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Will ABET Survive to the Year 2032?

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I first came across accreditation and ABET in the early 80s – about two months after I was hired as an assistant professor in an Electrical and Computer Engineering (ECE) academic department. One of the sophomore students I advised (he has since graduated and founded a very successful multimedia electronics company) came to see me with an unconventional plan of study. The young man wanted to receive a degree in ECE, but also include in his curriculum elements of Chemical and Materials Engineering at the expense of some ECE favorites. Moreover, he wanted to take several course sequences in Operations Research, Business, and Economics. These were not on the list of "approved courses" in our undergraduate curriculum brochure.

The assistant department head for undergraduate education, with whom I met to discuss this plan, was compassionately dismissive. This was not the first time he met young professors who knew next to nothing about the way the academic system works. Patiently and in a fatherly manner he explained to me the facts of life. Among these facts was the overarching presence of ABET (then still called the Accreditation Board for Engineering and Technology), an organization founded in 1932. In my older colleague's world, ABET was indistinguishable from a powerful force of Nature, a looming power that makes its own rules, and forces all others to follow these rules obediently and unquestionably. "ABET will not approve that" he uttered almost every time I tried to make an argument. He quoted from memory specific ABET criteria and regulations, and had a cache of "ABET did not approve that" horror stories. At times he almost sounded as an installed agent of ABET rather than an employee of our school. In his world, and to large extent later in mine as well, ABET was a limiting factor – a body that stops us from innovating and experimenting, a foreign police force, more an obstacle that we have to overcome or outsmart than a partner for enhancing the quality of our educational programs.

Before I left the office of the assistant department head, utterly defeated, he could not resist one last comment, perhaps to soften the blow. It feels constraining," he said, "but ABET's dominance over engineering accreditation is a little bit like the dominance of the Bell system over telephone services. It poses some limitations, but everybody knows it is good for all of us." At the time we spoke, I know now, the Bell system was four years away from a final breakup.

In fairness to ABET, the limits that its criteria have imposed on accredited programs always allowed some flexibility. My then-colleague may have been ignorant of the variation opportunities that ABET criteria provided, or was unwilling to explore them. In time, I developed a much more informed and balanced view of ABET, a federation of about 30 professional associations dedicated to accreditation of academic programs in applied science, computing, engineering, and technology. While not a very large organization in terms of budget (less than 6 million dollars in annual revenues) or staff (less than 50), ABET provides a highly formalized service of quality review, control, and assurance through a well-documented series of plans, criteria, guidelines and practices. IEEE participates in ABET's activities both directly (as a member society) and indirectly (as member of another member society, CSAB). Every year, we send and support close to 400 volunteers who serve as program evaluators for ABET and as members of ABET's governance bodies. We pay "maintenance fees" to ABET and cover the ABET-related expenses of many of our volunteers. The work of these volunteers and the support of the engineering associations provide ABET with an unusual strength. ABET taps the power and enthusiasm of thousands of unpaid professionals from academia, industry and government, individuals who care about the quality of academic programs in engineering, to perform program review and administrative work that would have otherwise been very expensive if not infeasible. The volume and quality of this work have made ABET, a US-based organization dedicated to accreditation of US institutions, the gold standard in engineering education in many other countries.

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Non-US accrediting bodies have often adopted ABET's accreditation philosophy and practices, and the "essential equivalence" visits that ABET conducts to some non-US schools have often provided such schools with better appeal and prestige than the credentials they were provided by any local accrediting body. While ABET is no longer recognized by the US Department of Education (as of 2001), graduation from an ABET accredited program is still the basic credential that individuals must possess in order to take the examinations leading to professional registration in engineering in most US jurisdictions.

So here is the basic picture. We have built a powerful organization in the United States dedicated to engineering accreditation, and run by professional associations. It accredits more than 2500 programs using published program criteria and strict review guidelines. The organization is respected and revered; in the mind of many it contributed to the high standing of American engineering education worldwide. Its stamp of approval is meaningful and widely recognized. Thousands of volunteers work for it.

And yet there are a few visible flaws in this picture that require our attention.

1. ABET is a monopoly. In spite of the "voluntary" nature of ABET accreditation, it is very hard for an engineering program to forego ABET accreditation, even if the school is at odds with ABET on philosophy, criteria, procedures, goals, or costs. Bodies that run a monopoly (like old Ma Bell) almost always believe that they provide the best service at the best price, and that opening the field to competition will be bad for humankind. Experience shows, to the contrary, that breakup of "essential" monopolies often leads to large improvements – both in service and in cost. The mere existence of an alternative to ABET may be a positive development in itself.

   Institutions and programs that do not adhere to the current philosophy of ABET, or those who seek a more consultative and less regimented review (such as review by peer institutions) have nowhere to turn. Institutions that want to accredit both a Bachelor of Science and Master of Science programs in the same field cannot do so either (for reasons that no one appears to be able to articulate, ABET would not agree to perform accreditation visits to both programs). It is "ABET or nothing."

   The availability of more than one accrediting body for engineering in the United States is likely to offer alternative accreditation models, put pressure on inexplicable and obsolete ABET procedures, encourage openness, and provide the field of engineering accreditation with a measure of competition that we lack at the present time.
2. ABET's governance structure leaves two key constituencies, Academia and Industry, underrepresented. Neither Academia nor Industry have formal representation on ABET's Board of Directors and their voices are heard only indirectly and unofficially (through members of the Board who tend to come from these sectors). Academic institutions did appear to affect some of ABET's key decisions in the past (most notably, the development of EC2000) but their influence on decision making in ABET continues to be indirect. Industry, whose interest in credentials and qualification of engineers and scientists is supposedly paramount, is also formally uninvolved; it has no voice on the Board, and, not surprisingly, it provides little financial support to the organization.

   Several non-US accrediting bodies developed different approaches. Half of the members of the French Commission for Accreditation in Engineering (CTI) come from higher education and the remaining half represent the various aspects of the profession. The Japan Accreditation Board for Engineering Education (JABEE) has 55 corporation and industrial organizations, such as Canon, Fujistu,

Nippon, and Toshiba, who are "supporting members". These industrial members provide the organization with advice (through an Industry Advisory Council) and substantial financial support.

3. The ABET governance model may not be sustainable in the long run. ABET's income depends critically on fees levied on not-for-profit engineering associations whose dues paying membership in the United States has been decreasing for several years. The bulk of the evaluation work done by ABET is executed through US volunteers, and the availability of these volunteers, especially from industry and government, has been (and is likely to continue to be) on the decline. ABET fees – both those imposed on schools and on engineering associations – have been increasing in the last decade at a rate that exceeded on average the Consumer Price Index in the United States (in some years by a factor of more than two (2)). It appears that without new funding sources from government or industry, the current financial model of ABET may become a serious limitation. It may also be the case that without a formal stake for Industry in the organization, the ever increasing efforts to involve volunteers from Industry in ABET program evaluation will have only diminished yield.
4. The current nation-by-nation accreditation models, including ABET's, are slow to respond to globalizing market forces. With the increasing fluidity of engineering work and jobs, accreditation (and registration) models which stop at the state or country borders are unlikely to remain useful. The steps taken so far by existing accreditation bodies to address globalization (such as the Washington Accord) are small and rather unimaginative. The US centric approach of ABET is similarly non responsive to globalization trends. Continued failure to address globalization may lead to the marginalization of the U.S. engineering accreditation system (much like the now largely irrelevant US engineering registration system.)

Effective accreditation of engineering programs in the future will have to recognize the global nature of the profession. The global environment will have to inform the design of the accreditation process – not be an afterthought, to be patched over by after-the-fact mutual recognition agreements. A design for accreditation in an environment that requires continuous cooperation across borders would require intensive and even-handed collaboration between practitioners and educators from many countries. It will not be possible any more to make all important decisions in Baltimore, Chicago, and Los Angeles.

It is not easy to predict whether the challenges that ABET (and the engineering accreditation enterprise in the United States) face would lead to the emergence of new accrediting bodies in engineering or to the retooling and reinvention of the existing organization. It is quite clear, however, that the current course of ABET is unlikely to be sustainable in the long haul, namely (1) ABET's absolute monopoly on engineering education accreditation in the United States; (2) ABET's existence as a powerful but small organization, dominated and economically dependent on somewhat stagnant engineering associations; (3) ABET's continued detachment from industry and the indirect role of academia in its decision making; (4) ABET's increased focus on "law enforcement" and rule uniformity in a business climate that is ever-more varied, flexible, and heterogeneous; and (5) ABET's US-centric view of the engineering accreditation enterprise in a climate that calls for strong cooperation across borders. Whether by design or by the forces of competition, ABET at its centennial of 2032 will have to be a much more open, global, heterogeneous, elastic, and participatory organization than it is today. It is our duty to bring it there.

From the IEEE Committee on Technology Accreditation Activities

The Quiet Crisis

John J. Sammarco, Ph.D., P.E., Chair,
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"China will graduate a million engineers a year." That was the headline of an article I was reading on a recent flight. Yes, China is projected to graduate a million engineers a year and could possibility reach that figure this year. India is also graduating an astonishing number people with engineer and engineering technology degrees; about 350,000 engineering degrees for 2005. Where is the United States?

It is estimated that the U.S. will graduate about 350,000 engineers. I have not seen estimates for those with engineering technology degrees but I believe the numbers to be even less. All these numbers are estimates; let us look at some "hard" numbers. The National Science Foundation published a study in 2000 that indicated China had awarded 219,563 engineering degrees or about 39% of all "first university degrees". Japan had 104,478 engineering degrees or about 19%. The U.S. had 59,536 engineering degrees or just 4.7%. What is happening?

There is a "Quiet Crisis" for engineering and engineering technology in the U.S. as described by **Shirley Ann Jackson**, President of Rensselaer Polytechnic Institution. She writes in

her January 25, 2006 letter to President **George W. Bush**, "Mr. President, our science and technology position is a looming national crisis because it robs us of our capacity for innovation—so critical for our economic and national security." This crisis is also described in **Thomas Friedman's** bestseller book "*The World is Flat*". Why is there a crisis?

There are many reasons given for this crisis. Is it that there are not many employment opportunities? I don't believe that to be true; but, there is a perception that jobs will become scarcer as jobs are outsourced to Asia. In fact, data from the U.S. Bureau of Labor Statistics indicate that electrical and electronic engineering technician employment has experienced substantial growth of about 167% from 1983 to 2002; electrical and electronic engineering occupations grew about 150% during this period. I do believe that one reason for the crisis is that students are not interested in engineering or engineering technology careers because parents, teachers, and guidance counselors do not encourage these career paths. Most adults don't even know what engineers do - this is about 60% of U.S. adults according to statistics from Trilogy Publications LLC. Adding to this situation are negative images of engineers and engineering technologists as "geeks" who were subjected to some of the most demanding curricula in education. Yes, there are many reasons for the crisis, but, what can be done?

This crisis has not gone unnoticed by the IEEE and ASEE. The IEEE Board of Directors has a new initiative "Launching our Children's Path to Engineering". ASEE is running an engineering K-12 center. At the national level, the Quiet Crisis message is getting to the top level of government. At the state level, the Texas Engineering and Technical Consortium (http://tetc.engr.smu.edu/mission.html) was formed. At the personal level, each of us in the IEEE and ASEE can talk to our sons and daughters about technical careers and help educate people about engineering and engineering technology _ educate them about who we are, what we do, and how we contribute to our nation's economy and security.

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From the President of the IEEE Education Society

Globalization, Education, Organization

Dan Litynski
President, IEEE Education Society

Globalization is inescapable. The transformation of economies and partnerships around the world over the past two decades has profoundly affected the role and wealth of nations and the professional practice of many organizations and individuals. Every conference discusses how to cope with it. Books and studies describe its effects. After accepting that "*The World is Flat*"[1], we are guided in how to ensure that we are "*Rising Above the Gathering Storm*"[2]. Success is said to depend on competitive advantage in science and engineering, including the systems that support it such as education.

What is the role of government, industry, and academia in this new global order? Leaders worldwide are responding to the call. In the United States, President **George W. Bush** in his recent *State of the Union* address[3] called for a renewed emphasis on science and engineering. The FY 2007 budget[4] proposes an *American Competitiveness Initiative* (ACI). Legislation[5] has been introduced that would implement some of these and other proposals. If implemented, they will reinvigorate Science, Technology, Engineering, and Mathematics (STEM) by significant increases in funding for education and research.

Engineering is a global activity and our professional societies are heavily involved in many transnational activities. The IEEE Vision is to advance global prosperity by: 1) fostering technological innovation, 2) enabling members' careers, and 3) promoting community worldwide. The IEEE included 367,395 members at the end of 2005; approximately 60% are in regions 1-6 (within US) and 40% are in regions 7-10 and come from over 150 other countries worldwide. At the triannual IEEE Series Meeting in February 2006, IEEE President **Michael Lightner** discussed several international efforts. He proposed an alternate vision: IEEE enables technical professionals to distinguish themselves in a globally competitive environment. He noted that the IEEE online packages are globally popular with over 1,500 customers and 2,280 sites worldwide, and also mentioned the work of the IEEE, IEEE Foundation, and Hewlett-Packard Corporation in support of a new computer lab at Nigeria University.

The IEEE Education Society is globally engaged. Our vision is to be a global leader in educational innovation, pedagogy, and research. Fifty three percent (53%) of our 3,250 members live in regions 7-10; we were one of the few societies to grow in membership this past year and much of that came from those regions. We meet regularly with counterparts in other organizations from several countries. Our premier *Frontiers in Education Conference* focused on *Pedagogies and Technologies for the Emerging Global Economy* in 2005 and in 2006 will highlight issues related to how education can identify and surmount international, cultural, and social borders. The American Society for Engineering Education (ASEE) invited

us to attend the Australasian Association for Engineering Education (AaeE) *4th Global Colloquium on Engineering Education* (GCEE) in Sydney, Australia, in September 2005. The colloquium had the themes of globalization of engineering education, the K-12 pipeline, and the transformations of the disciplines. It provided an excellent opportunity for international leaders and policy makers from industry, academe, and government to gather and discuss the major challenges in preparation for the next generation of engineering innovators. In particular, we held a meeting of presidents of global engineering education organizations and agreed to investigate how we might form an association for future cooperation.

The recent IEEE Series Meetings had several other interesting results. The Technical Activities Board (TAB) consists of the forty-one presidents of the technical societies and councils, the ten division directors, and the seven officers and standing committee chairs. The mission of TAB is to foster technological innovation and progress by advancing the technical activities of the IEEE for the benefit of the profession and humanity worldwide, and to represent the interests of Societies and Technical Councils within the IEEE. Issues affecting the societies and councils are brought to the 58 voting members for discussion, approval, and/or recommendation to the IEEE Board of Directors. At the February 2006 Series, TAB held a Governance Workshop before the regular meetings to discuss whether a change of structure would be beneficial to the operations of TAB since it has grown in the past few years. Workshop members agreed on the need to streamline operations, recommended immediate changes for some committee processes, and agreed to a continued examination of some models for restructuring, but were divided on whether to move to a bicameral structure.

The regular TAB meeting covered a myriad of topics. Among the most pertinent to the work of our society were the approval of two new awards we will now sponsor and a change in the method of allocating indirect costs to the member societies. In the past four years, the Education Society has increased the number of its Chapters from nine to approximately fifty-four with four more pending. This phenomenal growth with the coordination of **Rob Reilly**, our Chair of the Chapters Committee, is strengthening the networks we want to encourage for the benefit of our members. To recognize the good work being done, the Education Society requested and the TAB approved two new awards: the *Chapter Achievement Award and the Distinguished Chapter Leadership Award*. We urge you to consider nominating our outstanding peers for these and other society awards to recognize their contributions and encourage others in the work they do. Details can be found on our website. The TAB also approved a report from its Finance Committee to change the method by which indirect infrastructure charges are allocated to the societies beginning in fiscal year 2007. This will result in some redistribution of charges among the societies, and we can expect some effect in the future.

The challenges of a changing global environment will require vision, direction, and determination. As we respond to the many issues mentioned above and many more to come, the strength of our members reinforced by their diversity through the networks of our organizations will provide the means for success.

If you have any comments or questions concerning anything in the article, or would like more information about the Education Society, please contact me or visit our website.

Best wishes,

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[1]Friedman, Thomas L. *The World is Flat*. Farrar, Straus, and Giroux. New York NY. (2005).

[2]Committee on Prospering in the Global Economy of the 21st Century, *Rising Above the Gathering Storm, Energizing and Employing America for a Brighter Economic Future*. The National Academies Press, Washington DC. (2005)

[3]Bush, George W. *State of the Union Address by the President*. United States Capitol, Washington DC. (31 Jan 06)

[4]Executive Office of the President of the United States. Budget of the United States Government: Fiscal Year 2007. U.S. Government Printing Office. Washington DC. (Feb 06)

[5]U.S. Legislation (pending): *National Innovation Act (NIA) (S. 2109); Protecting America's Competitive Edge (PACE) Acts – Energy (S. 2197), Education (S. 2198), and Finance (S.2199).*

From the IEEE Committee on Engineering Accreditation Activities

Recent Engineering Accreditation Activities

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Accreditation visits

This has been a very busy year, with IEEE assigning visitors for 123 engineering programs, a large increase from 2004-05 when just 85 programs were visited. Following are the titles of the programs visited, with the number of each such program in parentheses: Computer and Information Engineering (1), Computer and Telecommunications Engineering (1), Telecommunications Engineering (1), Computer Engineering

(40), Computer Science and Engineering (4), Electrical and Computer Engineering (2), Electrical Engineering (61), Electronic Engineering (1), Engineering – Mechatronics Concentration (1), Engineering (4), Engineering Physics (3), Engineering Science (2), Systems Engineering (1), Wireless Engineering (1). Beyond the "big two" of Electrical Engineering and Computer Engineering, we see the continued appearance of programs with new titles, representing either specialties within Electrical and Computer Engineering (such as Telecommunications), or interdisciplinary technologies (such as Mechatronics).

New Engineering Program Criteria?

A question which the IEEE Committee on Engineering Accreditation Activities frequently addresses is, "Should new program criteria be created for a specific area?" At present program criteria in Mechatronics have been proposed by the ASME and may be accepted by ABET this summer. Program criteria in Systems Engineering have also been suggested by other societies. IEEE's position is that new program criteria should not be considered until and unless a substantial number of programs bearing the name of the proposed criteria have been put in place. When new program criteria are proposed, there must be a "lead society" and possibly one or more "cooperating societies." The lead society supplies the program visitors and is responsible for proposing changes in the criteria with the involvement of the cooperating societies. This system may have problems when multiple societies can claim "lead" status. The situation could be particularly awkward if one potential lead society desires program criteria while another one does **not** desire them. At present IEEE is working with ASME on a "Co-Lead Society" approach if the Mechatronics criteria are adopted.

One way to eliminate these complexities would be to eliminate program criteria entirely, and some in IEEE and other societies suggest that just such a plan be developed. It has been suggested that the Program Educational Objectives and Outcomes could be used to define the program with the given title, and that the institution could indicate the preferred society to supply the ABET visitor.

Accreditation and Gender Imbalance

Moshe Kam's article in the November 2005 issue of *The Interface*, titled, "Why Janie won't go to Engineering school? (Hint: Janie is not dumb)," was provocative. If we accept the basic thesis of the article (that **we** need to change what **we do** in engineering education), then what should be the implications for accreditation? I honestly believe that the present criteria would allow the accreditation of some very different-looking engineering programs, and my guess is that a major constraint to an institution considering doing something very different, is not the *criteria*, but fears regarding the *ABET visitor* who comes to campus. How can we show to engineering programs that ABET and ABET visitors really do welcome innovation? If I find the answer, it will be in the next issue of *The Interface!*

For me the following true story encapsulates aspects of both the strength and the weakness of our profession, and illustrates Moshe's point. Over lunch at a meeting of ABET visitors and team chairs several of us were chatting about our experiences on visits (nothing confidential). The team chair at our table commented on her recent visit to a school in the Southwest, a region of the country that her husband had never visited. He asked if he could come along. She said yes, but only if he stayed in a separate room at the hotel. She would be working so intensely and such long hours that she needed freedom from any intrusions. On the one hand, this is admirable; it shows our dedication to our profession (even on weekends). On the other hand, I believe it illustrates a "macho," "get out if you can't take it," "work in preference to people" attitude that repels a significant number of undergraduates from pursuing the profession.

A Vision for ECE Education

Some time ago in *The Interface* I mentioned the development of a Vision for Electrical and Computer Engineering Education. Attempting to both define the profession and forecast its form in the future was challenging, but I believe that a good result was obtained by the many who contributed ideas. Our Vision, which should have been approved by the IEEE Educational Activities Board by the time you read this, states:

Electrical and Computer Engineering education in the 21st century will:

- Instill the knowledge, skills, and wisdom by which matter, energy, and information are used to create products, processes, and services to improve the human condition.
- Foster the ability and agility to adapt to emerging and evolving technologies.
- Emphasize environmental and economic impacts of engineering practice.
- Emphasize adherence to high ethical standards in engineering practice.
- Expose students to globalization in engineering practice, to the issues and impacts of mobility (both geographical and technological) on engineering practice, to the importance of diversity in creating products, processes, and services, and to the impact of scale and complexity in creating products, processes, and services.
- Prepare graduates to work productively and provide leadership in a broad range of professional career paths.

John Orr

A Message from the President of IEEE-USA

Ralph W. Wyndrum, Jr.,
President, IEEE-USA

Welcome to the New Year, fellow U.S. IEEE members. I hope you enjoyed time with family and friends, while renewing your spirit.

In my years of service, I have kept the IEEE-USA mission close to my heart. As your 2006 IEEE-USA President, it is my guiding purpose. Our mission is "to recommend policies and implement programs specifically intended to serve and benefit the members, the profession and the public in the United States in appropriate professional areas of economic, ethical, legislative, social and technology policy concern."

To me, our mission translates into four primary areas of focus:

- Ensuring that U.S. technology policy enhances America's future and protects American workers
- Developing new tools and improving our career resources for U.S. IEEE members
- Supporting and publicizing valuable continuous education opportunities for our members
- Promoting IEEE fields of interest needed by the next generation of technical professionals

In 2006, we have a prime opportunity to act on our first focus, technology policy. As a participant in the National Innovation Initiative, IEEE-USA will urge Congress to pass comprehensive legislation designed to promote U.S. innovation and competitiveness, starting with the National Innovation Act (S. 2109), introduced this past December by Senator **John Ensign** (R-Nev.) and Senator **Joseph Lieberman** (D-Conn.).

In addition, IEEE-USA will continue to support immigration reforms that enable the United States to admit foreign technical talent as new Americans rather than as "guest workers," and has endorsed legislation designed to reform the flawed H-1B visa program. *The Defend the American Dream Act* (H.R. 4378) seeks to strengthen safeguards for affected workers, redress the weak prevailing wage requirement, require employers to actively admit American workers, as well as improve H-1B program administration and enforcement in order to reduce fraud and abuse.

We applaud Congressman **Bill Pascrell** (D-N.J.) for sponsoring this bill, and IEEE-USA will support this legislative effort to protect U.S. IEEE members and their careers. Other IEEE-USA policy priority issues for 2006 include retirement security, e-health-related measures, and the planned revamping of the U.S. patent system.

IEEE-USA will support our second focus by continuing to enhance the *Employment Navigator* with its several-million job listings, resume tools and other resources. Each day, the *Employment Navigator* collects more than five-million job leads from more than 170,000 Web sites, and consolidates them into a single, searchable database. As many of you already know, nearly one-third of the jobs available to subscribers are not found on public job boards.

We will also continue to promote the IEEE-USA *Career and Employment Strategies Forum*. With more than 2,300 members, this thriving online forum provides discussion areas, job opportunities and other useful information for members who wish to communicate and collaborate on career topics. The *Consultants Database and Salary Service* are also slated for major upgrades this year.

The IEEE-USA *Employment Navigator* complements the IEEE Job Site, which provides access to more than 3,000 employers who are specifically looking to recruit from IEEE members. The nearly 41,000 registered members can view and apply for nearly 10,000 jobs at the site. This resource has raised approximately $925,000 in revenue for the IEEE, which, in turn, allows us to offer more services to IEEE members.

Turning to continuous education, IEEE-USA is working with the IEEE Educational Activities Board to make available the best of the IEEE's educational content through one-hour online learning modules. *Expert Now IEEE* contains the latest information on emerging technologies and seminal works presented at the highest-rated IEEE conference tutorials, short courses and workshops. These unique, Web-based courses run the technical gamut from aerospace to vehicular technology, and are designed to save members time and travel costs.

In addition, IEEE-USA is offering 29 online "*soft skills*" courses with partner AchieveGlobal. And we'll continue to provide our members with *P.E. Exam* review courses in the months ahead.

Further, IEEE-USA is joining with IEEE Educational Activities in promoting the IEEE *Education Partners Program* in which IEEE members have access to some 6,000 courses from more than a dozen providers to help members meet their continuing education, certificate and graduate needs. And savings on this program could easily offset the cost of member dues.

Finally, in 2006, IEEE-USA will be sponsoring the expansion of the IEEE *Teacher In-Service Program (TISP)* into Massachusetts and Indiana. And we'll be leveraging our volunteer networks to support the future of the profession by working with IEEE Educational Activities to promote pre-university initiatives such as TISP and the K-12 student mentoring program.

Both provide useful resources for U.S. IEEE members to bring technology education into their local schools. I commend and support these committed individuals who strive to enhance the level of technological literacy, science and mathematics among pre-university educators and their students.

We must all renew our commitment to support the IEEE-USA mission and our careers by making our voices heard in Washington as well as in our local schools.

I look forward to sharing this exciting year ahead with you. Please share your ideas with me at r.wyndrum@ieee.org.

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ASEE ECE Division, IEEE Educational Activities, and Related Events

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As we approach the time of *ASEE Annual Conference* this June in Chicago, I wanted to reflect/summarize some of the activities and related events. First of all we need to recognize the hard work of Professor **Victor Nelson**, Auburn University, for his dedication and excellent work to guarantee the quality program that attendees expect of technical/professional and business sessions sponsored by the ASEE ECE Division. We are again able to offer paper sessions, BSECE, poster, and a panel discussion (teaching/learning with technology, moderated by Dr. **Timothy Greene**, Dean of Engineering, Western Michigan University.)

We hope that electrical and computing educators and researchers can benefit from these presentations and enable us to provide a forum for discussion and brainstorming. Dr. **Satish Udpa**, Dean of Engineering at Michigan State University and division chair, Vic, myself and a large number of reviewers and session chairs are volunteering time and efforts to this major annual conference and event. Like in the past years, we received a large number of abstracts and are now in the process of reviewing drafts/final papers. Another person I want to mention is the division's secretary/treasurer, Dr. **Dennis Silage**, of Temple University, who will be program chair for the 2007 conference in Hawaii (be nice to Dennis so you can go there!). At the end of the day whatever we do and accomplish are the results of teamwork and unselfish dedication of many hard-working volunteers that ASEE, IEEE and other professional societies depend on and those who are active members of these *learning communities*.

(IEEE R4 ExComm in Chicago, January 28, 2006, from left: Lightner, Mousavinezhad, Vakilzadian, eit 2005 chair, and Dawson, R4 director-elect.)

I have always tried to make my columns' contents balanced between the ASEE and the IEEE. We just finished a Region 4 ExComm meeting in Chicago where we heard from President **Michael Lightner**. As most of you know by now IEEE membership has grown and most of the growth is coming from outside R1- R6 (R9 is the fastest growing). More good news is student membership is up. In this column you will see a picture taken with Mike during the executive committee meeting. In this regard I want to mention the success of the IEEE e IT (electro/information technology) conferences which we started in 2000, also in Chicago. Keynote speakers for the 06 e IT include Dr. **Lotfi Zadeh**, of BISC Group at The University of California, Berkeley (for more information please contact Dr. **Lalita Udpa**, conference co-chair and visit the Web site, www.eit-conferenceinfo/eit2006). Future e IT conferences will be hosted by Illinois Institute of Technology (2007) and the University of Windsor (2008). I will welcome suggestions and comments you may have about these conferences which are primarily sponsored by Region 4.

Finally, I want to conclude by again mentioning that it is very crucial that organizations, universities, government and business leaders continue their support of the professional societies such as IEEE and ASEE. During the ExComm meeting I was honored to be nominated to run for R4 director-elect position this fall (election to be conducted by the IEEE). As part of my statement I have mentioned that we need the visibility and support and encouragement provided by the supervisors, presidents, managers, deans, directors CEOs, department chairs and other leaders in our engineering profession and the government for the numerous volunteers (members of our learning communities) so that we are able to bring you quality educational, technical and professional programs (such as conferences, workshops, tutorials). As we push for more R&D and better productivity we need to keep in mind that these are volunteer organizations and as we all know it is becoming more difficult to spare time and energy from work, family and other responsibilities to dedicate contributions to ASEE, IEEE and other professional technical activities. As I remember, U.S. Representative **Vernon Ehlers**, during a speech at the 50th celebration of West Michigan Section (October, 2004) mentioned that engineering education and research are key factors for the economic growth and well-being of citizens. Like Vern, I am also concerned we are not getting enough high school students to choose engineering majors as they enter college. Obviously the main responsibility falls on the shoulders of organizations such as IEEE and ASEE to educate/train future generations of engineers throughout the world.

Hossein Mousavinezhad
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IEEE Education Society
Membership Development chair
Past Chair, ASEE ECE Division

Letter to the Editor

January 25, 2006

Mr. Sayle,
I am writing concerning Mr. **Kam**'s article in your November 2005 issue of *The Interface*. I fail to understand why an article such as this is even allowed space in the publication, let alone "be interesting".

I taught for 20 years in a tech school after a 25-year electrical engineering career. I have had hundreds of students in 2-year Associate programs, hundreds of technical-subject apprentices and dozens of students in at-plant industry courses over that time. I had, if memory serves me correctly, 6 female students. This result was in spite of the continuous presence of WIE, seminars for women, special introductory classes for women and every kind of "helping" incentive that could be applied. Mr. Kam's leading comment "Janie is not dumb" says it all and should be the end of the discussion. As evidenced by Mr. Kam's comments about other professions, if women see an advantage to going there, they will go there, breaking down any barriers in the process.

Please refer to the ad for the IEEE job helpline in the December 2005 issue of *IEEE Spectrum*. It came to my house on the same day as did *The Interface*. If *this* technical person is in fear of her job, what reason is there for anyone to enter the profession let alone a woman who has multiple chances to enter any other? Remember, "Janie is not dumb". She reads the ads, too, but there also may be other considerations in her choices.

Recently, **Bob Pease** of *Electronic Design* (14 April 2005) , dared to publish some aptitude findings from testing that has gone on over decades. It seems that the aptitudes needed for engineering careers show up in about one female to four males. So maybe, "Janie", not being so dumb, realizes that only about 20% of females will be happy with engineering and takes a long, hard look to see if she is one of those who feels comfortable with engineering before leaping into such an unrewarding pool. This, alone, may well explain the percentage figures for women in Electrical engineering. And also unrewarding? Yes, unfortunately, yes. So, it is my feeling that the aptitude discrepancy and the lack of rewards in the present engineering domain explain all that needs to be explained. But, let's look at some basics. Where do they go and why? The where is answered in the article.

It says that high achieving, high intelligence females choose medicine and the law. From my reading, it seems that more and more are also going into finance (I guess these are the ones who ARE interested in math). And why? There are some lessons here if we care to listen. Study of medicine, finance and the law yield *licensed*, community based, stable, independent practitioners with strong professional unions and high earning potential. They also happen to feed the natural proclivity of women to be talkers and helpers, but that is an aside to our discussion.

Contrast that with electrical engineering. Electrical and especially electronic engineers appear to have a half-life of about 15 years based on my observations. Far from being independent, they are treated pretty much like chattel in many organizations, are threatened regularly by layoff and the companies they work for regularly bankrupt themselves, "move the operation", outsource the jobs, merge, "get out of that line of business", etc. They are constantly faced by a damned if you do, damned if you don't choice: If they actually work to complete a significant electronic engineering project, they will summarily be laid off "because their knowledge isn't current any more"; if they refuse the project because of the realization that it will take a significant amount of time, they will be laid off for not doing the job that is offered. There is no way "up" because they are seen to be nerdy non-communicators and not management material. Few are interested in handling money so are rarely found in that part of the organization. Is that unrewarding enough? Might those considerations be factored into a career choice by our "Janie" whom we assumed at the start "was not dumb"?

What can be done? Mr. Kam proposes changing the curriculum to make it more user friendly. That is not the problem. We have plenty of studies and industry advisors who all say that the subject material in the curriculum is not the problem. I propose a far more sweeping revision: A change of mission. Electrical engineering schools need to be in the business of producing licensed practitioners who can reasonably expect to enter into lifelong careers that are stable and rewarding whatever the ratio is of males to females in the resulting student body. At present, our best schools make it a profitable practice to produce graduates who will be outsourcing replacements in a profession that can be easily sent to low-wage countries. This is the true problem, especially in electrical/electronic engineering (compare to Civil Engineering careers). Articles about how many female engineers there are only divert our attention from studies of this basic problem.

I would like to suggest that the only electrical engineers graduated should be in fields yielding jobs having to do with the infrastructure of our country. In many schools this used to be the "power option", it should be the major option. Branches of this field should include energy transformations, networking of energy sources, electrification of the transportation infrastructure, industrial process control, catch-up robotics, medical electronics, etc. A minor option should be in the communications infrastructure including industrial wireless control. Notice that there is no emphasis on "device design". Schools in the USA have produced all the device designers needed, they reside in China and India.

Engineering companies working in the infrastructure and industrial areas will hire qualified and (necessarily) licensed engineering personnel. It should be assumed that every graduate of an engineering school has the basic licensing

requirements under their belt. If the cry goes up that "in this program, licensing is not needed", then the program should be cut. Engineers would do well to form as strong a union as the AMA or the ABA to further their aspirations and raise their earning potential. The IEEE has refused this role, preferring to cater to the multinationals in commerce and academics.

Sound like a recipe for disaster in the schools? Well consider that all prognostications about the future of the USA claim that a meltdown will occur in the commerce of this country. This will happen because our country is run by profit-oriented politicians and businessmen. Compare that to China where the country is run by a small group of ENGINEERS. Our best and brightest will go to China and India to study where best and brightest counts. They will not stay here. The select few from those countries who previously have come here to learn will teach at the Harvards and Stanfords of those countries. Their scholars will no longer come here either. In order to feed, clothe and tend to the medical needs of the people here, engineers will be needed, here. Sadly, all the cellphones and iPods in creation will not help us. It is high time that the academics realize these facts and start to change mission.

I am glad to see that the ASEE group is beginning to promote upgrade from the 2 year schools' Associate grads to 4 year Bachelor degree studies. Perhaps that will be a start.

Sincerely,

Kenneth Exworthy
BSEE, MSEE, PE, Instructor at Northeast Wisconsin Technical College (Ret.)
LM IEEE, LM ISA
eekwex@cybrzn.com

Another Letter

Dear Professor Sayle,

Frank Splitt recommended that I contact you. On 23 February he forwarded a message to you (contents follow), and I would like to follow up. Dr. Splitt suggested that you would be a valuable resource for the '10xE' (Factor 10 Engineering) project that I am working on with **Amory Lovins** here at Rocky Mountain Institute. There are a number of areas where we require assistance, and I would like to hear from you if you think there is anywhere you can help us accelerate the reform of engineering pedagogy and practice.

We are constantly building our network of engineering practitioners, teachers, and institutions that have an interest in radically efficient whole-system design. If you know anyone that we should be in touch with, please contact me. Also, if you have come across any cases that are radically more efficient than standard practice in their use of natural resources, while having lower capital cost (or a very quick payback), please send me a brief description. And lastly, if you have any general ideas on how we might strategically best influence engineering education, I would love to hear them.

In the coming months we will be writing articles in major engineering publications, collecting cases, and securing funding. As early as summer 2007 (if we can organize and fund it by then) we aim to write, in summer-study and charrette formats, a casebook of integrative, radically efficient engineering.

Thanks for thinking about this endeavor, and I look forward to hearing from you.

Sincerely,
Imran Sheikh

I am a researcher at Rocky Mountain Institute (RMI), a nonprofit applied research center, writing to you on behalf of my CEO, Amory Lovins. We are working on a project entitled '10xE' (Factor Ten Engineering), which should be an important step in accelerating reform of engineering pedagogy and practice, and we hope that you might be willing to assist us with this endeavor.

As you may know from Natural Capitalism (http://www.natcap.org), RMI has developed, over the past 24 years, a considerable body of practical experience, in 22 sectors of the economy, achieving expanding rather than diminishing returns to investments in energy productivity. We 'tunnel through the cost barrier', making very large energy and resource savings cost less than small or no savings, in two ways: (1) optimizing whole systems for multiple benefits (rather than isolated components for single benefits) -- thus getting multiple benefits from single expenditures – or (2) 'piggybacking' retrofits onto changes being made anyhow for some other reason, such as renewing the aging façade of a building. This approach yields such results as:

- Save half of motor-system electricity; retrofit payback typ. <1 y
- Similar w/ >50% retrofit savings of chip-fab HVAC power; new fab: 20% savings with -30% capex; next should save >50%, cost less
- Retrofit very efficient oil refinery, save 42%, ~3-y payback
- Retrofit offshore oil platform, save half the electricity, get the rest from wasted energy streams

- Redesign $5b gas-to-liquids plant, -$1b capex, save >50% energy
- Retrofit big LNG plant, 40% energy savings; ~60% savings in new plant, costs less
- Redesign giant platinum mine, 43% energy savings, 2-3y payback
- Redesign data center, save 89%, cut capex & time, improve uptime
- Redesign supermarket, save 70-90%, better sales, lower capex
- Redesign new chemical plant, save ~3/4 of electricity just in auxiliaries, cut construction time and cost by ~10%

In recent years, we've redesigned ~$20b worth of facilities on these lines. Our clients are happy to learn how to do such radically efficient designs. But we're not so happy, because we keep seeing the same design errors over and over. If the designs had been properly done in the first instance, such improvements wouldn't be possible. Indeed, the incorrect methodologies that underlie much of the inefficiency we observe are clearly set out in all the leading engineering textbooks!

We earn half the Institute's revenue from consultancy to correct these errors in minute particulars. But it would be far better to change engineering pedagogy and practice so such errors are ultimately extirpated. To this end, we have hatched an ambitious, but as yet unannounced, plot called '10xE' (Factor Ten Engineering). We aim to assemble an outstanding group of diverse engineering practitioners and teachers from round the world to write a casebook of integrative, radically efficient engineering. The casebook will organize several dozen cases in facing-columns format (e.g. big pipes / small pumps vs. the usual small pipes / big pumps), spanning the range of engineering disciplines and common applications, and typically achieving order-of-magnitude energy and resource savings -- sometimes considerably more -- with lower-than-normal capital cost. Through such astonishing but, once understood, blindingly obvious cases, we aim to bring to firms and classrooms worldwide a sound and compelling pedagogic basis for the nonviolent overthrow of bad engineering.

For this purpose we are starting to assemble a portfolio of high-brain-Velcro cases and first-rate practitioners and teachers best applying whole-system design. In order to build our collection of cases and network of engineers who think this way, we need your help.

We have two requests. We'd like to enlist you in helping us build our network of teachers and practitioners by finding some unusual people within your network that come up with truly integrative solutions to engineering problems. These people could be colleagues, students, or even authors you have read. We would appreciate your guidance in directing us to people or organizations that might be valuable to 10xE. Second, to build our collection of cases, we also need help from the engineering community. If you know of any elegant, repeatable, whole-system solutions that 'tunnel through the cost barrier', we want to hear about them. Preferably at least a Factor 10 increase in resource productivity over standard practice is present, but even Factor 4 cases could be interesting.

We appreciate your thinking about this intriguing challenge, and look forward to your reaction.

Sincerely,

Imran Sheikh
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Former Northwestern Faculty Fellow to Receive Robert Maynard Hutchins Award

The Drake Group (TDG) has announced that its *2006 Robert Maynard Hutchins Award* will be presented to Dr. **Frank G. Splitt**, a former Faculty Fellow at Northwestern University.

The *Hutchins Award* is given annually to faculty or staff members who take a courageous stand to defend academic integrity in higher education, often risking job security in doing so.

Dr. Splitt's Oct. 5, 2005, letter to the editor of *The Wall Street Journal*, "Who Wants to Tackle Biggest Man on Campus?" – written in response to **Skip Rozin**'s Sept. 15, 2005, article, "The Brutal Truth About College Sports" – and the related retaliation by Northwestern University, have focused attention on TDG's efforts to reform college sports as well as on the sometimes painful personal consequences of these efforts.

Diane Carman's Dec. 11, 2005, *Denver Post* column, "Colleges are fumbling sports reform," reiterated the need for serious reform – keying on recommendations suggested by Dr. **James Duderstadt**, President Emeritus of the University of Michigan, and author of the foreword to Dr. Splitt's essay, "The Faculty-Driven Movement to Reform Big-Time College Sports," http://thedrakegroup.org/Splitt_Sequel.pdf.

The above, taken together with a Dec. 30, 2005, *New York Times* editorial, "A College Sports Scam," and related articles by **Pete Thamel** and **Duff Wilson**, represent a college-sports reform redux – a rekindling of the fire for reform ignited by **Rick Telander**'s 1989 book, *THE HUNDRED YARD LIE: The Corruption of College Football and What We Can Do to Stop It*. Over the years, Telander, a former Northwestern University football player and now a nationally renown sportswriter, has literally exhausted himself pointing out the money/power aspects of the elite, tax-exempt, revenue-producing, big-time college-sports entertainment business.

Furthermore, **Tony Messenger**'s Aug. 31, 2005, *Columbia Tribune* column, "Big money rules decisions in all aspects of the NCAA," **Mike Steinberger**'s Dec. 16, 2005, *Financial Times* article, "US college sports graduate to big business," **Don Walker**'s Dec. 25, 2005, *Milwaukee Sentinel Journal* article, "Money Game," and Dr. Splitt's appearance on **Bob Gilbert**'s Jan. 7, 2006, WCBR-Knoxville radio program, have combined to stimulate considerable interest in TDG's congressional initiative.

This initiative is discussed in Dr. Splitt's essays on college-sports reform and in TDG Executive Director **David Ridpath**'s remarks at the Nov. 8, 2005, meeting of the Knight Commission. All of this material can be accessed at: http://thedrakegroup.org/News.html. There, your attention is called to Congresswoman **Schakowsky**'s March 17, 2005, remarks for the Congressional Record and to Dr. Splitt's most recent essays – "Sports in America 2005: Facing Up to Global Realities" and "Are Big-Time College Sports Good for America?" These essays illuminate the negative impact of America's addiction to college-sports entertainment on higher education, especially in today's increasingly competitive global economy.

The essays suggest a way to not only reform college sports, but also to provide incremental tax revenues to help finance the implementation of the recommendations made by the National Academies in their call-to-arms report, "RISING ABOVE THE GATHERING STORM: Energizing and Employing America for a Brighter Economic Future." The report's recommendations for scientific research, education, and energy were echoed by President **Bush** in his Jan. 31, 2006, State-of-the-Union address.

For more information contact B. David Ridpath, Executive Director,

The Drake Group, http://www.thedrakegroup.org/, +1 662-325-0854, dridpath@colled.msstate.edu

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Are Awards Really Worth the Trouble?

Joseph L.A. Hughes
Vice-President and Awards Committee Chair
IEEE Education Society

I recently read a column complaining about teaching awards on the grounds that (1) the selection process is inherently subjective, (2) there are far more people deserving of the awards than actually receive them, and (3) time spent trying to win the awards could be used more productively on other activities. It's hard to disagree with those three statements. But, competition seems to be part of our nature, and winning certainly matters. (If you don't believe that, go watch a "no score" youth soccer or baseball game. It won't be hard to find a participant who can tell you exactly how many points each team scored.)

However, both extremes of the argument seem to miss a key point about awards: It's not just about winning.

As I'm writing this column, the 2006 Winter Olympics have just concluded. Judging is subjective – maybe even political – in many events. Even when the outcome is determined objectively, is it really fair that someone can miss out on a medal when everyone knows the results would likely be different if the event was run one more time? Most of the participants – and thousands of hopefuls who didn't even qualify – certainly could have spent their time working on something more demonstrably productive. Despite these concerns, we celebrate the Olympic champions for their achievements. But we also admire many of those who don't win medals – for their efforts, their dedication, and their commitment to excellence. Often, the most inspiring stories and the greatest joys revolve around athletes who knew they would never win, but didn't let that stop them from trying.

I think the same is true of the many awards given by academic institutions and professional societies. We recognize and celebrate the winners for their accomplishments, we acknowledge that there are many others who also deserve recognition, and we seek to motivate and encourage others to aspire to excellence in teaching, service, and other professional activities.

The deadline is June 15 for submitting nominations for the 2006 IEEE Education Society awards. I encourage you to nominate colleagues who deserve recognition for their achievements and who will serve as examples and inspirations for all of us. Detailed descriptions of the awards and nomination instructions are available on the Society web site: **http://www.ewh.ieee.org/soc/es/**

There are two new awards for 2006, the "Chapter Achievement Award" and the "Distinguished Chapter Leadership Award." Under the leadership of **Rob Reilly**,

chair of the Society's Chapters Committee, the number of Education Society chapters has grown to 50, more than five times the number a few years ago. These awards will recognize outstanding leadership and activities at the local chapter level.

Finally, the "Meritorious Service Award" has been renamed as the "**Edwin C. Jones, Jr**. Meritorious Service Award." If you've been involved with Education Society activities, you've almost certainly met Ed and benefited from his contributions. He was the third recipient of the society's Meritorious Service Award, in 1980, and is still actively involved with the Education Society. He served as a society officer from 1970-76, including two years as president, and as editor of the IEEE Transactions on Education from 1982-84. In recent years, he has served on the society awards committee and as a member of the IEEE Committee on Engineering Accreditation Activities. He is University Professor and Associate Chair, emeritus, Department of Electrical and Computer Engineering, Iowa State University. Prior to joining Iowa State in 1966, he was an Assistant Professor at the University of Illinois from 1962-66. Ed received his PhD in 1962 from the University of Illinois; the DIC in 1956 from Imperial College of Science and Technology, University of London; and the BSEE in 1955 from West Virginia University. His honors and awards include: Fellow, Institute of Electrical and Electronics Engineers; Fellow, American Society for Engineering Education; Fellow, American Association for Advancement of Science; Fellow, Accreditation Board for Engineering and Technology; IEEE Centennial Medal, 1984; ASEE Centennial Medal, 1993.

TAEE'06 7th International Conference on Technologies Applied to Electronics Teaching

Madrid, Spain, 12-14 July 2006

The Origins

In 1992, different initiatives inspired by European projects like CTISS (Computer in Teaching Initiative Support Service) were carried out in several Spanish universities. One of these initiatives, already well consolidated, was TAEE (Tecnologías Aplicadas a la Enseñanza de la Electrónica – Technologies Applied to Electronics Teaching).

The First Congress was celebrated in 1994 in Madrid, and since then other congresses have been celebrated every two years. These congresses are oriented to Educators related to the Electrical and Electronics areas. In all these congresses there has been an important participation of companies of this sector. The cities of Madrid, Barcelona, Sevilla, Las Palmas and Valencia, places in which an important electronic industry and prestigious universities exist, have been the sites of the celebrated congresses to date.

In 1998, during the celebration of the III Congress, the participation was opened to the Latin American countries. This situation has been kept in later congresses. The inclusion of Latin American countries was stimulated by the participation of many universities in a program of the European Commission called Alpha.

Different participations of previous editions of the congress are included in: http://www.euitt.upm.es/taee/congresos_taee/congresos_taee.htm

In general, the average participation has been around 180 professors and the number of accepted communications has been around 120. The participation of Latin American countries has been approximately 15%.

Under the acronym of TAEE, not only congresses have been celebrated but other initiatives directed to the same objective have taken place. A "TAEE Resource Centre" has been created. In this Centre there are gathered the different didactic resources that have been presented in the TAEE Congresses or that have been donated by companies or groups of professors. This is a Centre of creation, application, evaluation and diffusion of resources and experiences on the use of the technologies to traditional or distance education. Its objective is the knowledge sharing and the reuse of the educational resources. Further information is in: http://www.euitt.upm.es/taee/recursos/Centro_Recursos_TAEE.htm

Now this site is being remodelled to allow a better use of the electronic platforms evolving to a complete knowledge resource centre.

Conference Information.

The VII Congress TAEE (TAEE06) will be celebrated at the Polytechnical University of Madrid from July 12 to July 14, 2006. In its organization, as in previous editions, several Spanish and Latin American Universities and different companies, will collaborate. There is a joint cooperation with the Spanish Chapter of the IEEE Education Society as well as the Technical Co-Sponsorship of IEEE.

It will be similar to previous congresses but it will also try to answer some present questions of great importance. Three main lines of different scopes stand out:

1. The European Space renovation raised by the implantation of the European Space for Higher Education. The Bologna Declaration has created a deep discussion on the approach of the university teaching in all European countries.

2. The renovation of the Spanish university degree titles is being developed now. During 2006, the debate will be focused on the elaboration of proposals coming from the academic world about the structure, rules and minimum contents of the future degrees among which "Electronic Engineering" degree is included.
3. Education using the Internet is undergoing a deep transformation that affects the way in which knowledge is shared. Concepts such as "learning objects" and "digital libraries" offer alternatives that must be analyzed and debated with the purpose of having a more reusable "Resource Centre".

VII TAEE Congress will be structured around the following elements:

- Plenary sessions – Round tables.
- Parallel tracks for the presentation of oral papers.
- Parallel tracks for the presentation of posters.
- Distance communication sessions.
- Demonstrations of finished educational products.
- Exhibitions of companies from the Electronics industry.
- Working group sessions.

The main topics of the Congress are the following ones:

- European Space for Higher Education: Methodologies oriented to the learning process. Training in competences. Collaborative work.
- Learning using the Internet: from the TAEE Resource Centre to the digital library. The learning objects. The Virtual Laboratories.
- Educational Resources for traditional education: Didactic material.

The topics that will be used to organize the collaborations will be:

- Introduction to the Electronics.
- Digital Systems.
- Electronic Instrumentation.
- Power Electronics.
- Technology and Manufacture.
- Regulation and Control.
- Networks and Systems.
- Signals and Communication Systems.

The official languages of the congress will be Spanish and English.

TAEE'06 Committees

It consists on outstanding teachers and educators (major part of them professors) of the main Spanish Universities and representatives of Portugal and Latin America.

General Chair: Jesus Arriaga García de Andoaín (Polytechnic University of Madrid)

Co-chair: Fernando Pescador del Oso (Polytechnic University of Madrid)

Advisory Committee:

- Juan Domingo Aguilar. University of Jaén, Spain
- José Mª Angulo. University of Deusto, Spain
- Gerardo Aranguren University of País Vasco, Spain
- Francisco J. Azcondo University of Cantabria, Spain
- Nuria Barniol. Autónoma University of Barcelona, Spain
- Eduardo Boemo. Autónoma University of Madrid, Spain
- Roberto Capilla. Polytechnic University of Valencia, Spain
- Pedro Carrión. University of Castilla La Mancha, Spain
- Gonzalo Casaravilla. Republic University, Uruguay
- Manuel Castro. Spanish University for Distance Education, UNED
- José I. Escudero. University of Sevilla, Spain
- Enrique Mandado. University of Vigo, Spain
- Asunción Morales. University of Las Palmas de Gran Canarias, Spain
- Lluis Prat. Polytechnic University of Catalunya, Spain
- José Miguel Paez. University of Costa Rica, Costa Rica
- Tomás Pollán. University of Zaragoza, Spain
- Reinaldo Vallejos. Technical University of Santa María, Chile
- Oscar Andrés Vivas. University of Cauca Popayan, Colombia
- Manuela Vieira. Engineering Institute of Lisbon (ISEL), Portugal

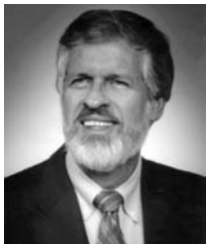
The local committee is integrated by different members from the Polytechnic University of Madrid. For further information see the conference web site at http://www.euitt.upm.es/taee06/.

Visit the IEEE Education Society Online at:

http://www.ewh.ieee.org/soc/es/

From your Editor

Bill Sayle
Editor, The Interface



You may remember *The Trilogy*, authored by **Frank Splitt**, and printed as a three-part series in the 2003 issues of The Interface. In *The Trilogy*, Frank presented his views on engineering education and its future. One thing you can count on from Frank, he says what he thinks. And now the latest: Frank was stripped of his Fellow Professor Emeritus title by Northwestern University for his ongoing public comments and crusade regarding college athletics

You also can tell we have had quite a bit of excitement regarding **Moshe Kam**'s article in the November issue of *The Interface*. His article also appeared in *The Institute* (December 2005), so it was read far and wide by many IEEE members.

One of the letters I received in response to Moshe's article was from **Kenneth Exworthy** and I offered to print it in this issue. Mr. Exworthy accepted my offer. His letter represents a view held by a significant number of engineers and reflects the professional tensions between our many constituencies.

Should we use technology just because we can? This question comes up from time to time when, in my opinion, "technology overkill" results in a more complicated life for the typical consumer, with no real benefit. One example is "voice jail," which at least saves companies money, but which often frustrates people trying to get a question answered. Another example is "the cellular telephone that does everything" but challenges the typical casual user when trying to make a simple telephone call. My latest example of "technology overkill" is the United States Department of Agriculture's mandate to the state departments of agriculture to implement the "National Animal Identification System" (NAIS). Sounds innocent enough until you learn every farm animal will eventually be identified by a Radio Frequency Identification Device (RFID). In the name of "food safety" every backyard chicken, every horse, every cow, hog, etc. (but not cats and dogs) would have to have an imbedded RFID chip. In Texas a large public outcry from small farmers, horse owners, and concerned consumers caused a postponement in the implementation of the first phase of this program: premises registration. With premises registration, every person who owns affected farm animals would have to register their property with the State Department of Agriculture. In the next phase, the RFID, or similar, tracking devices would be installed in each animal (except those associated with large processing plants, such as chicken processing plants). Movements of the affected animals from the registered property would have to be reported to the State Department of Agriculture within 24 hours, or the owner would be subjected to a hefty fine. Workable? I don't think so. Just imagine the horse owner going for a trail ride and having to report this action to the State Department of Agriculture. In my opinion, just another example of technology overkill with few, if any, perceived benefits.

One of the great educators and innovators in power electronics passed away on New Year's Day, 2006. **Richard G. Hoft**, was a wonderful human being whom I came to know quite well during various meetings and conferences associated with the IEEE Power Electronics Society. We use to go running together, often becoming lost and eventually finding our way back to the hotel, in such unfamiliar cities as Toulouse, France, and Kyoto, Japan. As with many really great people, Dick never volunteered much information about his professional accomplishments. Thus, it came as a surprise to me he was instrumental in the development of the first silicon controlled rectifiers while at General Electric prior to his distinguished career at The University of Missouri in Columbia, USA. All of us who knew Dick Hoft are richer for the experience. My best wishes to Mrs. **Merna Collis Hoft** and all of Dick's family and friends.

Bill Sayle
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