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Peer Review

Some say that democracy is not perfect, but it is the best system that we have. Some say that peer review is not perfect, but it is the best system our journals have. Is that so?

In Virgina Walbot's article "Are We Training Pit Bulls to Review Our Manuscripts?" this debate opens with the following question: "Who hasn't reacted with shock to a devastatingly negative review of a manuscript representing years of work by graduate students and postdoctoral fellows on a difficult, unsolved question?" [1]. Haven't you encountered pit bulls? Chances are … you have!

How does peer review work? There are three players in the game: an associate editor (AE), the author(s), and the reviewers. The reviewers are scholars and practitioners like you and me who are invited to review a paper. There are two fundamental assumptions that go into reviewer selection: one is that they are subject matter experts who can judge the quality of work, and the other is that they are fair minded in making their due judgment.

The former is easier to be identified, while the latter is not. Of course there are many good reviewers. However, after all, reviewers are human beings, not robots, performing the review task with common human feelings such as a sense of respect or camaraderie, and emotions such as jealousy or even hostility, all of which stem from relationships and past encounters. With such attachments and emotions intertwined with thought, the resulting review of course can be biased.

And there is a judge played by the AE whose job is to select reviewers and then make an informed but fair decision. Sound easy? The first challenge is to find some "good" people who will agree to do it, followed by pushing them to respond in time.

The next challenge for an AE is to sort through the reviews and come up with a decision that makes sense to all parties. This is the most difficult part of the job because every reviewer has a different opinion.

So who can be trusted with this tough job? To make things even more challenging, the tricky part of the process is that the reviewers are anonymous! Some argue that only with anonymity will a reviewer tell the truth. Others counterargue that anonymity not only erases names but also accountability. No one knows the identity of the reviewers except the AE! Will the AE hold the reviewer accountable for an unreasonable or unfair review? Unfortunately there isn't such a mechanism. In fact, often the AEs tend to side with the reviewers because they were invited by the AE to conduct the review in the first place.

The third member of the game is the author(s) who submit the work to be judged. Most of the authors believe their work is perfect, or at least that it deserves to be published. They will disagree if reviewers trash their work, especially when no compelling reasons and arguments are provided.

As a result, peer review has become a deadly love-hate triangle between the three players. We have pit bull reviewers hiding their bite behind anonymity, authors believing their superior works are being wrongly trashed, or the AE's decision being perceived as uninformed and unfair according to the available evidence. What's worse is that often there is no clear line in determining what is publishable. Then a dispute erupts…

The path to searching for the truth is never a straight line. Einstein first predicted that dark matter must exist, for he could not explain a flaw in his theory of relativity. Then he wrote a paper to recant that idea, followed by yet another paper to reinstate his original belief. How many would have such luxury under the peer-review system that we know today? Indeed, often one can find works of pioneering or nonconventional nature tend to face more resistance from reviewers.

A recent problem confronting AEs is a shortage of reviewers due to the explosion of paper submissions. An AE may have to invite more than a dozen reviewers in hopes of recruiting three. Such a widely cast net can be risky because who knows who will jump in, perhaps only friends or enemies.

How can we make the peer-review process better? Perhaps the key is the AE who plays the role of judge. The AEs are windows of our journals to the authors. Their decisions result in articles read by our readers. Their role is more important than many can appreciate. The worst we as a Society can do is to appoint unqualified AEs and let them experiment with the peer-review process. We have more than 1,000 AEs in the IEEE Signal Processing Society solely owned and joint journals. If we allowed each to operate independently, we would surely end up with some chaotic disputes.

To address the issues we are facing in peer review, a few years ago we started a systematic AE training at the International Conference on Acoustics, Speech, and Signal Processing (ICASSP) and the International Conference on Image Processing (ICIP). An AE must be highly qualified, senior enough with technical authority, firm-minded to make timely and informed judgment, and well connected to have a wide network of potential reviewers who can conduct a fair review. Therefore, qualified and trained AEs are essential to the success of the peer-review process.

So are you afraid of pit bulls? Peer review is perhaps the best system our journals can have, only if we do it right!

REFERENCE
[1] V. Walbot, "Are we training pit bulls to review our manuscripts?" *J. Biology*, vol. 8, no. 24, 2009.

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