Who can submit an excellent review for this manuscript in the next 30 days? – Peer Reviewing in the age of overload

Hamed Alhoori
Northern Illinois University
DeKalb, Illinois, USA
alhoori@niu.edu

Edward A. Fox
Virginia Tech
Blacksburg, Virginia, USA
fox@vt.edu

Ingo Frommholz
University of Wolverhampton
Wolverhampton, UK
ifrommholz@acm.org

Haiming Liu
University of Southampton
Southampton, UK
h.liu@soton.ac.uk

Corinna Coupette
Max Planck Institute for Informatics
Saarbrücken, Germany
coupette@mpi-inf.mpg.de

Bastian A. Rieck
Institute of AI for Health, Helmholtz Munich, Technical University of Munich
Munich, Germany
bastian@rieck.me

Tirthankar Ghosal
Oak Ridge National Laboratory
Oak Ridge, TN, USA
ghosalt@ornl.gov

Jian Wu
Old Dominion University
Norfolk, Virginia, USA
jwu@cs.odu.edu

ABSTRACT

With millions of research articles published yearly, the peer review process is in danger of collapsing, especially in "hot" areas with popular conferences. Challenges arise from the large number of manuscripts submitted, skyrocketing use of preprint archives and institutional repositories, problems regarding the identification and availability of experts, conflicts of interest, and bias in reviewing. Such issues can affect the integrity of the reviewing process as well as the timeliness, quality, credibility, and reproducibility of research articles. Several solutions and systems have been suggested, but none work well, and neither authors nor editors are happy with how long it takes to complete reviewing the submitted research. This panel addresses these challenges and potential solutions, including digital libraries that recommend reviewers, as well as broader issues like opportunities for identifying peer reviewers for scholarly journals by engaging doctoral students and postdocs, as well as those who recently completed their Ph.D.

1 GOAL AND OBJECTIVE

The panel aims to discuss how to improve the reviewing process in the digital library community and beyond, especially regarding journals. The objective is to trigger follow-up discussions and activities, for instance, by determining the need for a workshop or research initiative that would engage the digital library community in addressing challenges in scholarly publishing that surface regarding reviews.

2 AUDIENCE AND ATTENDEES

Since we are dealing with a topic many researchers face, we anticipate that many conference attendees will participate in the panel. We want to involve: administrators of journal editorial boards; members of technical program committees; people running preprint archives or institutional repositories; senior scholars who are overwhelmed with review requests; junior scholars who seek to be engaged in reviewing; and developers of digital library systems that might solve these challenges. The panel will include in-person and remote panelists. There will be polls and several short breakout discussions to ensure engagement.

3 OUTLINE AND TOPICS

Finding suitable reviewers who are capable and ready to deliver high-quality reviews on time is becoming more complex for several reasons. Some topics we plan to discuss at the panel include the following.

(1) **Scholarly big data and more submitted manuscripts**. The accumulation of the massive volume of scientific literature is now beyond the ability of any person to even skim over [5]. Staying up to date with the literature is a time-consuming process, and with more manuscripts to evaluate, this produces an information and work overload.
(2) **Finding qualified reviewers**. Identifying experts in an area is becoming challenging [2] as there is a limited number of experts in specific fields, and more researchers are working in multidisciplinary areas. Furthermore, the databases of possible reviewers only cover a small fraction of those who could do good reviews. It is hard to find and qualify recent Ph.D. graduates and others who should be added to reviewer pools. This hurts their careers and further imbalances the demographics of the process.
(3) **Availability of qualified reviewers**. Even in the case that potential experts have been identified, often they are busy with research, teaching, or service and can't complete the review within the time frame expected by the editors and authors. Even if experts are available for a first review, they might not be available for subsequent reviews.
(4) **Quality of reviews**. After inviting some researchers to review a manuscript and waiting for weeks, some completed reviews might be incomplete, inaccurate, unhelpful, or don't provide constructive feedback. In such cases, the editors might need to invite other reviewers, extending the review time. This highlights another issue, which is "Lack of Training," in the peer review process, as new reviewers might simply replicate random behaviors they have observed online (e.g., "this manuscript is outstanding" or "this manuscript doesn't meet the standards") without providing details.

(5) **Data about reviews** (who has done which ones and when, so requests can be suitably spaced) is highly distributed/fragmented. As a result, people are asked to do reviews for many different journals from diverse publishers, with no way to balance their service load or adjust it for academic calendars, program committee demands, etc.
(6) **Time-consuming process for editors**. Although editors and sub-editors usually need two to four reviewers on average, they might invite twenty reviewers, as many experts will decline to review, or agree to do the task but not turn in the review. This process takes a lot of time for the editors and authors as the reviewing process will be delayed.
(7) **Time-consuming process for reviewers**. The reviewing process has increased its standards over the years. Besides the need to provide constructive feedback, more scholarly venues are asking for additional information, such as reproducibility and/or availability of artifacts [3].
(8) **Reviewer fatigue**. There is a growing feeling of fatigue, exhaustion, and pressure as reviewers accept more and more manuscripts for evaluation, which ultimately affects the quality of reviewing. Some immediately decline to review a paper without even reading the abstract [4].
(9) **Research drift**. Building a list of potential reviewers is still not very useful since more and more researchers are shifting or expanding their research areas over time, making it harder for editors to find the right reviewers at any moment.
(10) **Conflict of interest**. As research is becoming more collaborative, it is common for reviewers to have conflicts of interest due to previous collaborations.
(11) **Bias in the review process**. In the single-blind review process, there is a higher potential for bias if the reviewers and authors had previous direct or indirect interactions. Even though the double-blind process could reduce such bias, it still can't eliminate the reviewers' bias if they have a strong positive or negative stance toward a topic, approach, methodology, or evaluation scheme. Such a lack of transparency might have adverse effects on the review process.
(12) **Lack of diversity**. The peer review process might be controlled by a small group of experts from certain universities or countries, or suffer from gender bias issues, which could reduce the fairness of the evaluation process.
(13) **Skip the peer review**. Some researchers might not see value in the peer review process and might use another dissemination approach that is not highly recognized either in academia or industry research.
(14) **Incentives**. The yearly global cost of reviewing research articles is estimated to be billions of dollars [1]. Some publishers provide reviewers free access to their journals or discounts on their books to express "thank you," but few reviewers take advantage of it.

4 PANELISTS

All members have confirmed hybrid attendance.

Hamed Alhoori (lead organizer) is an associate professor in the CS Department at Northern Illinois University. His primary areas of research interest include applied machine learning and the science of science. https://alhoori.github.io/

Edward A. Fox is a CS and ECE Professor at Virginia Tech. He is a founding member of JCDL and on its steering committee, serving on the IJDL Board and as executive editor of J-ETD. He is a Fellow of ACM and IEEE, as well as an inaugural member of the SIGIR Academy. He contributed to over 1250 papers/presentations/reports/etc. http://fox.cs.vt.edu

Ingo Frommholz is a Reader (Associate Professor equivalent) at the University of Wolverhampton. His research interests include information retrieval and digital libraries. He is senior managing editor of IJDL and co-organizer of the Bibliometric-enhanced IR workshop series. http://www.frommholz.org/

Haiming Liu is an associate professor and director of the Centre for Machine Intelligence at the University of Southampton. Haiming specializes in understanding users' preferences and behaviors during their information access. https://sites.google.com/view/haimingliu/

Corinna Coupette is a research associate at the Max Planck Institute for Informatics and a fellow at the Bucerius Center for Legal Technology and Data Science. She has won three awards for her research and a best reviewer award at the Learning on Graphs Conference 2022. https://people.mpi-inf.mpg.de/~coupette/

Bastian A. Rieck is the principal investigator of the AIDOS Lab at the Institute of AI for Health at Helmholtz Munich, focusing on topology-driven machine learning methods in biomedicine. https://bastian.rieck.me/

Tirthankar Ghosal is a scientist at the National Centre for Computational Sciences in Oak Ridge National Laboratory, US. His main research includes NLP and ML techniques for scholarly knowledge discovery and streamlining the peer review process with AI. https://member.acm.org/~tghosal

Jian Wu is an assistant professor of CS at Old Dominion University. His research interests include NLP and understanding, scholarly big data, information retrieval, digital libraries, and the science of science. He was rated the best reviewer in JCDL 2018. https://www.cs.odu.edu/~jwu/

REFERENCES

[1] Balazs Aczel, Barnabas Szaszi, and Alex O Holcombe. 2021. A billion-dollar donation: estimating the cost of researchers' time spent on peer review. *Research Integrity and Peer Review* 6, 1 (2021), 1–8.
[2] Bruce Alberts, Brooks Hanson, and Katrina L. Kelner. 2008. Reviewing Peer Review. *Science* 321, 5885 (2008), 15–15. https://doi.org/10.1126/science.1162115
[3] Odd Erik Gundersen and Sigbjørn Kjensmo. 2018. State of the Art: Reproducibility in Artificial Intelligence. In *Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence, (AAAI-18), New Orleans, LA, USA, Feb 2-7, 2018.* 1644–1651.
[4] Leanne Tite and Sara Schroter. 2007. Why do peer reviewers decline to review? A survey. *Journal of Epidemiology & Community Health* 61, 1 (2007), 9–12.
[5] ChengXiang Zhai and Sean Massung. 2016. *Text data management and analysis: a practical introduction to information retrieval and text mining.* Morgan & Claypool.