

About This Issue

I'm sure that you've seen those videos with the film running backwards, where a vase that is broken into thousands of pieces reconstitutes itself perfectly, with every little fragment falling exactly into place. That reverse video is a pretty good metaphor for the process of putting together an issue of *IEEE Control Systems Magazine (CSM)*. During the two critical months before an issue is assembled, authors

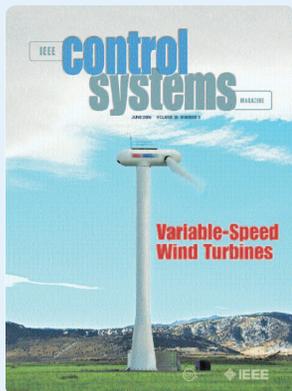
scattered around the world are working simultaneously on their contributions in anticipation of the publishing deadline. At that early stage, the final product is at best a fuzzy concept, somewhat like a jigsaw puzzle with rough pieces scattered all around a room. But, as the deadline approaches, each piece comes into focus, and the overall picture assembles itself—with the help of a dedicated IEEE staff—into a coherent whole, namely, the issue you're holding.

The process of putting together an issue of *IEEE CSM* consisting of contributed articles is especially exciting. Whereas a special issue reflects an overarching vision that links the feature articles, a contributed issue is more like a smorgasbord with unplanned dishes. You never know what you're going to eat next.

For appetizers, the "Applications of Control" column features two delicacies, namely, an automated chicken-processing system (no intentional pun here) and the story of CalTech's Alice, a self-driving van that competed in the 2005 DARPA Grand Challenge. Next, we have the "People in Control" column, which features an academic leader from Mexico as well as an industrial leader from the United States.

Now for the entrees. The first main course for this issue, by Güvenç and Kural, describes a multiple-driver-in-the-loop testbed for simulating and testing adaptive cruise control algorithms. The software, which uses MATLAB's Stateflow for mode switching, allows drivers to experience a variety of scenarios. Next we have the article by Stubbs, Vladimerou, Fulford, King, Strick, and Dullerud, which describes the development of a testbed for networked vehicles in the form of hovercraft. The testbed is designed to enable Internet access, making it usable remotely.

We then turn to the cover article on control of wind turbines by Johnson, Pao, Balas, and Fingersh. In this article, the authors analyze the stability and performance of an adaptive algorithm for variable-speed turbines, designed to eke maximal energy out of the passing air flow. This article is especially exciting given the increasing investment in wind power installations and the economic value of an improvement of even a few percent.



Next we turn to a mechatronic application in which Owen, Maggiore, and Apkarian develop and validate models and controllers for an iron-core precision stage. These devices are used in semiconductor processing and other applications that require extremely accurate motion.

Finally, Bristow, Tharayil, and Alleyne provide a self-contained tutorial on iterative feedback tuning (IFT), a control method directed at tasks that are performed multiple times. The tutorial, which shows that researchers have developed IFT into a truly promising technology, outlines directions for future research.

If these articles have not left you overly full, you might have just enough room for what follows. An interlude on one of the lesser known pioneers of control is given next by the "Historical Perspectives" column contributed by Bissell. Be sure to read this article to find out what the "Barkhausen criterion" is.

Next we turn to the book reviews. The first two books are aircraft oriented, one on micro air vehicles and the other a textbook on flight mechanics. The former topic is timely, while the latter is a subject in great need of modernized texts. The third book is concerned with fault detection, a timeless topic of importance in control engineering. Finally, the last book provides a system-theoretic approach to thermodynamics, a large-scale system theory that has long been overdue for a rigorous foundation.

Finally, we bring you two conference reports. The first report describes the outstanding joint IEEE Conference on Decision and Control and European Control Conference (CDC/EEC) held in December 2005 in Seville, Spain. The conference brought together so many excellent speakers and ideas that the event left this attendee hoping to see a future repeat performance. Finally, a report from an inaugural conference held in Harbin, China, in January 2006 describes a warm gathering in a memorably cold place.

With this issue we reach the midpoint of 2006. But the year is still half empty, and there is much to come. At least two special issues are in progress and these will—as usual—be exciting and educational.

Let me close with two invitations. First, if you're interested in organizing a special issue, do not hesitate to contact me. A special issue provides a unique opportunity to capture an area of control technology. It usually takes two years to see a special issue appear in print from the day of conception. Better to start soon!

Finally, I'm always looking for tutorials that explain new or classical ideas that are essential to systems and control. At the CDC, I spoke to several attendees who expressed an interest in writing such tutorials. *IEEE CSM* is the perfect venue for such articles, with full color, never any page charges, and long manuscripts allowed. Please contact me with your ideas.

See you in August.

—DSB