Yes, I'm an EE

Control engineers in general, and IEEE Control Systems Society (CSS) members in particular, come from all areas of engineering. My "local home" is an aerospace engineering department and, while I've flirted with ASME, SIAM, and AIAA over the years, I've always felt most comfortable in the CSS. I'm sure that many of you feel likewise about our globally and technically inclusive Society.

Once in a while, someone asks me whether I'm an electrical engineer. After all, the IEEE is an electrical engineering society (with an "E" to spare). Although I could analyze a simple circuit or explain how an antenna works if I absolutely had to, I would never count myself as an electrical engineer. Fortunately, proficiency with Kirchoff's laws and Maxwell's equations is not a prerequisite for membership in the IEEE or the CSS.

On the other hand, there are two special features of control engineering that are unique to our narrow-but-universal engineering specialty. Systems, especially feedback systems, often involve the analysis of subsystems that come together to form larger systems. While we concern ourselves with the technological details of the subsystems—motors, amplifiers, and data links—our special role as control system analysts is modeling the behavior of the overall system. The ability to analyze what emerges from the interaction of these components is our forte.

The other special feature of control system analysis is the careful and deliberate distinction we make between what we know and what we don't know. When I see an equation with several parameters, I immediately wonder which ones I can determine and how well I can determine them. In short, "What do we know, and how well do we know it?"

More generally, control system engineers are taught to go beyond the physics and math by taking into account a combination of modeling and data. This unique operational view is built into our culture since we can't implement a controller or determine the response of a model based on information we don't have.

In philosophical terms, there are those who want to understand the reality of the world, and I would guess that most physicists and some engineers fit that description. As control engineers, we need to understand the physics, but we think of technology in terms of what we know and what we can accomplish with what we know. This world view is called epistemological.

Control engineering is unique in its combined emphasis on emergence and epistemology—how systems combine and what we know about them. This pair of "E"s captures what we do and how we do it. These dual themes bring us together from diverse fields to form the IEEE CSS.

So, when you tell someone that you're a member of the IEEE CSS, and they ask you if you're an electrical engineer, you can tell them without hesitation, "Yes, I'm definitely an EE."

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

Dennis Bernstein gets a good view of the world's longest cable-stayed bridge from the campus of the University of Patras, Greece. The Rion-Antirion bridge, completed in 2004, links Peloponnese (southern Greece) to the Greek mainland.

The editor-in-chief visits with Vincent Blondel (left) and Michel Gevers (right) during a recent visit to Université Catholique de Louvain in Belgium.