FAST principles for preprint feedback

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Abstract

There has been strong interest in preprint commenting and review activities in recent years. Public preprint feedback can bring benefits to authors, readers and others in scholarly communication, however, the level of public commenting on preprints is still low. This is likely due to cultural barriers, such as fear by authors that criticisms on their paper will bias readers, editors and evaluators, and concerns by commenters that posting a public critique on a preprint by a more senior colleague may lead to retribution. In order to help address these cultural barriers and foster positive and constructive participation in public preprint feedback, we have developed a set of 14 principles for creating, responding to, and interpreting preprint feedback. The principles are clustered around four broad themes: Focused, Appropriate, Specific, Transparent (FAST). We describe each of the FAST principles and designate which actors (authors, reviewers and the community) each of the principles applies to. We discuss the possible implementation of the FAST principles by different stakeholders in science communication, and explore what opportunities and challenges lie ahead in the path towards a thriving preprint feedback ecosystem.

Preprint feedback: new review modalities and increased interest in the context of the COVID-19 pandemic

The growth of preprints in the life sciences has brought with it opportunities to experiment with new modalities to appraise and provide feedback on scholarly work, supported by new digital tools for commenting on and engaging with research works. Platforms have emerged to provide support to these opportunities, for example, [Peer Community In](#), [PREreview](#), as well as journal clubs that have incorporated preprints into their discussions.

The COVID-19 pandemic threw the benefits and challenges of early research sharing into sharp focus. Motivated by an urgent universal challenge, scientists shared preprints at unprecedented rates. Journalists, policymakers, and general readers flocked to these documents (1), bringing about the question of how to manage the flow of information in the absence of traditional peer review. Rapid post-publication quality control mechanisms were in demand.

We have seen a high level of commentary and social media discussion on COVID-19 preprints during the pandemic (1). A variety of projects offered more structured feedback, including the Mt. Sinai Immunology Review Project (2), the [2019 Novel Coronavirus Research Compendium](#) at Johns Hopkins University, the overlay journal [Rapid Reviews COVID-19](#), and [Outbreak Science](#). Together, this expert commentary helped authors to improve or correct their papers. In an example from early in the pandemic, public critiques spurred, within 48 hours, the withdrawal of a problematic paper that suggested a relationship between SARS-nCoV-2 and HIV (3); in another later example, prompt critiques to a preprint reporting that vitamin D reduced mortality in patients with COVID-19 resulted in the preprint being removed; the study was later published in a journal with substantial changes in reporting that reflected concerns noted on the preprint (4). The public comments and reviews of preprints also helped readers (no doubt including journalists and policymakers) understand the state of the field and scientific consensus - or lack thereof.

While feedback on preprints is helpful to authors, bringing commentary, queries and critiques out into the open benefits a variety of stakeholders, as outlined in Box 1.

Box 1. Benefits of public commentary and reviews of preprints.

For **authors**, public preprint feedback can:

- Increase the rigor of scientific work because the research can be validated by others.
- Enable them to publicly rebut any concerns raised.
- Reduce rounds of re-review.

For **feedback providers and reviewers**, public preprint feedback can:

- Allow more researchers to comment and participate in the review process, including those from underrepresented groups, geographical areas or career stages, without restrictions on whether a journal has issued an invitation.
- Serve as a training opportunity, providing examples for those who are getting started in review activities and potentially lowering the barrier for participation.
- Enable feedback to be reused by journals or evaluators, reducing time wasted on rounds of review.

- Act as a sample of a reviewer's contributions, enabling journals to extend [invitations to join editorial boards or reviewer pools](#).

For **journals and publishers**, public preprint feedback can:

- Provide a pool of untapped experts, allowing them to [identify potential reviewers and editorial board members](#) from preprint feedback they have provided.
- Inform the decisions of editors at the triage stage or inform whether to invite the authors to submit the manuscript to their journal.
- Complement peer review reports commissioned by the journal.

For **readers**, public preprint feedback can:

- Provide context and expert evaluation of the work.
- Provide insights into how scientists discuss research.
- Give a check for any statements made in the media in relation to the work.

Encouraging public feedback

If rapid and open discussion benefited COVID-19 research, why is it not more common for preprints as a whole? Only 5-10% of bioRxiv and medRxiv preprints receive public comments (5,6). A survey of bioRxiv authors revealed that roughly 40% reported getting feedback either in private by email or through more informal channels, such as Twitter (7). This suggests that for many papers, there is feedback being exchanged, however, this is hidden from the public sphere where it could provide maximal transparency.

Cultural barriers likely influence participation in public preprint feedback. Authors may fear that competitors will leave unfair criticism, or that even fair criticism will bias readers like journal editors and evaluators: while nearly every paper will be thoroughly criticized during journal peer review, the rarity of this feedback being out in the open might lead some to believe that the paper receiving it is especially problematic. Potential reviewers, especially those who rely on more senior colleagues for career advancement, are concerned about retribution for public criticism, or simply harming their reputation by leaving uninformed feedback.

In order to overcome these concerns, we convened a working group to discuss how to alleviate the friction between the benefits of public preprint feedback across stakeholders vs. the cultural barriers that hold back participation by individual researchers, and to work on developing a set of behavioral norms to guide constructive participation in preprint review. The working group brought together relevant stakeholders (researchers, editors, preprint review platform and funder representatives) to discuss the challenges around participation in preprint review and explore what cultural norms could enable and foster further participation in public commentary and feedback.

We recognize that there are a number of existing guidelines for researchers in how to best engage with journal peer review, and that elements of journal review and preprint review will overlap. However, there are also some important differences: unlike public feedback on preprints, journal peer review 1) is moderated by editors and constrained by a recognized framework, 2) is entwined with a gatekeeping function that encourages reviewers to judge a paper and its suitability for a specific journal rather than simply seek to improve it, 3) is largely hidden from public view, and 4) often has restrictions about who can participate in the process, and how and when authors and reviewers can interact with one another.

This final distinction is the strength of preprint peer review: authors and reviewers can engage in an open dialog with one another, enabling more complete discussions. Further, not only can anyone participate, but anyone can step in to validate comments or challenge unfair feedback. Thus, community members are an important additional actor in public preprint review. They can help to add weight to valid feedback and reinforce constructive behavior. To use a journal analogy, in the context of public preprint review, every reader is the editor and can make decisions as to what elements of the feedback they agree or disagree with, but they also play an important role in fostering positive behaviors.

To inform its discussions, the working group collected available resources related to cultural norms and behaviors in the context of journal review, preprint commentary and review and broader engagement with the critique of published research. The collection of resources was guided by the knowledge and experience of the working group members, rather than aiming for a comprehensive search of the literature. Several working group members reviewed the collected resources for statements related to the behaviors recommended for the evaluation and review of scholarly work, and extracted relevant statements (the resources reviewed are available at asapbio.org/fast-principles-for-preprint-feedback#resources). The list of statements was then reviewed by working group members to check for redundancy and to consolidate them into broader principles. The initial draft of the principles was shared for public input and was discussed at a workshop during the #FeedbackASAP meeting in July 2021 (8). The working group further refined the list of principles based on feedback from the workshop and group discussions. The final list includes 14 principles, clustered around four broad themes: Focused, Appropriate, Specific, Transparent (FAST). We outline the FAST principles in further detail below.

FAST principles

Taking into account the unique features of public preprint review, the working group has developed principles for creating, responding to, and interpreting preprint feedback. The FAST principles apply to the different actors in the preprint feedback environment:

Author - Any of those listed in the authorship line of the preprint.

Reviewer - Anyone other than the author(s) who provides comments/feedback on the content and/or claims of the preprint; the feedback may relate to the full paper or to specific parts of the work.

Community - Anyone who engages with the preprint and the feedback on that work. This includes readers but also members of the research community or the public who interact with the authors and/or reviewers, for example, to provide praise, to call out inappropriate behavior or to comment on uses of the preprint and/or preprint feedback by non-specialists.

While some principles will be applicable to all actors, others focus on specific roles. Table 1 outlines the FAST principles and their context, and indicates which actors each of the principles apply to.

Table 1. FAST principles and the actors each principle applies to: author, reviewer, community.

FAST theme	Principles
Focused	Focus on the content of the preprint Feedback should focus on the paper as it stands, and not be driven by the reviewer's preferred line of research or their view on the study the authors should have conducted. The reviewer may suggest how the design or execution could have been stronger or how to expand the study, but requests that go beyond the paper's scope or that relate to perceived impact should be avoided or clearly designated as optional suggestions for a future study. The reviewer should consider whether suggestions for additional work are feasible vs. the study scope and context.
Focused	Focus on the science and not the journal Feedback on preprints should be journal agnostic and focused on the scientific work without specific journal criteria in mind. We should acknowledge that preprint feedback may take different forms compared to journal peer review, both in structure and scope: remarks on a preprint may focus on specific aspects of the work and not necessarily on the whole paper.
Focused	Focus on the scientific and not the personal Feedback must be objective and focused on the content of the preprint. Reviewers may raise comments about potential competing interests or concerns about deviations from best practice, but should avoid speculation about the authors' motivations or prejudices. Authors should be analytical about critiques on their work and not take feedback personally.
Appropriate	Polish the tone The tone of the feedback should always be polite, respectful and constructive toward the authors and anyone engaging in public discourse about the work. Reviewers and authors should be mindful of the impact language choices might have on the authors or readers. If a commenter would not share a comment in person, they should reconsider whether it should be included in the public feedback; all actors should reflect on the tone of their feedback to ensure it remains constructive and polite and to prevent misinterpretation.
Appropriate	Reflect on possible biases Reviewers should consider their motivation for providing feedback and reflect on any biases before, during, and after commenting, including aspects related to their own background, professional position, scientific or personal relationships or perception about the work's interest. The evaluation of the work should be the same irrespective of who the authors are, their background or seniority. Potential competing interests should be considered; if any competing interests, biases, or the limit to the reviewer's expertise might influence the feedback, the reviewer should disclose those or reconsider whether to provide the comments.
Appropriate	Engage in scientific discourse Public feedback on preprints is a form of scientific discourse and should be approached as such by all parties who engage in it. Authors, reviewers and the community should be willing to discuss their work/feedback with others (readers, authors, other reviewers, editors), provided the exchange aligns to the principles outlined here. Community members should approach the feedback as a possibility to witness, moderate or join a

	scientific discussion between authors and reviewers, and can also play an active role in the discourse e.g. curating a list of relevant preprints or applying the knowledge within specific comments to their research.
Appropriate	Behave responsibly and with integrity Anyone engaging in preprint feedback should behave with integrity, following ethical conduct expected in all research activities. All actors should commit to creating a safe and supportive space for everyone to take part in public preprint feedback. We should favor constructive critiques and disfavor bad reactions to critiques, feedback aimed at gaining a benefit or seeking to damage a competitor. All actors are responsible for ensuring their own feedback is polite and constructive, and for speaking out if others engage in inappropriate comments or interactions, to signal that such behaviors will not be tolerated and to provide support to anyone attacked by others for their feedback or subject to unreasonable criticism.
Specific	Make it useful Feedback should be specific, clear, actionable, and useful for the authors to improve the work. Comments should be outlined in a logical manner and substantiated with evidence. The clearer the feedback, the easier it will be for authors and the community to understand it.
Specific	Indicate if critical or optional Feedback may include a summary of major strengths and weaknesses of the preprint. In such cases, it is important to designate which critiques are major and affect the rigor of the study (flaws/controls) and which are optional or minor issues.
Specific	Assess whether claims are supported by the data An important element of reviews is to evaluate whether the study claims are supported by the data, it is thus relevant for public preprint feedback to contain comments about this. If the claims are not supported, the feedback can include requests for the claims to be revised or for new data to support the conclusions.
Specific	Be candid Be honest and candid; if the paper needs improvement, indicate so and specify how.
Transparent	Sign (or not) your feedback Public feedback is valuable to both authors and the community as it increases awareness and transparency about the scientific process. Reviewers may sign the feedback they post publicly if they are comfortable doing so. Reviewers who prefer to remain anonymous can include a statement about their background or expertise to place their feedback in context.
Transparent	Acknowledge oversights Embrace feedback; it is good practice to acknowledge any oversights in our work, either in the paper or in a review/comment. It is beneficial for the community to witness how reviewers and authors acknowledge any oversights, this helps create a culture of transparency and openness.
Transparent	Credit contributors Disclose and credit colleagues who contributed to the feedback or to a rebuttal/response to the feedback.

From principles to practice

We have outlined here principles for providing, receiving and engaging with preprint feedback which we view as necessary to ensure a valuable and productive discourse for all parties. All those participating in this type of exchange hold responsibility for ensuring the interactions develop in a collegial and polite manner.

We recognize that guidelines exist for reviewers participating in journal review. Many publishers have developed their own reviewer guidelines, and there are also resources available by organizations such as the Committee on Publication Ethics (COPE (9)). As noted above, preprint feedback activities include additional actors and axes compared to journal peer review, in that any community member can participate in the process, there may not be third-party designated coordination of the exchange and it can take place fully in the open. With this in mind, we feel there is value in developing principles for what constitutes a productive exchange in the context of preprint feedback, applicable across the different formats and platforms in which this may take place.

We hope that different stakeholders will consider the FAST principles as they engage in their individual activities, and for organizations operating in this space, that the principles will provide a useful addition to their existing frameworks. We appreciate that some organizations will already have their own guidelines and/or policies for participation, and if that is the case, we would hope that they will explore areas of alignment between the FAST principles and their existing guidelines and moderation processes.

We are at a relatively early stage of development in public preprint feedback activities and stakeholders may opt to use the FAST principles in a variety of ways, including opportunities in the future which we cannot yet envision. We offer here a few ideas for how stakeholders may already apply the FAST principles to their activities.

Researchers

Many researchers engage in preprint-feedback activities. A number of groups and institutions run journal clubs that discuss the latest research papers, often including preprints. Some of these discussions take place locally at institutions, while other journal clubs operate online. For example, the OxMS Preprint Journal Club is a cross-institutional initiative by Mount Sinai and the University of Oxford which posts reviews on immunology preprints, providing a summary of the paper, any limitations, and context on the significance of the work (see an example [here](#)). We hope that journal clubs will incorporate the FAST principles, using them as a guide for the behaviors expected from their participants. The principles can be incorporated into any documentation for the journal club (e.g. onboarding materials, Code of Conduct information), and used as a reminder at the start of group discussions.

The FAST principles can also be implemented in peer-review courses. These are educational modules delivered at a number of institutions, as part of which students may be asked to review preprints. A couple of groups at the University of California San Francisco have implemented steps to post the reviews developed during their course ([Fraser lab](#)), and one of them lists the FAST principles as part of the course framework ([Mullins lab](#)). This type of peer-review courses can incorporate the FAST principles as a guide for the behaviors expected when appraising a preprint and posting the comments publicly.

Researchers, particularly early-career researchers, can also incorporate a section into their CVs listing preprint review activities, with links to the posted reviews and a reference to the fact they are FAST-compliant reviews.

Preprint servers

A number of preprint servers provide commenting options (e.g. via Hypothes.is, Disqus or purpose-built commenting tools on the platform). bioRxiv provides options to share feedback as a comment (example [here](#)) or to post reviews coordinated by designated groups via the Transparent Review in Preprints (TRiP) framework (see [here](#) for an example of a TRiP review). Preprint servers could use the FAST principles as part of the guidelines provided to those who contribute comments or reviews. A simple step would therefore be to mention and link to the FAST principles in the server's policy pages (e.g. [bioRxiv's FAQ](#) has a section about public comments). If the preprint server has a moderation mechanism in place for public comments, the evaluation of any concerns about posted feedback could also be done according to whether the comments deviate from the FAST principles.

Preprint-review platforms and preprint-review aggregators

The platforms that host comments on preprints (or more broadly scholarly work including preprints) may have documented expectations for their contributors. Similarly, overlay journals may have guidelines for their reviewers. Examples of existing guidelines include [Review Commons' guidelines for reviewers](#) and the [guide for reviewers provided by Peer Community In](#). These platforms and services can incorporate the FAST principles as the framework for expected behaviors within their policies or reviewer/contributor guidelines.

The PREreview platform encourages public feedback on preprints, which may be contributed individually or as a group (see [here](#) for an example of different reviews for a preprint on PREreview). PREreview also has a set of public resources around preprint review, including a [Code of Conduct](#) and a [Bias Reflection Guide](#), to help reviewers assess and make conscious their own biases and assumptions and mitigate how those may influence their feedback. Preprint-review platforms can incorporate the FAST principles into any such resources and link to examples of public feedback that embodies the principles. The platforms could also explore the development of templates to guide contributors in completing reviews that follow the FAST principles, or even tags or badges to designate FAST-compliant reviews.

In addition, preprint review aggregators such as Sciety or Early Evidence Base can implement the FAST principles as a framework for behaviors by communities and platforms from which they aggregate preprint feedback and reviews.

Journals

Many journals have guidelines for reviewers, either self developed or referring to materials provided by organizations such as COPE, EASE (European Association of Science Editors) or the Council of Science Editors. Many journals also accept or even encourage preprints, and some have also started initiatives to leverage comments posted on preprints (10,11).

Where do the FAST principles fit into the existing journal frameworks? The goal of a constructive and polite critique applies across both journal and preprint review, and thus many elements of the FAST principles overlap with journal review guidelines. It could be beneficial for journals to refer to the FAST principles in their guidelines for reviewers, and take this as an opportunity to re-evaluate their guidelines to see if there are

additional values and behaviours that should be considered and highlighted. We should bear in mind that there may be some differences, for example, the journal may ask the reviewer to comment on journal fit. Journals could expand the principles to have a Curation-FAST version, where the FAST principles apply to both preprint feedback and journal review, while any items related to curation and suitability of the manuscript for the journal are specific to the journal process.

As journal reviewers become more familiarized with the FAST principles, these would also feed into any comments they post on preprints. Inversely, FAST-complaint reviews on preprints brought into the journal process could also help build a constructive environment for journal reviews, resulting in benefits for the feedback culture both on preprints and journal submissions. For journals which operate reviewer metrics or evaluations, the FAST principles may provide an additional evaluation framework for the reviewers' work, beyond the timeliness of submitting the report.

When considering frameworks where journals may seek to bring preprint reviews into their editorial process, the FAST principles provide a guide for the necessary behaviours for any preprint feedback to be considered by the journal. In practical terms, this may require a mechanism to designate the preprints reviews as FAST-compliant before they reach the journal, and for the journal to trust the mechanism that issued this designation. A potential avenue may come from tags or badges for compliance with FAST principles issued by designated preprint-review communities whose processes and scope align to that of the journal.

For those journals that operate partnerships with preprint servers, the principles can provide a framework to consider future activities that involve not only the preprints but also feedback associated with the preprints. Review Commons and Peer Community In Registered Reports provide pioneering models where preprint reviews are reused by journals to avoid additional review cycles. It is likely that we will see further experimentation in this space, and the FAST principles can provide a tool for establishing suitable partnerships between journals and preprint review groups.

Journals can also allow and encourage authors to share, as part of the submission of their paper, earlier public feedback on the preprint along with comments on how the feedback has been incorporated (or not) into the manuscript sent to the journal. A number of journals already allow authors to provide copies of reviews received from other journals, and thus this would involve an expansion to the scope of such frameworks to incorporate comments on the preprint record of the paper.

Participating journals in the [Preprint Reviewer Recruitment Network](#) can also use the FAST principles during their evaluation of preprint reviews submitted to the network.

Funders and institutions

An important step toward recognition of preprint feedback as a scholarly activity in its own right would come from steps by institutions and funders to recognize preprint reviews as part of their assessment process. During hiring and promotion processes and in grant reviews, researchers could be prompted to provide information on their contributions to public feedback on preprints, and institutions and funders could use the FAST principles as the framework to designate preprint feedback suitable for evaluation.

Towards a thriving preprint feedback ecosystem

Broad endorsement of the FAST principles could support wider engagement with public preprint feedback, and bring benefits to researchers and the scientific process as a whole. Early-career researchers would have an additional avenue available to signal their academic contributions and skills, separate from their publication record. Researchers may embrace a more constructive approach to feedback, opening ways to receive more comments on their work earlier and develop collaborations. This can give rise to a culture where feedback is welcomed and encouraged as a way to foster conversations, as opposed to the current culture of competition and fear of retaliation.

Public preprint commentary can also be a way for researchers to broaden the impact and reach of their work: public feedback may contextualize and communicate the findings in a manner more accessible to non-experts and journalists, bringing new readers to the paper. In addition, preprint feedback provides an avenue to raise awareness about the scientific process within the general public. Researchers will write a manuscript, which gets read and critiqued by other researchers, before being revised and eventually published, generally at a journal. The public availability of preprint reviews provides a way to let this process play out in the open, allowing the general public to gain further understanding of how researchers scrutinize research findings and respond to feedback on their work, and thus presents a science outreach opportunity to help non-scientists better understand how the scientific process works.

Looking at the science communication system, the availability of public preprint feedback can allow journals to bring reviews into their review process, and help mitigate some of the known bottlenecks in finding reviewers for an increasing number of journal submissions. It may also make the journal peer review process more robust by allowing a more diverse and multidisciplinary set of views compared to the traditional journal process; as science becomes more inter- and multidisciplinary it is increasingly difficult to ensure that two reviewers will have the time and expertise to complete an evaluation of all aspects of a single manuscript.

At the same time, we acknowledge that several important challenges remain. A common theme in conversations with researchers relates to the lack of incentives for preprint review; the balance between benefits -unclear- and risks -very tangible in terms of potential repercussion or reputational damage- is still a major challenge. There are also concerns by preprint authors about the risk that reviews on the preprint may increase the manuscript revisions to undertake or the potential for editors to be reluctant to consider their paper if there is a critical public review on the preprint. We hope that the FAST principles will provide organizations such as journals and funders with a framework that supports new programs and initiatives that recognize and reward those who share their preprint feedback publicly, as well as the authors who engage with that public feedback on their preprint.

We should also recognize that while preprint review allows anyone to participate, a barrier to entry remains for non-native English speakers. Researchers for whom English is not their first language may feel less comfortable contributing public feedback in this language, and when they do, the comments may come across as less collegial or polite due to cultural differences or their level of language command. It is important for the community to be welcoming and respectful toward non-native speakers and as noted above, to proactively reflect on any biases that may influence perceptions toward comments by researchers for whom English is not their first language.

Turning to the possibility to bridge the gap between preprint review and journal review activities, there are also a number of remaining challenges. The experience from the COVID-19 Rapid Review cross-publisher initiative shows that editors may have reservations about using reviews posted on preprints (12), particularly if they do not know the identity of the reviewer. The FAST principles include an item related to the signing of reviews, but we leave that choice to the reviewer, as we recognize that some may not be comfortable sharing their names or may fear retaliation if they sign a critical review. While a mechanism to designate the public preprint review as FAST compliant may increase editors' trust, reservations may remain about using anonymous feedback, as editors may wish to verify the reviewer's expertise and any competing interests. Mechanisms that provide some verification of the reviewer's identity or expertise, for example, via a third-party endorsement or confidential sharing of the reviewers' ORCID may provide avenues to build trust, as well as recognition for contributions to preprint feedback.

An important aspect in the implementation of any framework relates to the responsibility for moderation and ensuring that expected behaviors are adhered to. In the journal review process, this responsibility lies with journal editors and publishers; in the preprint review space whose responsibility would it be to ensure that feedback is FAST compliant? There should be a collective responsibility in ensuring that interactions remain polite and constructive, but while this highlights the role that each of us plays in these interactions, it presents challenges at the time of implementation: to build trust that inappropriate behaviors will not be tolerated, it is important to have clarity as to who will act if there is a concern. The platforms hosting preprint feedback often have mechanisms to react to (and if necessary remove) inappropriate comments, and addressing concerns about deviations from the FAST principles could come within such frameworks. At the same time, it will be important for all to take a proactive stance in challenging feedback that we consider inappropriate, and as the preprint feedback ecosystem evolves, we may need to also develop new ways to flag and react to inappropriate behaviour, and to reward positive behaviour when engaging with preprints.

We share the FAST principles in the hope that they will be useful for the different actors in science communication as we pursue conversations around public feedback on preprints, and wish to be clear that we offer these principles as recommendations and not mandates. We hope that the different stakeholders will incorporate the principles into their existing activities and that they will provide feedback on what aspects need further development or adjustment, according to what they learn from using the principles. We welcome feedback from any individuals, groups and organizations that have an interest in the principles, or who have incorporated them into their activities, so that we can adapt or add to these in the future. We are still at a very early stage of preprint-feedback activities, and we anticipate that practices, culture and expectations will evolve as the activities grow and mature. We invite researchers and those involved in science communication to incorporate the FAST principles into their review activities, and to support their development as a framework toward the culture of preprint feedback we'd like to see.

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Summary of contributions

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