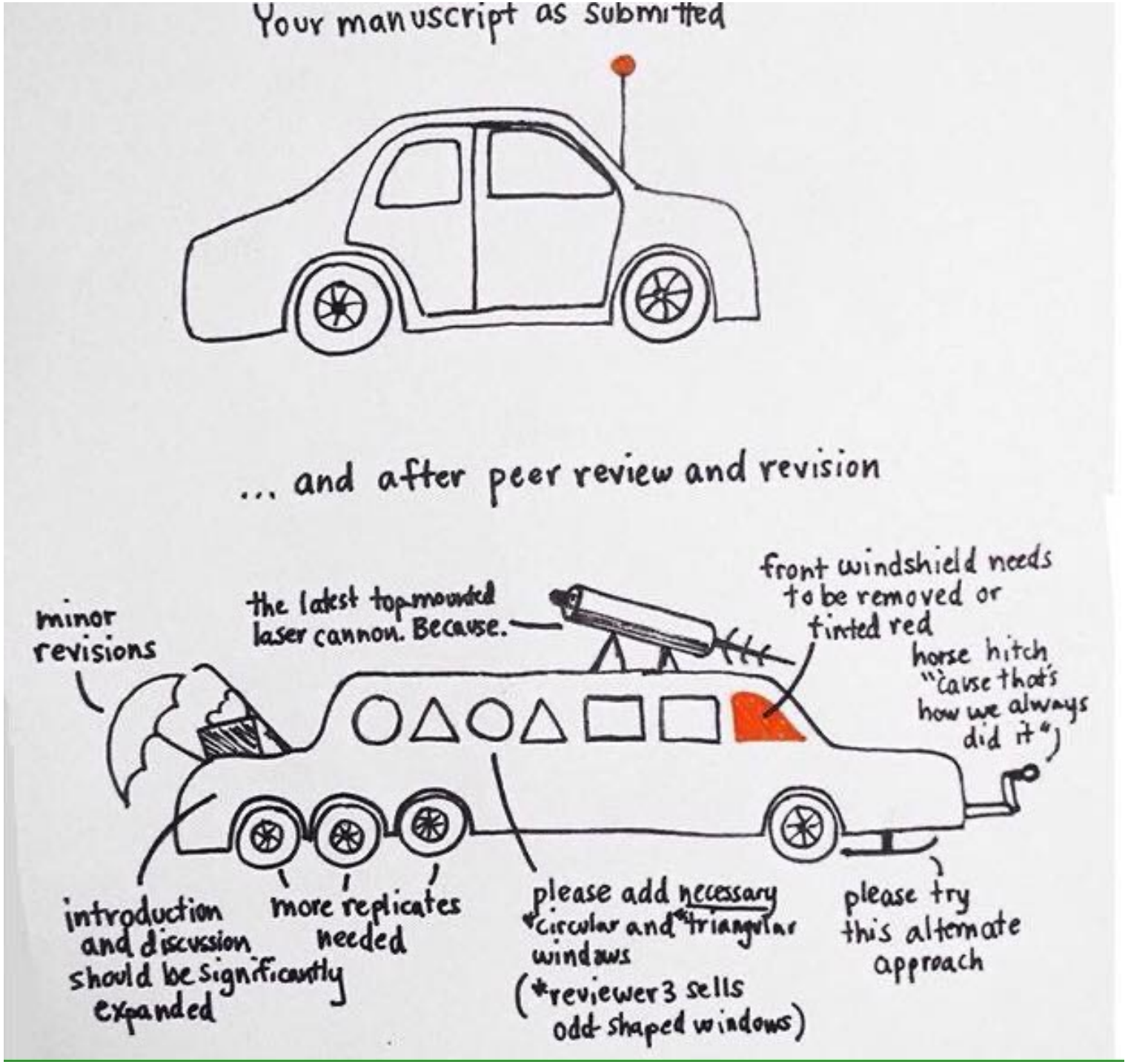
Recommendation: the negative

- Resubmit
  - There is an idea, but it doesn't work as envisaged by the authors
  - Paper could become an acceptable paper, but there is really new research to be done, without guarantee of success
- Reject
  - The idea is fundamentally flawed, or
  - The result is already known; the work has already been done earlier

- Conferences often use a **numerical score** instead of accept/revise/reject
  - Philosophy remains the same

Pitfalls for young (and not-so-young) reviewers

- “I reject this paper, because I could have done this myself”
- “Reject, because I knew this”
  - Or, because I am working on it myself!
- “It’s not enough: I ask for more work to be done”
  - Could be warranted, however:
  - Love your neighbor as yourself!
  - Asking for same or related experiments on larger data
    - Do you really think it may bring out new insights?
    - Or should the authors work as hard as your advisor made you work?
- Main judgement should be: **this is valuable to investigate, there is a nice new idea, and the idea is shown to be workeable**



Picture by
Ashley ML Guajardo

Writing quality

- A paper should be decently written, of course
- But it does not have to be Pulitzer-prize quality
  - The world's language is… Bad English!
- It is not strictly your duty to improve the writing in itself
  - Only if explanations are not clear
  - But you can signal it to the PC member or editor

Related work?

- Of course the paper should situate the problem they study within the research context
  - what is known, what's the question, what do we do
- However, not every paper needs contain 10 pages giving a complete survey of their topic!
- If authors are unaware of very relevant related work, be gentle
  - Should they really cite your work? Perhaps, perhaps not!
- You may even ask to **remove** gratuitous references

Contributing an idea as a reviewer

- Sometimes you like the paper, or it is very much in your expertise
- You can add something to the paper
- Put it in the review, and suggest to editor or PC member that they suggest authors to consider co-authorship, or collaboration
- Even if not really contributing an idea, a good review **helps** the authors
  - Regardless of accept or reject

Confidentiality

- The paper is given to you in confidence
- You should not talk about the paper to others
  - Except if the paper is already online
  - Or it is a clear accept
- You should not use the results in your own research
  - Until paper is published, or is online

Anonimity

- Single-blind reviewing
  - You know who the authors are, but they don’t know who you are
  - Don’t hide behind anonimity!
  - “Would I be embarrassed if my review were made public?”
    - Openreview.net
  - “Would I be embarrassed if my identity were disclosed afterwards?”
    - Some reviewers sign their reviews!
- Double-blind reviewing
  - Various studies show that this is more fair [Snodgrass, Tung]
  - It also just **sends a message** that what counts is the paper, not the fame of the authors
  - Even if it is **easy** to discover the authors
    - “Lightweight double-blind” many conferences follow this
    - Paper may be online with author names!

Reviewing crisis

- Some reviewers feel pressure to publish papers and neglect their reviewing
- Some reviews are obnoxious, or much too demanding
  - “Prestigious” conferences with 1000s of submissions have high **randomness** in set of accepted papers
  - However, there are also “we’re all friends” conferences…
- Many papers are only published in conferences
  - No journal versions; no full reports with detailed methodology or proofs
  - Correctness of results often questionable
- **Journal** reviewers take too long in Computer Science
  - Sometimes a year
- In natural sciences, publication is in journals only
  - Reviewer gets just two weeks!

Reviewing a research proposal

- Similar to reviewing a paper, except that results need not be there yet
- But authors should have demonstrated experience in the topic, and should indicate the methods they plan to follow or try out
- Is the budget reasonable?
- ”Revision” typically not an option
- Only **reject** if authors are clearly unaware of the field, objectives are off-target, or you feel such research should really not be done
  - Give positive feedback: what are they ignoring? What would be a better research question?

Finally…

- For your first reviews, ask your advisor or your close colleagues for feedback and advice!

References (all easy to google)

- Donald Knuth “Hints for Referees”
  - 1965, when Computer Science was still a young field, with few researchers
  - Still very relevant
- Parberry “Guide for New Referees in Theoretical Computer Science”
  - 1990s but still largely relevant and very detailed
  - Focus on TCS, but relevant for experimental CS too (just swap ”results” for “theorems” and “experiments” for “proofs”)
- Cormode “How NOT to Review a Paper”
  - Recent, and funny!
- Obnoxious reviewing:
  - https://www.protocol.com/workplace/how-i-decided-edward-lee
- Richard Snodgrass “Single versus Double-Blind Reviewing: An Analysis of the Literature”
- Anthony Tung “Impact of Double Blind Reviewing on SIGMOD Publication: A More Detail Analysis”
- Many, many more blogs, guides, etc., to google!