Research Methods in computer science
Spring 2024

Lecture 15

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March 6, 2024

Agenda

Conference updates

Paper review

HW7

How to Review a Paper?

- Form and Content

- Parts of a paper
  - What do you expect in each paper?

How to Review a Paper? - Considerations

Novelty

Importance

Generality

Rigor

Insights

Typical Template

Summary

Strengths

Weaknesses

Detailed Comments

Justification for these sections?

Some additional opinions
on paper review by other scientists...

I almost never print out papers for review; I prefer to work with the electronic version. I always read the paper sequentially, from start to finish, making comments on the PDF as I go along. I look for specific indicators of research quality, asking myself questions such as: **Are the background literature and study rationale clearly articulated? Do the hypotheses follow logically from previous work? Are the methods robust and well controlled? Are the reported analyses appropriate? (I usually pay close attention to the use—and misuse—of frequentist statistics.)** Is the presentation of results clear and accessible? **To what extent does the Discussion place the findings in a wider context and achieve a balance between interpretation and useful speculation versus tedious waffling?**

I subconsciously follow a checklist. First, is it well written? That usually becomes apparent by the Methods section. (Then, throughout, if what I am reading is only partly comprehensible, I do not spend a lot of energy trying to make sense of it, but in my review I will relay the ambiguities to the author.) I should also have a good idea of the hypothesis and context within the first few pages, and it matters whether the hypothesis makes sense or is interesting. Then I read the Methods section very carefully. I do not focus so much on the statistics—a quality journal should have professional statistics review for any accepted manuscript—**but I consider all the other logistics of study design where it's easy to hide a fatal flaw**. Mostly I am concerned with credibility: Could this methodology have answered their question? Then I look at how convincing the results are and how careful the description is. Sloppiness anywhere makes me worry. **The parts of the Discussion I focus on most are context and whether the authors make claims that overreach the data. This is done all the time, to varying degrees. I want statements of fact, not opinion or speculation, backed up by data.**

- *[Michael Callaham](), emergency care physician and researcher at the University of California, San Francisco*

Most journals don't have special instructions, so I just read the paper, usually starting with the Abstract, looking at the figures, and then reading the paper in a linear fashion. I read the digital version with an open word processing file, keeping a list of "major items" and "minor items" and making notes as I go. There are a few aspects that I make sure to address, though I cover a lot more ground as well. First, I consider how the question being addressed fits into the current status of our knowledge. Second, **I ponder how well the work that was conducted actually addresses the central question posed in the paper. (In my field, authors are under pressure to broadly sell their work, and it's my job as a reviewer to address the validity of such claims.)** Third, I make sure that the design of the methods and analyses are appropriate.
- McGlynn

First, I read a printed version to get an overall impression. What is the paper about? How is it structured? I also pay attention to the schemes and figures; if they are well designed and organized, then in most cases the entire paper has also been carefully thought out.

When diving in deeper, first I try to assess whether all the important papers are cited in the references, as that also often correlates with the quality of the manuscript itself. Then, right in the Introduction, you can often recognize whether the authors considered the full context of their topic. After that, I check whether all the experiments and data make sense, paying particular attention to whether the authors carefully designed and performed the experiments and whether they analyzed and interpreted the results in a comprehensible way**. It is also very important that the authors guide you through the whole article and explain every table, every figure, and every scheme.**

As I go along, I use a highlighter and other pens, so the manuscript is usually colorful after I read it. Besides that, I make notes on an extra sheet.
- *[**Melanie Kim Müller**](), doctoral candidate in organic chemistry at the Technical University of Kaiserslautern in Germany*

I first familiarize myself with the manuscript and read relevant snippets of the literature to make sure that the manuscript is coherent with the larger scientific domain. Then I scrutinize it section by section, noting if there are any missing links in the story and if certain points are **under- or overrepresented**. **I also scout for inconsistencies in the portrayal of facts and observations**, assess whether the exact technical specifications of the study materials and equipment are described, consider the adequacy of the sample size and the quality of the figures, and assess whether the findings in the main manuscript are aptly supplemented by the supplementary section and whether the authors have followed the journal's submission guidelines.
- *[Chaitanya Giri](), postdoctoral research fellow at the Earth-Life Science Institute in Tokyo*

I spend a fair amount of time looking at the figures. In addition to considering their overall quality, sometimes figures raise questions about the methods used to collect or analyze the data, or they fail to support a finding reported in the paper and warrant further clarification. I also want to know whether the authors' conclusions are adequately supported by the results. Conclusions that are overstated or out of sync with the findings will adversely impact my review and recommendations.
- *Dana Boatman-Reich, professor of neurology and otolaryngology at Johns Hopkins University School of Medicine in Baltimore, Maryland*

I generally read on the computer and start with the Abstract to get an initial impression. Then I read the paper as a whole, thoroughly and from beginning to end, taking notes as I read. For me, the first question is this: Is the research sound? And secondly, how can it be improved? Basically, I am looking to see if the research question is well motivated; if the data are sound; if the analyses are technically correct; and, **most importantly, if the findings support the claims made in the paper.**
- Walsh

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- Walsh

The main aspects I consider are the novelty of the article and its impact on the field. I always ask myself what makes this paper relevant and what new advance or contribution the paper represents. Then I follow a routine that will help me evaluate this. First, I check the authors' publication records in PubMed to get a feel for their expertise in the field. I also consider whether the article contains a good Introduction and description of the state of the art, as that indirectly shows whether the authors have a good knowledge of the field. Second, I pay attention to the results and whether they have been compared with other similar published studies. Third, **I consider whether the results or the proposed methodology have some potential broader applicability or relevance, because in my opinion this is important. Finally, I evaluate whether the methodology used is appropriate. If the authors have presented a new tool or software, I will test it in detail.**
- *[Fátima Al-Shahrour](), head of the Translational Bioinformatics Unit in the clinical research program at the Spanish National Cancer Research Centre in Madrid*

Some Questionable Ideas…

- A paper addresses a problem that will become important?

- A paper will become important to a community?

- A paper has lots of graphs and data

- The authors did a lot of experiments

Some Easier Ideas…

- Technical Claims
  - What are the claims?
  - Have the claims been validated?
    - Experimental
    - Data
    - Theory
- Technical Correctness

Conference / Journal Review process

TPC / EIC finds reviewers

Bidding / assignment process

The reviewers submit reviews

Disucussions online/in-person converging to a decision

Final decisions may have other considerations (e.g., scope, balancing the program, artifact requirement)

TPC Invitation - 1

IEEE INFOCOM is the flagship networking conference of the IEEE Communications Society. Next year, INFOCOM 2023 will be held in Tokyo, Japan, in the week of April 24-27, 2023. As a respected researcher and expert in networking, we would like to invite you to join the Technical Program Committee (TPC).

As a TPC member, you will play an important role in ensuring the high quality of the paper selection process. Should you accept this invitation, you will assume the following responsibilities:

1. Provide constructive, high-quality reviews of the assigned papers in a *two-round paper review process*. The load on each TPC member is expected to be around 10-13 papers in total.

2. Following the second-round review, participate in the online discussion for the papers which you reviewed, and provide inputs that would allow the area chairs to make recommendations.

3. Attend an online TPC meeting on Saturday, November 19, 2022.

Below is the current schedule of the review cycle:

- The INFOCOM 2023 TPC Informational Meeting will take place online on Friday, May 6, 2022 11:00AM-noon (EDT). The 2023 TPC members are expected to attend this meeting, if possible.

[…..]

- Update your Conflict of Interests in EDAS [.….]

- Paper submission deadline: Monday, Aug. 1, 2022

- Papers assigned to the TPC members for the first-round review: Monday, Aug. 8, 2022

- First-round paper reviews due: Monday, Sept. 12, 2022

- Papers assigned to the TPC members for the second-round review: Wednesday, Sept. 28, 2022

- Second-round paper reviews due: Wed. Oct. 19, 2022

- Online discussion phase: Oct. 19-Nov. 2

- Online TPC meeting: Saturday, Nov. 19, 2022

To accept or decline this invitation, please click on the link below and select the appropriate option:

Review Instruction - 1

- **Guidelines on the quality of INFOCOM reviews**

- Reviews with high quality is of utmost importance to IEEE INFOCOM, and the most important contributions that a member of the TPC can make to INFOCOM. Please avoid submitting short, unsubstantiated reviews, and do not cut and paste words and sentences across different categories.

- Try not to be overly negative, as any research paper has its advantages and drawbacks. Please write a review with the quality that you would expect for your own papers. Keep a fair and open–minded approach, favoring selection of breakthrough papers that can open new areas and new research directions. Please also follow a distribution curve (based on the definition for each rating on the review form) when rating the papers assigned to you. This is particularly important as each TPC member perceives the quality of a paper differently if the paper is rated in isolation. The Area TPC Chairs and the TPC co–chairs will read the submitted reviews, and monitor their quality.

https://infocom2020.ieee-infocom.org/guidelines-tpc-and-reviews.html

TPC Invitation - 2

We would like to invite you to join the Technical Program Committee of BuildSys'21 (https://buildsys.acm.org/2021/).

TPC members are a crucial part of the conference and ensure the high quality of the program. If you accept, you will be expected to review about 10 submissions (similar to previous years) including note, short, and full papers. The TPC meeting to discuss all the papers will be held virtually late August/early September. Other important dates of the conference are copied at the end of the email.

Please respond briefly to this email to confirm (or decline). We will create your hotcrp account afterwards for the conference submission page. Please also let us know your preferred email address for hotcrp.

Thank you
Om Gnawali and Zoltan Nagy
- TPC Chairs BuildSys'21

BuildSys'21 Important Dates

Abstract Registration: July 9, 2021, AOE.
Paper Submission: July 16, 2021, AOE.
Paper Notification: September 10, 2021, AOE.
Camera Ready Submission: October 1, 2021, AOE.

Review Instruction - 2

Thank you again for serving on the TPC for BuildSys'21. The paper reviews have been assigned now. Below are some points for the review process.

Please proceed to provide your expert opinion to ensure the high quality of BuildSys. In addition This should include
- A short summary
- Highlight the strengths/contributions
- A frank account of the weaknesses
- Comments to the PC to take into consideration (hidden from the authors)
- Whether or not the paper should be considered for best paper award (hidden from authors

….

Keep in mind that good reviews are not necessarily long reviews :). As in the past, we will also solicit review ratings through hotCRPs built-in feature.

As a reminder: Notes papers are 4-page papers intended to discuss preliminary research results, advocate new research directions, describe public software or datasets, or present short projects that do not warrant a 10-page paper. While Notes papers are not expected to have extensive evaluations, they will be reviewed based on the novelty of their ideas, potential for impact, and quality of presentation.

Poster Review

- Largely similar to paper review in terms of existence of different components

- Differences
  - Visual design
  - Oral presentation

HW7

System (Design)

Describe your system or approach in about one page.