Hilbert and Dilbert

Most of us are well aware of the fact that engineers get far too little recognition for what the profession accomplishes. The work of medical doctors, lawyers, and architects is either widely publicized or clearly visible. Sure, a bridge or building is largely the product of engineering, but if you watch an edifice being constructed, I doubt you'll see a single engineer on site. Small wonder that the public hasn't much idea what engineers do. Even physicists and mathematicians publish countless books explaining the process behind their work. My kids know a lot more about missing matter and the Goldbach conjecture than they do about motors and amplifiers. Petrovski aside, the engineering profession fails miserably at communicating what it does.

Yet we live in a world of engineered products and systems. And I do not use the word "engineered" lightly. Something is engineered when it is created by *engineering analysis*, a process that combines empirical experience and ingenuity with reasoned mathematics, physics, computation, and testing.

Engineering is a process that is almost never seen by the public. This process often occurs in the cubicles of the comic page where engineers design and analyze on paper and computer, producing the designs that are eventually implemented. While the unfortunate and highly visible cases of engineering failure give rare publicity to the profession, the process remains vastly hidden and inscrutable to the public at large. Engineering simply isn't as sexy as black holes, and its accomplishments are usually taken for granted. The remarkable devices for sale at Best Buy emerge on

Contributors


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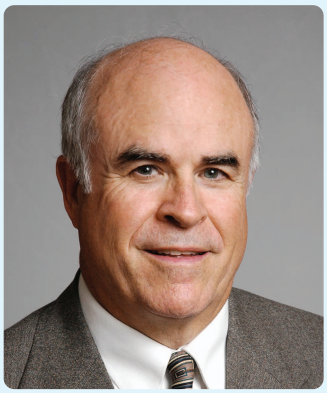
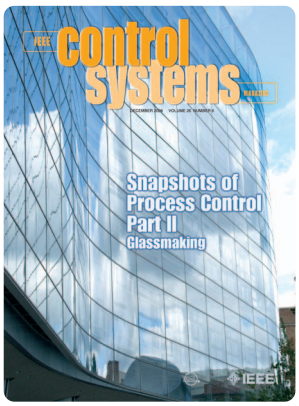

Thomas Edgar

cue from the anonymity of the bullpen.

You might suspect that my views on this issue grew of out a combination of my experiences in a government laboratory, industry, and academia. Not really. Rather, I once planned to purchase a sophisticated piece of equipment, and I tried to obtain certain specifications for the device. However, those selling the device had little idea how it worked, while the designer was not to be found. A vanished engineer is a vanished process, leaving everyone in a state of ignorance.



Like the August 2006 issue of the *IEEE Control Systems Magazine*, this issue is devoted to hidden things, specifically, the processes that make the things we take for granted and are rarely explained publicly. While the August issue focused on biological processes, the current issue involves both biological and nonbiological materials. The topics that this issue covers range from petroleum refining and emerging fuels to glass, lithography, chemicals, and concrete. Like the August issue, Wayne Bequette serves as guest editor of the special section. Thanks, Wayne!

In this issue we also bring you the usual columns. You'll find "25 Years Ago," which remembers Nathaniel Nichols, the originator of the Nichols chart and past associate editor for history, courtesy of Kent Lundberg, current associate editor for history. We have letters responding to my "Digital Divide" editorial in the August issue. (Feel free to comment on that or any other past or future editorial!) In "Applications of Control," we have a research report on the analysis of the human ability to maintain balance by identifying PID gains. "People in Control" brings you three interviews with members of our field doing lots of interesting things that you might not have heard about but will be glad you did when you read the column. We have four interesting and thoughtful book reviews on four interesting and thoughtful books. In "Conference Reports," we venture to China. Be sure to read about these events as you make your plans for CDC 2009 in China. John Baillieul reports on his trip to scout out a venue. And we remember Karen Yin. We close with more elevator control systems, inspired by the numerous elevator trips we all make at CDCs and ACCs in high-rise hotels. All ideas are made freely available to lift manufacturers.

Since we now reach the end of 2006, I wish to thank the *IEEE Control Systems Magazine* Editorial Board for all of their hard work, all of the authors who have contributed to the magazine during the past year, and the reviewers of articles who remain anonymous but deserve our appreciation.

We all thank and bid semifarewell to John Baillieul as he moves on to IEEE Control Systems Society (CSS) past-president status, and we welcome Ted Djaferis who assumes the mantle of CSS president. He has 40 large pairs of shoes to fill.

To tell you what is in store for 2007 would take another lengthy column. Suffice it to say that you will not be disappointed by the classical control revisited issue or the special sections on control of complex networks. We have special tutorial papers in the works on a broad range of modeling topics, and our 50th anniversary Kalman filter issues are now officially under development. Please contact me if you wish to contribute in any way. We're always looking for short applications articles. Oh, and don't forget to renew your CSS membership. You can't pick up this magazine at any newsstand. Happy 2007!

Dennis S. Bernstein
Editor-in-Chief
IEEE Control Systems Magazine