

End-of-Year Summary

IEEE Control Systems Magazine (CSM) is doing well with, at the time of this writing in early August, about 35 feature, applications of control, and focus on education submissions in 2017, which is slightly higher than in 2016. The recent impact factor of 5.196 is significantly higher than the 2016 result (2.193). Furthermore, the recent high demand on publication volume has led to the approval of a further increase (about 7%) in the total page count for the magazine in 2017 (in addition to the 8% increase authorized in 2016). To provide a window into the ongoing events in the community, we have tried to maintain an average of two technical committee reports, two to three conference reports, and two to three “People in Control” interviews per issue in 2016–2017. Finding authors for those reports and working with them to edit the articles takes a considerable amount of time and effort, and I would like to thank Associate Editor Josh Isom and IEEE Control Systems Society (CSS) VP Technical Activities Anuradha Anaswamy for their considerable help accomplishing those tasks.

CSM has a very strong team of associate editors and editorial staff members, and I greatly appreciate all of their hard work. Recent departures from the team include Rajesh Rajamani, S. Joe Qin, and Antonio Loria, who have all been very helpful. In addition, Jeremy G. VanAntwerp is stepping down as the assistant editor. His efforts over the past five years in helping to improve the written content and working with Jason Harlow on “On the Lighter Side” and “Random Inputs” have been invaluable. He will be sorely missed. In 2017, we also welcomed three new associate edi-



Jonathan How standing in front of the racetrack used by the autonomous cars in the finals of the 2017 MIT Beaverworks Summer Institute (BWSI). Some of the other high school students attending the month-long BWSI built an autonomous unmanned aerial vehicle that had to navigate a three-dimensional obstacle course. (Image courtesy of Amelia R. How.)

tors, William Pasillas Lepine, Doris Saez Hueichapan, and Liu Hsu (introductions can be found in the “Publications Activities” column on page 13 in this issue). Finally, Nicki Washington has joined the team as a senior technical writer. Starting in 2018, CSM will include a new column, “Women in Engineering,” that Linda Bushnell is organizing. I am still looking for a volunteer to coordinate the writing of a “Student Chapter” column, so please e-mail me if you know of a good candidate for this position.

This past year saw the publication of the special issue “Game Theory,” and I would like to thank guest editors Carlos Ocampo-Martinez and Nicanor Quijano for their efforts in shepherd-

ing those articles through the system. A second special issue (in two parts), “Observers for Nonlinear Systems,” was also published in 2017, and I am indebted to Rajesh Rajamani for his help in organizing that one. A special issue on the control issues associated with an artificial pancreas is scheduled for publication in early 2018. A special issue on the control issues for assistive robotics is in the early stages of the review process. Note that special issues, and their accompanying introduction written by the guest editors, provide a unique opportunity to present a wide range of perspectives and results that can be of significant value to the community. More special issues are strongly encouraged, and I

would particularly welcome participation from researchers in industry. Those interested in organizing a special issue should e-mail me with their ideas and a proposed list of authors.

The CSM author's guide [1] and LaTeX style files [2] continue to evolve, so please be sure to use the current versions. Authors are strongly encouraged to review the provided materials to confirm that potential submissions are well suited for CSM and appropriately written/formatted.

Although I believe that CSM is doing well, recent feedback from several readers suggests that the tutorial content and accessibility of the articles needs to be improved. As such, the CSM author's guide has been modified to provide the following guidance:

IEEE Control Systems Magazine (CSM) articles are intended to inform the control engineering community of developments in specialized areas of control. Therefore, submissions must strive for high-quality exposition that explains the principal issues and challenges of their applications area. At least some of the introduction must be of a tutorial nature to introduce nonexperts to the area of application. CSM papers are intended to be expository, which means that they explain things to nonexperts, assuming knowledge of control and systems theory at the graduate level. The opening section of the article can review the relevant literature. A sidebar can be used to survey the relevant literature. Sidebars are encouraged for self-contained digressions and tutorials.

The authors are also encouraged to improve the tutorial nature of the article as much as possible. This includes providing a nontechnical sidebar (150–200 words) to serve as a summary. The intent is that this will be broadly accessible and improve the tutorial value of the paper/magazine. The summary should focus on the value/utility/impact



Jonathan How enjoying the scenery during a ferry across the harbor in Halifax, Nova Scotia, after giving an invited talk at the 23rd SIGKDD Conference on Knowledge Discovery and Data Mining.

of the result(s) and definitely avoid technical jargon.

The authors should also try to describe the contribution of the technology as clearly as possible in the initial section— why it's needed, gaps that it fills, where it might be used in industry, older methods it might replace, also what sort of mathematical background is needed, what computer code/resources are available (or alternatively, what programming you'd have to do to implement it).

For further guidance, consider the well-known CSM article “Bicycle Dynamics and Control: Adapted Bicycles for Education and Research” [3], which is a good model for feature content. The article contains photographs and clear/interesting illustrations; it has informative anecdotes and examples and emphasizes the ubiquity of problems in dynamics and control. Furthermore, [3] has only 27 equations in a 22-page article. The article “Control of Wind Turbines” [4] is another good example. It provides a strong motivation for the work, identifies the key challenges, presents a good discussion of the overall control framework and issues, and highlights the important future research directions.

As these two examples indicate, a good CSM article should provide a con-

cise statement of the overall problem, identify the important challenges in the area, present basic algorithms/solutions that are helpful for a novice in the field to understand the main issues, and discuss/assess the more advanced solutions that provide insights for experts. A good tutorial should also identify top papers in the field that provide further details on the results and algorithms and highlight the open technical issues that remain to be addressed. Tutorials could also provide access to additional resources, such as online software and data repositories. In summary, a good tutorial should provide nonexperts with the depth and breadth necessary to get started in a new area and experts with a means to stay current with recent developments.

In my experience, authors often try to put too many equations and theorems/lemmas into feature articles. That might be appropriate for technical journals, but is much less so for a magazine such as CSM. Authors should recognize that the members of the controls community have diverse backgrounds, interests, and familiarity with the advanced mathematical material. Since CSM is distributed to each CSS member, every effort should be made to ensure that at least some of each article is accessible, and of interest, to all.

The articles in this issue are the first to contain the new summary sidebars, and, as always, I welcome your feedback on this new content and/or other aspects of the articles that could be improved further.

REFERENCES

- [1] CSM author guide. (2016). [Online]. Available: http://ieeecss.org/sites/ieeecss.org/files/CSMAG_May2016.pdf
- [2] CSM latex style file and template. (2016). [Online]. Available: <http://ieeecss.org/sites/ieeecss.org/files/CSMLatex.zip>
- [3] K. J. Astrom, R. E. Klein, and A. Lennartsson, “Bicycle dynamics and control: Adapted bicycles for education and research,” *IEEE Control Syst.*, vol. 25, no. 4, pp. 26–47, Aug. 2005.
- [4] L. Y. Pao and K. E. Johnson, “Control of wind turbines,” *IEEE Control Syst.*, vol. 31, no. 2, pp. 44–62, Apr. 2011.

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