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Reflections on Tutorials and Surveys

The summer is a quiet period for many of us, especially academics without regularly scheduled courses. Coupled with the complexities of traveling during COVID-19, many of us are spending more time at home and are trying to devote some time to more strategic thinking. Here I would like to share with you some thoughts about survey papers versus the tutorials currently found in *IEEE Signal Processing* Magazine (*SPM*).

I have explained in past editorials about special issues (SIs) [1] and feature articles [2]. While both categories focus on tutorials, the requirements are a bit different. An SI article is at most 20 pages, with 30 references and 10 figures (with subfigures counted as a figure), while a feature article is at most 40 pages, with 50 references and 15 figures (again with subfigures counted as a figure). The reason behind the difference in requirements is that an SI article appears in an issue with a number of other articles on the same topic. It is expected that SI articles are more focused compared with a stand-alone feature article.

The editor-in-chief (EIC) of *SPM* receives many questions, complaints, and criticisms related to the requirements for the magazine's articles. Sadly, at least in my case, the EIC rarely receives any praise for the content in the magazine by authors or readers. I think many complaints arise from the prevalence

of electronic publishing. Very few of us have actually opened a paper copy of the transactions recently. The idea of having a page limit seems unreal when there are only bits, not physical pages printed for most IEEE Members. *SPM* and other IEEE magazines are certainly an exception. They are still printed and optionally mailed to members who choose to receive a paper copy. The magazine has a certain optimal length for each issue around 130–180 pages, which is determined by aesthetics and the binding. Further, the page budget for the magazine is approved every year. The magazine is also prepared and formatted by a special team at IEEE, and articles are edited, figures may be enhanced, etc. In short, page limits are driven in part by the fact that the magazine is still printed on paper.

If *SPM* were only available electronically, would I support having unlimited pages? The answer is no. I believe strongly that page limits are essential in crafting a succinct message. The page limit is like the canvas size. By knowing the size, it is possible to adapt the detail in what you paint accordingly. As readers of *SPM* come from all backgrounds, a succinct message is often highly appreciated. Many readers see *SPM* as a relaxing diversion from reading more technical transactions articles. Of course, some readers also see *SPM* as a more technical departure from traditional magazines like *Wired*, which rarely have even one equation.

The limitations on references is another source of contention. The argument goes something like this: If my article is within the page limitations, why can't I include as many references as I want in the article? This is the situation in transactions, like *IEEE Transactions on Signal Processing* (*TSP*), for example, and is familiar to many authors. The main reason is that feature articles or SI articles are tutorials, not surveys. They are meant to introduce a topic and provide perspective. They are not intended to provide a detailed map of all related research contributions and how they relate. I view *SPM*'s audience as wanting to know the key five articles on this topic versus a survey that discusses 150 articles and how they relate. It is not to say that survey articles are not valuable to the field. But they do not fit well within the current structure of *SPM*.

What about figure limitations? This is trickier. Figures are quite useful as *SPM* articles usually explain concepts with as few equations as possible. Why have a limitation on figures? I do not know for sure. In general, I see the limitation as a forcing function to encourage the authors to explain the ideas in a terse way. But I can imagine many potential counterexamples to this. Another reason may be that figures require extra processing steps by the publishing team. However, I am not sure if a few extra figures would drastically change the budget. A final reason may

be that figures take more space, requiring a compromise between text length and number of figures, which is hard to do given all of the article processing steps for the magazine. It is easier for transactions where the authors essentially format their article. I think a new policy could be realized that allows for extra figures at the expense of some text.

Now back to surveys. If *SPM* is not the right venue, where can surveys on IEEE Signal Processing Society (SPS) topics be published? One approach is through the "overview article" mechanism [3], which is applicable for SPS publications like *TSP*. There are no reference limits, and the articles are generally expected to be more technical than an *SPM* article. There are still page limits though, requiring careful writing.

I would like to advocate for an alternative: create a new journal titled *IEEE Signal Processing Surveys and Tutorials*, which is shameless rephrasing of the *IEEE Communications Surveys & Tutorials* (*CST*). By the way, the most recent impact factor for *CST* was more than 20! *CST* has nicely defined the tutorial and survey categories. Quoting from [4],

A tutorial article in *IEEE Communications Surveys & Tutorials* should be designed to help the reader to become familiar with and learn something specific about a chosen topic. … Where appropriate, references for obtaining the background should be provided. The objective of citations in a tutorial should be to provide the reader with references where concepts can be studied more deeply, and these should be selected carefully rather than comprehensively.

and also

The term survey, as applied here, is defined to mean a survey of the literature. A survey article in *IEEE Communications Surveys & Tutorials* should provide a comprehensive review of developments in a selected area, covering its development from its inception to its current state and beyond, and illustrating its development though liberal citations from the literature. Such citations would naturally lead to an authoritative and comprehensive bibliography. The objective is to provide the reader with a sense of the history, development, and future of the topic area, including its interactions with other areas, and enough information to comprehend the development and identify the major players.

From these descriptions, it is clear to me that *SPM* is not equipped with the current requirements to serve the needs for surveys among SPS members. Consequently, I think there is room for a new publication in this area. At a minimum, it will give the *SPM* EIC a breather from further queries about reference limits.

References

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[2] R. W. Heath, "Making a good feature article submission [From the Editor]," *IEEE Signal Process. Mag.*, vol. 36, no. 5, pp. 3–4, Sept. 2019. doi: 10.1109/MSP.2019.2918010.

[3] "Publications FAQ," IEEE Signal Processing Society. [Online]. Available: https://signalprocessingsociety.org/publications-resources/publications-faq

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