

## The First Year as EIC

**T**ime flies when you are having fun” doesn’t exactly apply to the job of being editor-in-chief (EIC) for *IEEE Control Systems Magazine* (CSM), but my first year in this role has certainly flown by very quickly.

The latest news has the magazine in good shape, with, at the time of this writing (in September), over 54 feature, “Applications of Control,” and “Focus on Education” submissions in the past 11 months, of which approximately 15% have been accepted and a further 45% are still under review. There is at least one special issue being processed and another one being formed, both of which are on very exciting topics that will be of high interest to many CSM readers. The latest impact factor results (2.088) are lower than 2014 (3.386), but these values appear to fluctuate, and the five-year impact factor remains a strong 3.516, according to *Thomson Reuters 2014 Journal Citation Reports—Science Edition*. CSM has a strong team of associate editors and editorial staff, and the former EICs (Dennis Bernstein and Richard Braatz) provide excellent support and feedback.

Although CSM is in good shape, there is always room for improvement, so I have following suggestions and requests.

Of course, CSM is always looking for excellent articles. As you know, the magazine publishes tutorial, expository, and/or educational articles that provide technical depth but are designed to be accessible to the whole control field. As such, CSM provides

an ideal opportunity for a researcher (or even better, a group of researchers) who has already written several technical conference and journal articles on a topic to “take a step back” and provide a broader view of the overall challenges associated with an area, discuss and assess the available solutions, and then highlight the technical issues that remain. This opportunity is further enhanced by the fact that all of the magazine articles are in color and have essentially no page limit.

Note that a CSM article does not need to contain new technical innovations. It could, for example, provide broader context for the state of the art, identifying the relative merits and issues of solutions that exist. A technical survey of the literature

in a particular area can also be published as an article, provided that it goes beyond just listing papers and gives insights about the various techniques and/or a critique of the field. Regardless of the format, CSM articles should

- » be written in an accessible and tutorial manner
- » make it clear what is exciting about the topic
- » identify top papers in the field that the readers could review for more information
- » educate the readers on the open questions that remain.

“Applications of Control” articles from colleagues in industry or academia that can help identify and close the theory/practice gaps are



Relaxing after an *IEEE Control Systems Magazine* editorial meeting at the 2015 American Control Conference (from left): Behçet Açıkmeşe, Marco Pavone, EIC Jonathan How, Antonio Loría, Rolf Findeisen, Antonella Ferrara, Hong Yue, Jeremy VanAntwerp, and Jorge Cortes).

of particular interest. Reference [1] discusses the existence of this gap between theory and practice and highlights several ways that the academic community might contribute to bridging the gap. I hear anecdotally that this gap has become even larger than when [1] was published in 1999. For example, there is a need to provide software verification and validation for complex systems such as the F-35, which has over 24 million lines of code and operates in a complicated, dynamic, stochastic environment.

As another example, engineers in the aerospace industry are implementing state-dependent, gain-scheduled (smooth linearly interpolated between the design points) controllers that achieve stable operations throughout large flight envelopes and provide significantly better performance than can be guaranteed theoretically. These are just a few of many possible examples (see [4]), but they indicate that there could be significant value to the IEEE Control Systems Society (CSS) community from articles that can clearly state some of the core technical basic research challenges that must be addressed to begin to solve these real-world problems. Bridging, or at least closing, the gap is important to ensure that the control theory being developed remains relevant but is difficult for researchers to achieve when they are not sure where to start and what are the most important challenges to address. Thus, articles from teams of academics and industrial partners that clearly explain the issues associated with a particular theory-practice gap would be particularly attractive and provide an important service to the community.

Special issues of *CSM* provide an opportunity to present several perspectives and solutions at the same time, which is typically even more insightful for the readers. Special issues typically address large-scale topics of broad appeal, with recent examples including the unmanned aerial vehicles issue in October 2012, the micro- and nanosystems issue in December

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2013, and the cyberphysical security issue in February 2015. Special issue proposals are strongly encouraged, especially on topics such as using control techniques to improve medical treatment and health care, control topics related to systems biology, analysis and performance assessment of nonlinear and adaptive systems, and software verification and certification.

“Focus on Education” articles that provide insights on teaching best practices for control-related materials,



EIC Jonathan How preparing for a charity bike ride in August 2015.

both in the classroom and online, are also encouraged. Of particular interest are perspectives on new, or better, ways to modularize course materials or special ways of teaching specific material that have been developed. In-class and laboratory experiments provide an excellent way to drive home the control theory, so articles could also be written on the latest ideas for a low-cost, high-impact testbed designs for both undergraduate and graduate classes.

*CSM* book reviews provide an important service of analyzing the recent literature and giving insights on the particular merits of the various books available. I enjoy reading these and have purchased several books based on an interesting review. We have recently committed to increasing

the number of book reviews that are published and thus are looking for new book reviewers. Please contact me, Scott Ploen, Hong Yue, or Hesuan Hu if you are interested. Reviewers receive a free copy of the book and are rewarded with their picture in the “About this Issue” column!

Most importantly, *CSM* is the magazine for the CSS community, so one of my goals is to increase its use as a mechanism to raise awareness of all the activities that are going on in the control field through the “Publications” and “Member Activities” columns. This includes more discussions of the work being done by the technical committees and more reports from the various conferences and workshops that are supported or technically cosponsored by the CSS (see [5]). Thus, if readers are aware of control-related events, workshops, news, or technical committee meetings that you think others would be interested in, then please e-mail me the information (jhow@mit.edu).

I look forward to your submissions in areas listed above and hope that 2016 will be as interesting as 2015.

## REFERENCES

- [1] D. S. Bernstein, “On bridging the theory/practice gap,” *IEEE Control Syst.*, vol. 19, no. 6, pp. 64–70, Dec. 1999.
- [2] R. Braatz, “Call for special issues,” *IEEE Control Syst.*, vol. 34, no. 6, p. 22, Dec. 2014.
- [3] (2015, Aug. 5). F-35 program continues to struggle with software. [Online]. Available: <http://spectrum.ieee.org/riskfactor/aerospace/military/f35-program-continues-to-struggle-with-software>
- [4] T. Samad and A. Annaswamy. (2015, Aug.). The impact of control technology, 2nd ed. [Online]. Available: <http://ieeecss.org/general/IoCT2-report>
- [5] (2015, Aug.). CSS conferences [Online]. Available: <http://ieeecss.org/conferences/css-conferences>

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