Referees

Happy (belated) Peer Review Week! In case you missed it, September 19–25, 2016 marked the second-annual Peer Review Week [1] organized by a group of about 20 organizations, including ORCID [2], ScienceOpen [3], and Wiley. The objective of the event is to honor and celebrate peer review, with the goal of reinforcing the message that "good peer review, whatever shape and form it may take, is critical to scholarly communications" [1]. The theme for 2016 was "recognition for review," which investigated the principles behind peer review and how it is done in practice [4]. The year 2016 marks the second such event, with considerable growth since 2015, so look for it again in September 2017 for further insights and guidelines on the review process that should be of particular value for researchers. Expect to see pointers on how to review papers/proposals and also how to write papers that will review well.

Further insights on the role of referees in peer review are available from the editorial [5] and classic papers such as [6], which makes the key point that many reviewers never receive any formal training in the review process itself—instead they just learn it by practice. Even though it was published in 1990, the ideas in [6] are timeless, and the article provides an excellent resource for researchers new to the process and a good refresher for those that have a lot of experience. The article covers topics such as how to structure a review report and navigating the fine line between being too permissive (thereby possibly encouraging bad research) and too critical (thereby possibly blocking or unnecessarily delaying good research). The article also covers

- the need to provide strong justifications for any recommendations provided
- the need to point out flaws in the writing but avoid the urge to rewrite the paper for the authors
- the requirement of providing a deep assessment of the significance and correctness of the results.

To this list, I would add my own guidance, which is to write a review and then "sleep on it" and see how you feel about the paper and the comments in the review the next day. By adding that pause, I often find that the recommendations/justifications are improved by taking a second pass through, and I avoid submitting overly negative comments written on the "spur of the moment." The second observation is to remember that the authors of the article being reviewed are researchers just like yourself—how would you feel if you received the review you wrote if it had been for one of your papers? Finally, rather than just being negative about a paper, write the review to provide specific/implementable suggestions, such as pointing out related works that the manuscript should compare with or recommending particular simulations that should be done. In summary, try to be constructive and certainly do not be denigrating.

All of the IEEE Control Systems Society (CSS) associate editors and editors-in-chief greatly value the efforts of their many reviewers—it was recognition of your hard work that the Peer Review Week was set up to recognize. However, no discussion of the review process is complete without marveling at some of the hilarious/cringe-worthy comments that people submit in reviews [7], with some of my current favorites being "The paper

(From left) Randy Beard, Tim McLain, and Jonathan How take a break while biking up Provo Canyon Road in Utah.

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descends into nonsense, never to return, on line 44" and "an alternative to counting sheep," though I do not recommend using either of these!

Thinking about the review process reminds me of the Neural Information Processing Systems (NIPS) [8] experiment done in 2014 [9]. I have written about NIPS before; it is a well-respected conference in the machine-learning community that involves a very extensive double-blind process with a rebuttal phase (for a conference with 2400 attendees in 2104). To test the accuracy of the conference review and acceptance process, the organizers split the program committee into two parts, with about 10% of the submitted papers (166 out of about 1600) reviewed by both halves of the committee. To be fair, papers accepted by either committee were then accepted to the conference.

The final results indicate that the two committees disagreed on 43 of these 166 papers (that is, one committee accepted 21 papers that the other rejected, and 22 papers for the other). While 43 out of 166 does not seem too bad a of ratio, further analysis [10] indicates that, since the target acceptance rate for the committees was 22.5% (that is, 37–38 papers out of the 166), then the two committees actually disagreed on 21/37 (or 22/38) of the accepted papers, which is about 57%. Thus, "most papers accepted by one committee were rejected by the other, and vice versa" [10]. The results are surprising, and the implications are still being discussed, but, at a minimum, it sheds a lot of light on the apparent randomness of the review process, even for some of the better conferences in the field. With feedback like this, it is clear why the experiment was called "courageous" [10].

What is the equivalent level of confidence within the control community in the conference review process for the American Control Conference, the Conference on Decision and Control, and the Conference on Control Technology and Applications? It might be of interest to the organizers of these CSS conferences to try a similar experiment to collect data on the processes used in this field.

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Jonathan P. How

Decentralized Control Architectures in Nature

With a spider, what you see is pretty much what you get. A body's a body, a head's a head, and a leg's a leg. But starfish are very different. The starfish doesn't have a head. Its central body isn't even in charge. In fact, the major organs are replicated throughout each and every arm. If you cut the starfish in half, you'll be in for a surprise: the animal won't die, and pretty soon you'll have two starfish to deal with.

Get this: for the starfish to move, one of the arms must convince the other arms that it's a good idea to do so. The arm starts moving, and then—in a process that no one fully understands—the other arms cooperate and move as well. The brain doesn't "yea" or "nay" the decision. In truth, there isn't even a brain to declare a "yea" or "nay." The starfish doesn't have a brain. There is no central command.

—Ori Brafman and Rod A. Beckstrom, *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations,* p. 35, Portfolio Publishers, reprint edition 2008, ISBN: 978-1591841838.