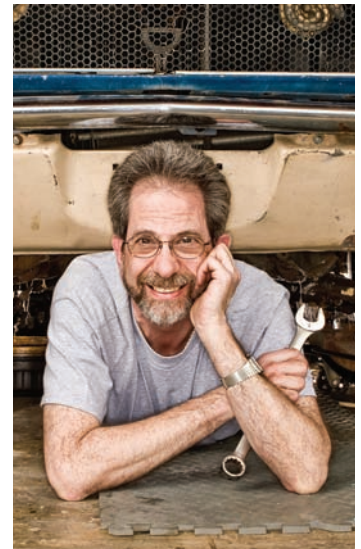# the institute

MELDING MIND & MACHINE

Recent refinements of brain-machine interfaces may redefine the expression "mind control." **P. 5**

PART-TIME PASSIONS
Some members have intriguing pastimes, such as restoring old Mustangs and performing in samba groups.   **P. 16**

Q&A With Kam And Ray

It's time to get a little more personal with the two candidates for 2009 IEEE President-Elect. Read about their hobbies, hidden talents, favorite IEEE events, and more.   **P. 6**

PRODUCTS & SERVICES

ONLINE DIRECTORY FOR NETWORKING
Want to find members who share your interests? IEEE memberNet, a new online directory, makes it easier.   **P. 13**

online

AVAILABLE 6 JUNE AT
www.ieee.org/theinstitute

SOCIAL EVENTS Learn about the fun activities some IEEE sections have set up to get members more involved with IEEE.

BOOKS Check out some of the newest Wiley–IEEE Press books, and read an interview with one of the authors.

It's 10:42 pm
and I'm in a Stevens graduate class.

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NEWS

IEEE AROUND THE WORLD

REGION 7: Canada
- The Pinawa hydroelectric power project in Winnepeg, Man., Canada, is named an IEEE Milestone. It became operational in 1906 and was the first year-round hydroelectric plant that successfully generated energy in spite of low temperatures and icy conditions.

REGION 1: Northeastern United States
- The dc-generating plant in the New Yorker Hotel in New York City is named an IEEE Milestone. At the time of its construction in 1929, it was the largest dc-generating plant in the United States, said to be capable of supplying electric power to a city of 35 000 people. The plant is still operational today.
- IEEE Springfield (Mass.) Section forms its first Graduates of the Last Decade/Women in Engineering joint affinity group.

REGION 8: Europe, Middle East, and Africa
- American University in Dubai, United Arab Emirates, and Notre Dame University, in Zouk Mosbeh, Lebanon, form WIE student branch affinity groups.
- IEEE Latvia Section is formed.
- Student branches formed in Austria at Johannes Kepler University, Linz; in Germany at the Ilmenau University of Technology, Thuringia, and Jacobs University, Bremen; at the University of Central Greece, Lamia; in Russia at St. Petersburg University of Film and Television; in Qatar at Carnegie Mellon, Doha; and in the United Arab Emirates at the Petroleum Institute, Abu Dhabi.

REGION 10: Asia and the Pacific
- 15th anniversary, Vellore Institute of Technology Student Branch, India.
- WIE student branch affinity groups formed in India at St. Xavier's Catholic College of Engineering, Chunkankadai; Siddaganga Institute of Technology, Karnataka; National Institute of Technology, Kerala; Netaji Subhas Institute of Technology, New Delhi; and Hindu College of Engineering, Sonepat, and in Nigeria at the University of Ibadan.
- IEEE Nanjing Section in China forms Zhejiang Subsection.

REGION 5: Southwestern United States
- Texas A&M University, in College Station, forms student branch.
- IEEE Denver forms GOLD affinity group.

REGION 3: Southeastern United States and Jamaica
- WIE student branch affinity group formed at the University of Florida, Gainesville.

REGION 6: Western United States
- 100th anniversary, Los Angeles Council.

REGION 9: Latin America
- WIE student branch affinity group formed in Brazil at the College of Technology and Science in Salvador and at São Paulo State University, and in Ecuador at Salesian Polytechnic University, Cuenca.
- Student branches formed in Brazil at the Federal University of Rio Grande do Norte and the Federal University of Viçosa and in Peru at Catholic University, San Pablo.

REGION 10 (continued)
- Student branches formed in China at Chongqing University and Huazhong University of Science and Technology, Wuhan; in India at Dayananda Sagar College of Engineering and New Horizon College of Engineering, Bangalore; Amrita School of Engineering, Coimbatore; Manoharbhai Patel Institute of Engineering and Technology, Gondia; Haldia Institute of Technology; Malla Reddy Engineering College, Hyderabad; Younus College of Engineering and Technology, Kerala; Muthayammal Engineering College, Namakkal; and Hindu College of Engineering, Sonepat; in Japan at the University of Hyogo; and in Pakistan at Bahria University, Karachi, and Fatima Jinnah Women's University, Rawalpindi.

Send your region or section news to institute@ieee.org.

LEGEND
- REGIONS 1–6
- REGION 7
- REGION 8
- REGION 9
- REGION 10

Annual Election Process to Get Under Way in August

Look for your annual election ballot package to arrive in August, a month earlier than usual. The new date is one of several deadline changes to the annual election process that take effect this year [see "Election Deadlines"]. All eligible voting members will receive via first-class mail a paper ballot and a postage-paid reply envelope. Included with the material will be information about how to access and return ballots electronically.

New members as of 30 June, as well as those elevated to member or graduate student member grades on or before that date, are eligible to vote.

The usual booklet with the candidates' biographies will be mailed only to members who voted by paper ballot in last year's election and to those who chose to have the booklet mailed to them this year in their Web accounts' member preferences. The booklet will not be mailed to members who submitted their ballot electronically, did not vote in last year's election, or updated their Web accounts' member preference specifying no booklet.

ELECTION DEADLINES

1 August
- IEEE annual election ballots are sent to all voting members by this date.

1 October
- Last day for ballots to be received from members, by noon Central Daylight Time USA (17:00 GMT).

13 October
- Last day for

Tellers Committee to announce vote tally to IEEE Board of Directors.

- Unofficial results are reported.

16 November
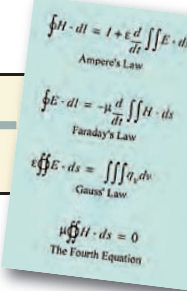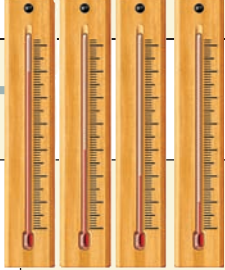- IEEE Board of Directors acts to accept report of Tellers Committee.

- Annual election results are made official.

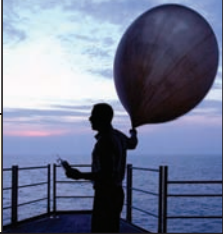## EXECUTIVE DIRECTOR RESIGNS

IEEE Executive Director and Chief Operating Officer Jeffry Raynes has resigned "for personal and professional reasons," effective 5 June. Raynes joined IEEE in November 2005.

IEEE President and CEO Lewis Terman plans to be responsible for day-to-day operations beginning 6 June. The IEEE Board of Directors will soon conduct a search for Raynes's replacement.

June

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6 **1933:** **The first drive-in movie theater** opens, in New Jersey.	7
8	9	10	11 1915: Birth date of **Nicholas Constantine Metropolis**, developer of MANIAC, a computer used in developing the hydrogen bomb.	12	13 1831: Birth date of **James Clerk Maxwell**, whose equations related electricity, magnetism, and inductance.	14
15	16	17 **17 June–22 June: IEEE organizational units** meet in Denver.	18	19 1623: Birth date of **Blaise Pascal**, mathematical theorist and inventor of the Pascaline calculating machine.	20	21
22	23 1912: Birth date of **Alan Mathison Turing**, the mathematician and logician who designed the ACE computer.	24 2009 President-Elect **Candidates Night** in Philadelphia.	25	26 1824: Birth date of **William Thomson**, developer of the Kelvin scale of absolute temperature.	27	28
29	30					

July

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3 1886: Birth date of **J. Howard Dellinger**, who helped develop the radiosonde, a balloon-borne device that relays data to weather stations.	4	5
6	7	8 1937: England begins its **999 emergency telephone system** for police, fire, and medical services.	9	10	11	12
13	14	15	16	17 1909: **The Shoshone Transmission Line**, an IEEE Milestone, begins carrying power to Denver from Glenwood Springs, Colo.	18	19
20 1937: Radio pioneer **Guglielmo Marconi** dies in Rome.	21	22	23	24	25 1857: Birth date of **Frank Julian Sprague**, developer of the first commercially successful electric streetcar system—an IEEE Milestone.	26 1989: Robert Tappan Morris is the first person indicted by the U.S. government on charges of releasing a **computer virus**.
27	28	29	30	31		

August

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
3 1811: Birth date of **Elisha Graves Otis**, inventor of the device that prevents elevators from falling if the hoisting cable is severed.	4	5	6	7	1	2
10	11	12 1960: NASA launches Echo 1, its **first telecommunications satellite**.	13 1977: Lightning triggers a **massive power blackout** in New York City.	14	8 1901: Birth date of the Nobel laureate **Ernest Orlando Lawrence**, inventor of the cyclotron.	
17	18	19	20 1911: *The New York Times* sends the **first around-the-world telegram**.	21	15	9
24 / 31	25 1877: Birth date of **Joshua Lionel Cowen**, inventor of Lionel electric toy trains.	26	27	28	22	16
					29	23
						30 28 August–1 September: **Region 8 Student Branch Congress** at the University of London.

Historical events provided by the IEEE History Center

IEEE events indicated in RED

JUNE: FROM LEFT: PETER JORDAN/PRESS ASSOCIATION/AP IMAGES; GETTY IMAGES; SMITHSONIAN INSTITUTION LIBRARIES; GUILLERMO LOBO/ISTOCKPHOTO. JULY: FROM LEFT: DOUGLAS FREER/ISTOCKPHOTO; IEEE; U.S. NAVY; VIRGINIA COMMONWEALTH UNIVERSITY. AUGUST: FROM LEFT: HULTON ARCHIVE/GETTY IMAGES; LIONEL; TIME MAGAZINE/TIME & LIFE PICTURES/GETTY IMAGES; QUEEN MARY/UNIVERSITY OF LONDON; NEW YORK TIMES CO./GETTY IMAGES.

Melding Mind and Machine

Brain-machine interfaces could someday help people with severe paralysis move their limbs, walk, and use a computer BY MICHAEL J. RIEZENMAN

Mind control is generally regarded as scary—conjuring up *The Manchurian Candidate* and other depictions of brainwashing. But recent refinements of brain-machine interfacing (BMI) may redefine the expression to mean something totally different: control *by,* not *of,* the mind. It is a field that holds out the hope of allowing severely paralyzed people to communicate with the world, move their limbs, and even walk.

The basic idea is simple: paralysis is caused by a break in the neural pathway between the cognitive part of the brain, where the intention to make a movement is generated, and the muscles that do the moving. So an artificial system that senses the neural signals generated in the brain, analyzes what the brain is trying to do, and then moves the limbs mechanically can bypass the roadblock in the pathway and restore normal functioning. Such BMI systems are not just for moving limbs; for example, signals from the brain can be harnessed to move the cursor on a computer screen with no actual limb movement.

Of course, making that happen is far from simple. But laboratory experiments have proved the viability of the approach, and a number of IEEE members are working to develop solutions to the many practical problems that have prevented the idea from becoming a clinical reality.

ACCESS One problem is signal acquisition, specifically the design of the actual physical interface that taps into the brain's neural signals. The ideal would be to sense the signals noninvasively, through electrodes placed on the scalp. But signals obtained that way have poor signal-to-noise ratios compared with ones obtained by arrays of microelectrodes inserted directly into the cerebral cortex, the outermost portion of the brain, points out Member Justin C. Sanchez, a professor of pediatrics, neuroscience, and biomedical engineering at the University of Florida, Gainesville, and chair of the Gainesville chapter of the IEEE Engineering in Medicine and Biology Society. Moreover, microelectrodes can pick up signals from individual neurons, while external electrodes reflect the aggregate of many millions of neurons.

On the other hand, poking electrodes into the brain is a surgical procedure that risks infection as
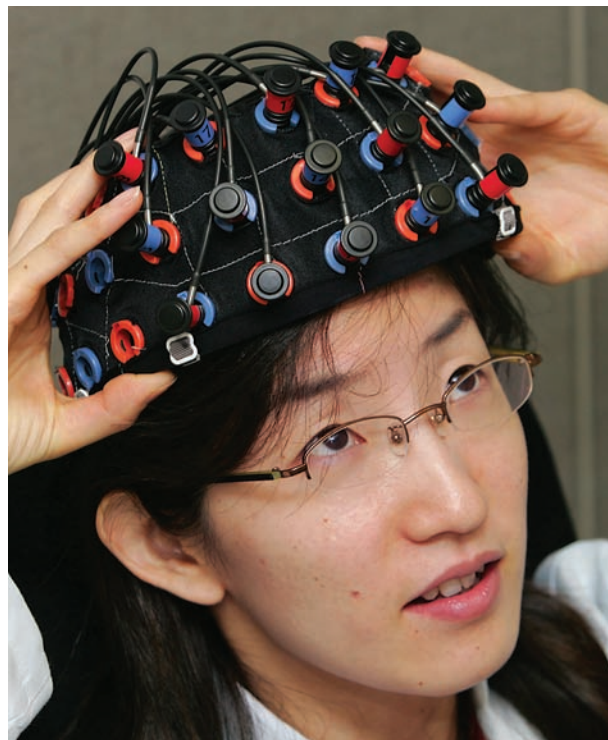
Developed by Hitachi, this brain-machine interface analyzes slight changes in the brain's blood flow and translates them into electric signals, allowing the device's user to control everyday objects without lifting a finger.

well as injury. As in many engineering situations, the name of the game is trade-off. Proponents of the noninvasive approach are constantly improving their signal-processing software to better extract every bit of information from the signals they collect. At the same time, those who favor microelectrodes are trying to lessen their impact by improving the electrode-tissue interface. Cyberkinetics Neurotechnology Systems of Foxborough, Mass., has developed a device that inserts an array of microelectrodes quickly. The procedure reduces tissue trauma because of the viscoelastic nature of neural tissue—that is, its ability to recover from mechanical stresses, provided they are of short duration.

Another method of accessing the brain's neural signals falls between those two. Sanchez's group is experimenting with an electrocorticographic (ECoG) technique that places an array of small electrodes on the cortex, each of which

aggregates signals from a large number of neurons—many more than a microelectrode does but significantly fewer than an external electrode. Moreover, since the signals need not pass through the membrane surrounding the brain cortex, the skull, or the scalp before being sensed, ECoG signals suffer much less attenuation than EEG signals and exhibit a higher signal-to-noise ratio.

LESS POWER Minimizing power consumption is another major issue with BMI. Any permanently implantable device needs amplifiers, signal-processing circuitry, and a wireless transmitter. Therefore, using as little power as possible to minimize the heating of tissue and to prolong battery life is another important goal. One way is to minimize the bandwidth occupied by the data being sent from the implanted device to the outside world. Pursuing that goal, Member John G. Harris, a professor of electrical and computer engineering at the University of Florida, came up with a sampling scheme that samples more rapidly when the signal amplitude is large and more slowly when it is small. Since neurological signals are spike trains with a high amplitude only a small part of the time, that saves a lot of bandwidth. The price paid is a complex reconstruction algorithm performed in circuitry outside the body—where power limitations do not apply.

A team at Stanford University came up with a scheme that combines a variable-precision analog-to-digital converter with a spike-sorting subsystem that samples the neurological signal only when a spike is present and varies its resolution from 3 to 8 bits, depending on the quality of the signal. IEEE Student Member Michael D. Linderman, who is part of the Stanford team, says the subsystem can be trained by the signal shapes to identify individual neurons whose signals are picked up by the same electrode. That information is enough for the complex decoding algorithms to analyze and determine what action the person intends to take. BMI researchers are optimistic because, as Linderman and his colleagues explain in "Signal Processing Challenges for Neural Prostheses" [*IEEE Signal Processing Magazine,* January 2008], "many of the obstacles facing the prosthetics community as it develops a clinically viable implantable prosthetic processor are primarily engineering challenges." ∎

Q&A With Kam and Ray

BY ANNA BOGDANOWICZ

Each June *The Institute* profiles the IEEE President-Elect candidates to introduce them to our readers. Typically we cover their biographies, particularly their professional careers and history with IEEE. But this time, *The Institute* wanted to learn about the more personal sides of Moshe Kam and Pedro Ray, including their hobbies, hidden talents, and favorite memories. We'll cover their stance on various IEEE issues in our annual coverage of the questions and answers from Candidates Night in the September issue. First, however, let's start with the basics.

Born in Jaffa, Israel, IEEE Fellow **Moshe Kam** is head of the electrical and computer engineering department at Drexel University, in Philadelphia. He has taught and conducted research in detection, estimation, robotics, and control at Drexel since 1986, and he founded the university's Data Fusion Laboratory. IEEE's vice president of Educational Activities from 2005 to 2007, Kam decided to run for President-Elect because "IEEE faces considerable challenges and opportunities, and I hope that my experience as a long-time volunteer will help IEEE meet these challenges wisely and energetically."

Pedro Ray, a senior member born in Havana, is president of Ray Engineers, one of the largest engineering design firms in Puerto Rico. He is also owner and president of several companies dedicated to the development of commercial and residential real estate. He was IEEE's vice president of Regional Activities (now known as Member and Geographic Activities) in 2006 and 2007. A candidate in last year's election, Ray decided to try once more because "a lot of good friends persuaded me to run again. I came in second. Hopefully this year I'll win."
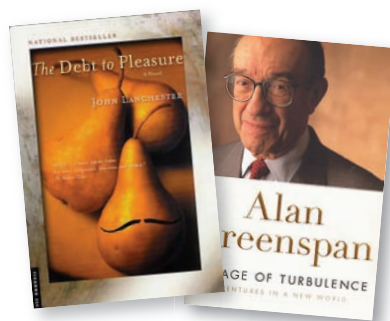
FAVORITE BOOK
KAM: *The Debt to Pleasure*, by John Lanchester.
RAY: Nonfiction books about business and politics, such as *The Age of Turbulence: Adventures in a New World*, by Alan Greenspan.

### WHY DO YOU RENEW YOUR IEEE MEMBERSHIP EACH YEAR?
KAM: IEEE is the most important, interesting, and influential association of electrical and computer engineers, as well as of other professionals such as computer scientists, biomedical engineers, and physicists. The information and networking benefits that I get make the membership dues seem very inexpensive.
RAY: I enjoy the people, and I like being part of the IEEE community. I cherish the relationships I have built with other members. Being an active member also is a way of giving back to society.

THINGS YOU ENJOY DOING ON THE WEEKEND
RAY: Spending quality time with family and friends.
KAM: Going to used-book shops. Every visit yields another find. Although, after discovering I own all four translations of *Fathers and Sons,* there is now a temporary moratorium on Ivan Turgenev.
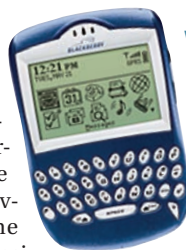
WHAT GADGET CAN'T YOU LIVE WITHOUT?
RAY: My BlackBerry. I can't leave home without it.
KAM: The picture-in-picture feature of some television receivers. It makes watching so much more efficient.

DO YOU HAVE A MOTTO?
KAM: Mine was spoken in 1857 by a George Eliot protagonist: "Any coward can fight a battle when he's sure of winning; but give me the man who has pluck to fight when he's sure of losing. That's my way, sir; and there are many victories worse than a defeat."
RAY: Honesty, hard work, and perseverance—if you apply all three, you will succeed no matter what.

MOST MEMORABLE IEEE EVENT
KAM: In 2007, the Educational Activities Board brought together more than 100 leaders of student branches from six countries for two days of training in Piura, Peru, on how to work with middle-school and high-school teachers. When I saw the sea of enthusiastic young volunteers eager to help with preuniversity engineering education, I could not be prouder—of them, of the EAB, and of IEEE.
RAY: Each of the IEEE honors ceremonies. Seeing all those visionaries is the most humbling experience and makes me feel very small. You think you've accomplished a lot until you see what they've done. It makes me very proud of IEEE.

FAVORITE VACATION SPOT
RAY: Virgin Gorda, British Virgin Islands.
KAM: Montreal.

WHAT DO YOU ENJOY MOST ABOUT YOUR JOB?
RAY: Seeing the results of my hard work. I'm in a creative field, and when we set out to build something it's very rewarding when we finally see the finished product.
KAM: A student or a colleague telling me how a class I taught or an activity I organized positively affected this person's life. An engineer I met recently in San Diego told me how a conference I organized in 1987 persuaded him to change his field of interest, go back to school, and start a small company. That company is not small anymore; today it employs more than 200 people and does innovative work for federal agencies and private clients. I live for such moments.

IF YOU WEREN'T AN ENGINEER, WHAT WOULD YOU BE?
KAM: A chemist, because chemistry was my second favorite subject in high school.
RAY: A doctor, because it's another profession that helps society.

Walton's *Belshazzar's Feast* in 2000 in Philadelphia. It was the most intense and exhilarating public event in which I have ever participated. Everybody—the chorus, conductor, audience, and even the ushers—was deeply moved.

HOBBIES
RAY: Skiing and yachting. There's nowhere to ski where I live, so I travel to Colorado. I love doing the double-diamond courses [the most difficult]. Being surrounded by the fresh air up in the mountains is great. With yachting, I love the feeling of the sea and being surrounded by nature.

KAM: Music, especially choral music. I sing second bass with the Mendelssohn Club, a Philadelphia chorus I joined about a decade ago. Before that I sang with the Choral Arts Society of Philadelphia. Both groups are dedicated to the art of choral singing and also serve as preservers of important cultural heritage. I remember in particular a performance of

WHAT WERE YOU LIKE AS A CHILD?
KAM: A habitual reader who devoured whole libraries of novels, dictionaries, encyclopedias, poetry, and history books during every waking moment. I was happiest when I was home sick from school and could spend time in my parents' library.

RAY: I was very shy and fascinated by math. However, I've changed through the years, and I'm not so shy anymore; I'm an explorer. I've dedicated my life to traveling the world to immerse myself in other cultures. My next trip, to Africa, will be to donate supplies for clean drinking water.

WHAT'S THE MOST CHALLENGING IEEE PROJECT OR ISSUE YOU HAVE TACKLED?
KAM: Without a doubt, getting www.TryEngineering.org online. It is a multilingual portal for young people (ages 8 to 18) and their teachers, school counselors, and parents that IEEE created with the help of IBM and the New York Hall of Science. The portal introduces them to engineering and aims to motivate students to consider it as a career.

The project was expensive and complicated because it had to serve many different school systems and offer multiple languages, while being attractive to the target audience. The volunteers and staff members who worked on the project had to raise a lot of money, work with many organizations, develop and adapt large volumes of high-quality content, and move it all from concept to launch in nine months.

The portal attracts more than 60 000 visitors each month and is considered [by many educational organizations] to be the premier preuniversity engineering portal online.

RAY: When I became treasurer in 2003, IEEE had gone through two years of financial losses, so we were really in the hole. My goal was to turn that situation around. The first meeting on the finances was very tough because I had to convince everyone that we could do it. And I was this young new guy trying to make everyone listen to me. But I got their attention. I was very strict and asked everyone to cut back their groups' spending. It worked in the end. In my two years as treasurer I added US $40 million in reserves, and our budget was balanced.

HIDDEN TALENT
KAM: Writing poetry. I published some poems years ago and am still working on poetry translations, mostly of Walt Whitman.

RAY: Playing basketball. I don't want to sound like a pro, but if anyone wants to challenge me, I'll be glad to go one-on-one! ■

Wherever Life Moves You
IEEE Has You Covered

2008 Class of Fellows Makes History BY KATHY KOWALENKO

Congratulations to the 27 women named IEEE Fellow this year. It's the highest number of women elevated to that prestigious membership grade in a single year since IEEE was established.

Four of the Fellows have something in common: they're inventors elevated in the Fellow program's research engineer/scientist category, and three of them work in industry. Janet Jackel, Radia Perlman, Keyue Smedley, and Jinyun Zhang all hold patents for groundbreaking work.

OPTICAL WHIZ Jackel, a researcher with Telcordia Technologies in Red Bank, N.J., whose career spans more than 30 years, was elevated to Fellow for her contributions to optical communications.

One of her early inventions was a method for creating optical waveguides on lithium niobate, a crystal material that can be used to make fast optical modulators and switches. Typically, waveguides are created by high-temperature diffusion of titanium patterns into the crystal. Back in 1980, Jackel, along with coinventor Catherine Rice, found an alternative, lower-temperature method when they discovered that protons (hydrogen ions) from molten materials could move quickly into the lithium niobate crystal. That also caused the waveguides to carry the light of only one polarization instead of the typical two—which turned out to be a useful complement to the older method, Jackel says. Today her proton exchange method is used to enhance the function of the titanium-diffused waveguides.

INTERNET INNOVATOR Perlman, a specialist in network and security protocols for Sun Microsystems in Sammamish, Wash., was elevated for her work in the field. Also a Sun Fellow, she is sometimes referred to as the "mother of the Internet" thanks to her invention of the spanning tree algorithm, the key to network bridging and switches. The algorithm is also essential to the wireless IEEE Std. 802.1d. Her Ph.D. thesis on routing in the pres-

Janet Jackel

ence of malicious failures remains the most important work in routing security. Her other contributions dealt with credentials download, strong password protocols, and efficient certification revocation. She holds more than 90 patents and was named by *Network World* and *Data Communications* magazines as one of 20 people who have most changed the industry.

POWER PRO Smedley was recognized for her work in high-performance switching power converters. She invented the one-cycle control (OCC) method for switching power converters, used today in high-power rectification, active harmonic filtering, and VAR generation essential for modernizing the power grid, as well as in professional audio amplifiers. Smedley, a professor of electrical engineering and computer science at the University of California, Irvine, is director of the university's Power Electronics Laboratory.

Before Smedley's invention, the control of switching-mode converters was more complex. She took advantage of the nonlinear feature of a switching circuit to develop more stable, faster, and accurate converters. The complexity of three-phase power converters was reduced about tenfold and the size and weight of the amplifiers nearly sevenfold, while performance and efficiency were substantially improved. Things also got quieter.

"The noise you hear in a switching-mode amplifier is not enjoyable,

Keyue Smedley

and OCC had the speed to take that noise out," she says. "It was a perfect marriage when OCC met the switching circuit."

Smedley's work also led to new applications in transportation, power electronics, renewable energy generation, and the dynamic control of power grids.

WIRELESS WONDER Zhang was recognized for contributions to broadband wireless transmission and networking technology. A group manager of digital communications at Mitsubishi Electric Research Laboratories, in Cambridge, Mass., she is credited with developing ultrawideband (UWB) technology for home entertainment networks. She played a pivotal role in developing several high-profile UWB standards, in particular IEEE Std. 802.15.3a and IEEE Std. 802.15.4a. She also pioneered the development of ad hoc networking and routing technology and the ZigBee standard for low-power, low-cost, self-organizing, and self-healing networks.

If you know of an IEEE senior member—female or male—doing outstanding work as an application engineer/practitioner, educator, research engineer/scientist, or technical leader, it's not too early to consider nominating that person for Fellow for the class of 2010. The deadline for nominations is 1 March 2009. ∎

FOR MORE INFORMATION, go to http://www.ieee.org/fellow.

OPINIONS

MARKETPLACE OF IDEAS

THIS MONTH'S QUESTION

Who's to Blame—You or Your ISP?

To curb piracy, the UK government is forcing Internet service providers to take responsibility for their clients' illegal downloads of music and movies. ISPs must apply antipiracy software voluntarily by April or British officials say they will impose sanctions. The ultimatum comes after years of pressure by media companies to target ISPs—rather than individuals—for illegal downloads. The service providers argue that they should serve merely as data relays, not as monitors, for what passes over their networks.

SHOULD ISPS, NOT THEIR CUSTOMERS, BE RESPONSIBLE FOR ILLEGAL DOWNLOADS?

MAIL: *The Institute,* IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08855-1331 USA
FAX: +1 732 235 1626 **E-MAIL:** institute@ieee.org

RESPOND TO THIS QUESTION by e-mail or regular mail. Space may not permit publication of all responses, but we'll try to draw a representative sample. Responses will appear in the September issue of The Institute and may be edited for brevity. Suggestions for questions are welcome.

RESPONSES TO MARCH'S QUESTION

Would you want your employer to adopt a quiet time like Intel's?

To be more productive, a group of engineers and managers at Intel Corp. has adopted a "quiet time" to eliminate office distractions. On Tuesday mornings they turn off their e-mail, forward calls to voice mail, decline all meetings, and hang a "Do not disturb" sign on their doors. Some say that a steady barrage of e-mail and phone calls hinders the ability to focus on work that requires creativity and analysis. But others argue that it's vital to respond promptly to co-workers' requests for information so that they can get the answers they need.

Make Your Own Rules

Once every two weeks or so, I institute my own quiet time by turning off my e-mail and phone. I limit the quiet time to no more than four hours so I can respond to phone calls the same day. Instead of a company instituting an official quiet time, an atmosphere supportive of the concept would be more helpful. This way I can have the quiet time when I really need it.

NANCY GUNDERSON
Raleigh, N.C.

Inconsiderate

Sometimes quiet time is necessary to complete a task that requires concentration. But shutting people out is inconvenient for them and perhaps inconsiderate. Employees should choose a time to keep their office quiet, possibly early in the morning.

RICHARD VAN LEEUWEN
West Vancouver, B.C., Canada

Concentration Needed

Intel's one morning a week is a good start. Quiet time is absolutely indispensable to creative thinking. If colleagues need an answer, it can wait until the afternoon, and they can use that time for some creative thinking of their own.

FRED BROOKS
Chapel Hill, N.C.

Spamalot

I would definitely vote for having quiet time away from the everyday barrage of internal spamlike e-mail that hinders productivity. However, those messages would still build up during quiet time, and you'd have to handle them eventually.

A better solution would be to change the implementation of internal mailing lists, which are at least 90 percent spam. It's quite common to dedicate up to half of each day going through internal e-mail spam just so you don't miss the 10 percent that's actually useful for your job.

ALAN CHOU
San Jose, Calif.

Going Too Far

Although I believe that time without meetings can be valuable, I think an enforced quiet time with no phone calls or e-mail is going too far. Engineers do not work in a vacuum; their jobs are fundamentally collaborative. If you are answering colleagues' questions, your individual tasks may not be progressing, but the tasks of your group or company are moving ahead.

JIM BABKA
Austin, Texas

No Distractions, Please

There need to be times when there are no distractions. But there's a need to respond to people, and this limits quiet times. I often work best when I have the time to think something through thoroughly rather than being interrupted to respond to inquiries.

ALEXANDER KRAUSKA
Wichita, Kan.

Hey, Cool It!

We need quiet time to be more productive, but I don't think my employer should adopt an official quiet time. We tend to disturb others for every little obstacle in our paths when we can answer many questions ourselves. We should disturb others only when we really need to.

On the other hand, we don't have to respond promptly to every message we receive. We should respond only to those that really merit immediate attention. For instance, we can set up auto-reply messages when we can't respond to e-mail right away. We can turn down the volume of the phone ring and screen phone calls.

Little by little, perhaps people will start to contact and distract us only when it really matters.

JULIO MENDOZA-MEDINA
Frankfort, Ky.

Silence Is Scarce

Quiet time is a great idea. I work in a sea of cubicles, and it's virtually impossible to have any quiet time to concentrate on anything. Between the conversations and phone calls of people around me and the barrage of e-mail (mostly spam), I don't know how anything gets accomplished.

MIKE SPECINER
Acton, Mass.

Let It Ring

Quiet time would really help get some productive work done. It takes a significant amount of time without interruptions to do research.

While it's not particularly sanctioned by my company, I occasionally turn off my e-mail and phone. Although e-mail can be helpful when working on a group project, the sheer volume of it is overwhelming at times. People shouldn't expect an immediate response to e-mail.

ROBERT HIGGINS
Seattle

Where's the Fire?

Intel's move is not a bad idea. It allows workers to have the time to focus on important items once a week. Sometimes it's vital to respond to others quickly, but this tends to cause chaos once customers or colleagues get used to it. If your problem can't wait for three hours once during the week, you probably need the fire brigade instead.

OLIVIER GAUTHEROT
Santiago, Chile

A Model Global Association

In recent months, our objective to make IEEE a truly global organization has taken on a new emphasis. The enterprise-wide strategic planning process begun in early 2007—the IEEE Envisioned Future—has enabled us to agree upon a new, twofold vision statement: "To be essential to the global technical community and to technology professionals everywhere, and to be universally recognized for the contributions of technology and of technical professionals in improving global conditions."

To accomplish this, the Board of Directors has set a three- to five-year goal for our organization "to operate as a model global association" that reflects country-based needs and sensitivities and geographically representative governance. An ad hoc committee established earlier this year is gathering data on our current performance in these matters. After the data are analyzed, the group will develop short- and long-term recommendations for the board.

But while discussing what IEEE must do to realize the goal of becoming a model global organization, we have come to understand that IEEE already reflects many characteristics of such an association.

■ **Our organization serves** more than 375 000 members in over 160 countries, with 43.5 percent located in Regions 7 to 10 (Canada; Europe, the Middle East, Africa; Latin America; Asia and the Pacific). In a trend that began in the early 1990s, Regions 8, 9, and 10 are growing at an especially rapid pace.

■ **Each year, IEEE** sponsors or cosponsors more than 850 conferences worldwide. At present, more than 40 percent of them are in Regions 7 to 10.

■ **We have cooperative** agreements with more than 70 national societies in 40 countries to enhance the professional growth of those countries' engineers and technical communities. Many IEEE societies also have separate agreements with national societies and industry associations that promote additional joint activities in specific disciplines.

■ **IEEE's publication activities** are globally renowned; we publish 30 percent of the world's literature in our fields of interest. In 2007 more than 68 percent of the authors whose papers were published in IEEE publications were from Regions 7 to 10.

■ **Users of IEEE Xplore** worldwide downloaded more than 74 million full-text PDF documents in 2007, an average of 6.2 million documents monthly.

■ **TryEngineering.org** (www.tryengineering.org), a Web site designed to attract preuniversity students to engineering and technology, features a search tool that pinpoints accredited engineering programs in 23 countries. The site is available in seven languages, including Chinese, Japanese, and Russian.

■ **Hundreds of IEEE** members around the world are participating in the IEEE Teacher In-Service Program (TISP). Through their local sections, they develop and present technology-related topics to preuniversity teachers. Members have organized TISP workshops in Colombia, Ecuador, Malaysia, Peru, and South Africa, with more countries to be included this year.

■ **IEEE is expanding** its global activities in accreditation—agreed-upon educational standards—to include university engineering programs in China, Peru, and the West Indies. In 2007, IEEE and the China Association for Science and Technology cosponsored a workshop attended by 52 representatives from Chinese technical associations, universities, companies, and the national engineering education accreditation committee.

These are just a few examples of how IEEE is working to be a model global organization. But we need to accomplish much more, especially in making more services relevant to members and to enable all regions to participate in governance, especially on the IEEE Board of Directors. This year, only eight out of 31 board members are from Regions 7 to 10. We must also address such difficult issues as how to operate globally with limited resources, overcome the barriers to membership for people outside the English-speaking world, and become an internationally recognized force for technical professionals.

We need your ideas on how to achieve these ambitious but attainable goals. Send me your thoughts at terman.column@ieee.org.

Lewis Terman

Lewis Terman
IEEE President and CEO

MICHAEL A. ROBINSON

FEATURED CONFERENCE

IEEE Autotestcon

Salt Lake City, 8–11 September

Billed as the only conference in the world focused primarily on automated testing technology for military, government, and aerospace applications, Autotestcon has been an annual event since 1965.

This year's theme is system readiness. The conference features papers on diagnostics, instrumentation, logistics, and verification of automated and computer-controlled test systems and software. Attendees, who can browse more than 250 exhibits set up by over 100 companies and U.S. military groups, have opportunities to interact with acquisition officials, engineers, logistics experts, and weapons systems managers.

Social activities include a golf tournament on 8 September and a dinner on 10 September.

SPONSORS: IEEE Aerospace and Electronics Systems Society, IEEE Instrumentation and Measurement Society
VISIT: http://www.autotestcon.com

International Power Electronics and Motion Control Conference

Poznan, Poland
1–3 September

Researchers and industry experts are prepared to discuss a broad range of applications for power electronics and motion control. Topics include electromagnetic compatibility, power converters, robotics, and semiconductor devices and packaging.
SPONSORS: Association of Polish Engineers, IEEE Industrial Electronics Society, IEEE Poland Section, IEEE Power Electronics Society, Institute of Electrical Engineers of Japan, Korean Institute of Power Electronics
VISIT: http://www.epe-pemc 2008.put.poznan.pl

International Conference on Pervasive Computing and Applications

Alexandria, Egypt
6–8 October

The third annual conference aims to explore theoretical and practical applications of pervasive computing, the use of computers in automobiles, consumer appliances, and other everyday items. Researchers plan to discuss mobile computers, including wearable ones, and wireless networks.
SPONSORS: Beijing University of Posts and Telecommunications, Birmingham City University, Guilin University of Electronic Technology, IEEE United Kingdom and Republic of Ireland Section
VISIT: http://www.icpca.bcu.ac.uk

IEEE International Midwest Symposium on Circuits and Systems

Knoxville, Tenn.
9–13 August

The symposium features sessions and tutorials on the application, design, and theory of electronic systems. Topics include digital signal processing, microwave and digital circuits, neural networks, and fuzzy systems. Keynote speakers are IEEE senior members Paul Hasler, founder of the Georgia Institute of Technology's Integrated Computational Electronics Laboratory, and Benjamin Arizi, a communications theory expert.
SPONSOR: IEEE Circuits and Systems Society
VISIT: http://www.ece.utk. edu/mwscas

IEEE International Conference on Electronics, Circuits, and Systems

St. Julian's, Malta
31 August–3 September

The 15th annual conference covers design methodologies, techniques, and experimental results in emerging electronics, circuits, and systems. Topics include analog circuits and signal processing, computational methods and optimization, digital signal processing, neural network systems, photonic and optoelectronic circuits, RF and wireless circuits and systems, and VLSI.
SPONSORS: IEEE Circuits and Systems Society, University of Malta
VISIT: http://www.icecs2008.org

IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications

Cannes, France
15–18 September

"Sensing the Future" is the theme of the 19th annual symposium, which is one of the world's foremost conferences covering wireless research and telecommunications.

Topics include adaptive source coding, antenna and RF components, cognitive radio, handset design and low-power circuits, and vehicular communications and networks.
SPONSORS: IEEE Communications Society, La Société de l'Électricité et de l'Électronique
VISIT: http://www.pimrc2008.org

IEEE Nuclear Science Symposium and Medical Imaging Conference

Dresden, Germany
18–25 October

Papers presented at this annual conference address detector materials, image-reconstruction algorithms, and radiation detector and imaging systems and their applications in biology, material science, medicine, and physics. Included is the International Workshop on Room Temperature Semiconductor X- and Gamma-Ray Detectors.

Tours will be given of Dresden and nearby cities.
SPONSORS: Forschungszentrum Dresden, IEEE Nuclear and Plasma Sciences Society
VISIT: http://www.nss-mic.org
—compiled by Amanda Davis

New Online Directory Opens Doors to Networking

IEEE MEMBERNET

http://www.ieee.org/web/membership/memberNet.html

It's not quite Facebook, but a new online directory will let members discover IEEE colleagues they may not know but with whom they share a common interest. Want to know who in IEEE works with microelectromechanical systems? How about people in your section who are broadcast engineers or alumni of your university?

Being able to find and connect with other industry professionals is one of the key reasons people join IEEE. And with the new IEEE memberNet, members will be able to pinpoint people according to such criteria as technical interest, geographic region, and society membership. The network is available only to IEEE members at no charge.

"This is the first step in a series of new online tools that will enable our members to connect and collaborate virtually," says Joe Lillie, vice president of IEEE Member and Geographic Activities, which developed the new service. "Members can now discover other members with similar technical and engineering interests—regardless of geography."

GETTING STARTED The first step to using IEEE memberNet is to log into myIEEE (http://www.ieee.org/myieee) with your IEEE Web account. Next, you opt in to the system through the My Opt-In Preference link, which takes you to a page in myAccount where you can choose the information from your member profile that you want to display. Put a check next to what you want to share (see "Opting In to IEEE MemberNet"). Once you've saved your check marks, memberNet gets updated in real time, so the information is as current as you want it to be. You can open memberNet by clicking on Launch the Network in myIEEE. MemberNet also creates networks for you with others who have common interests, in the myNetworks area.

You can search for individuals by entering their first and last names at the initial memberNet screen or in the myNetworks section. MyNetworks also has a search tool to find people whose names you don't know. For example, you can find all the senior members in the Korea Section who belong to the IEEE Consumer Electronics Society and whose technical interest is telecommunications. Or you can look for members in Detroit who work for the auto industry.

The success of IEEE memberNet will be driven by member participation, Lillie says: "The full value depends on the willingness of IEEE members to opt in and display information from their member profiles."

—*Adrienne Hahn*

Opting In to IEEE MemberNet

Help others with common interests find you by joining memberNet. Just check the boxes next to the information you'd like to share from your member profile. This is information that you have already given to IEEE:
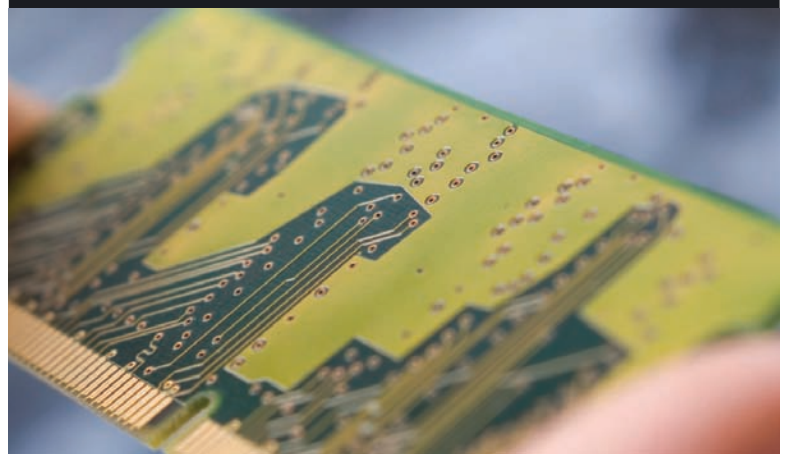
- Technical interest
- Memberships
- Location
- Education
- Mailing address
- Phone number
- E-mail address
- Instant messaging address
- Employer
- Awards
- Biography

Spotlight On Three Products

IEEE Std. 1636.1-2007, released in February

The IEEE Trial-Use Standard for Software Interface for Maintenance Information Collection and Analysis: Exchanging Test Results and Session Information via the eXtensible Markup Language defines the functions that intelligent substation electronics need to perform in order to run critical infrastructure-protection programs. The standard covers how to securely access, operate, configure, and revise firmware and retrieve data from such devices.

IEEE Std. C37.235 2007, released in January

The IEEE Guide for the Application of Rogowski Coils (RCs) Used for Protective Relaying Purposes establishes the criteria for applying all types of the coils in electric power systems. It is intended to help relay application engineers select and apply RCs for protective relaying.

The standard also presents the requirements for the performance, operation, testing, safety, and maintenance of RC-based current sensors.

2008 National Electrical Code Handbook, released in January

The *NEC Handbook* is a handy reference for complying with the 2008 National Electrical Code, released in September. From the National Fire Protection Association, the handbook features electrical safety information for electrical contractors, engineers, electricians, safety officials, inspectors, and architects. It includes expert commentary from code specialists, who offer insight into the rationale behind the code, explanations of new and revised rules, and practical advice on applying the code.

The handbook has more than 500 diagrams, photos, tables, and charts and also includes summaries of key changes in the 2008 code.

FOR MORE INFORMATION on these and other IEEE standards, visit the IEEE Standards Association Web site at http://www.standards.ieee.org.

IEEE Educational Partners Program

Microelectronics, structural engineering, and renewable energy are among the subjects covered in courses offered by these four partners of the IEEE EPP. Depending on the partner, classes, seminars, and graduate-degree programs are available online, on campus, or on DVDs at a discount of up to 10 percent.

Auburn University: Courses available online and on DVDs cover topics in civil, electrical, and structural engineering; management; electric power systems; lighting design; and surveying.

Knowledge Master Inc.: Twenty-six online courses given in English or Mandarin Chinese cover microelectronics, semiconductor devices, digital ICs, and CMOS analog IC design.

SQE Training: On-site training, online courses, and certificate programs on software design, programming, testing, development, and management.

Willis College: Online courses and certificate programs on business, e-business, clean/renewable energy, and information technology.

FOR MORE INFORMATION on these or other EPP partners, visit http://www.ieee.org/partners.

PEOPLE

PROFILE
PART-TIME PASSIONS
RECOGNITIONS
IN MEMORIAM

PROFILE

GREG ALLAN

The Cable Guy To the Rescue

NASA and businesses call him to troubleshoot wiring mysteries

BY SUSAN KARLIN

When NASA scrapped two Atlantis shuttle launches in December because of faulty fuel sensors, IEEE Member Greg Allan was the guy on speed dial.

Arriving at the Kennedy Space Center in Florida, Allan diagnosed the problem with a portable time domain reflectometer (TDR), a device that sends a high-frequency pulse down a cable, captures the electromagnetic reflections, and analyzes the waveform to determine the nature and location of a fault.

"The shuttle fuel sensors are like gas gauges in your car," he says. "When the tanks were filled with liquid nitrogen, everything was okay for 10 minutes before the sensors suddenly registered empty. The TDR trace registered an open circuit at a connector where wiring passed from outside to inside the tanks."

It turned out that the sensor manufacturer had made a change in the design it thought wasn't significant. NASA solved the problem by hard-wiring the sensors to bypass the connector.

The news of Allan's help in solving the problem made the local newspapers in his quiet Pittsburgh suburb. "It was one of the first few occasions when my kids were able to understand what I do," he says.

Allan, 45, is technical director for CM Technologies, in Coraopolis, Pa., a manufacturer of instruments that help diagnose problems in electrical cable wiring. NASA is its most high-profile client, but CM also services some 30 to 40 nuclear power plants, as well as military and commercial aircraft and Navy submarines.

KEEPING UP TO DATE "Wiring problems are our specialty," Allan says. "Our expertise is providing instrumentation and services to diagnose problems in wiring and electrical cable." While TDR technology has been around since the 1950s, CM Technologies recently carved out a niche with proprietary credit card–size devices that plug into computers and PDAs, giving them TDR capability—which allows for testing, troubleshooting, and waveform interpretation.

CM has sold units to the Johnson Space Center, in Houston, for the space station; to a doctor in India researching waveform differences in healthy and cancerous cells; to Colgate-Palmolive for research in diagnosing problems in teeth; and to geologists monitoring earth movements in mines. On the services side, Allan helped investigate the 2006 Con Edison Indian Point power plant shutdown in New York that caused a blackout in Manhattan.

"The high-profile things are interesting in that you're able to say, 'Hey, I was there,'" he says. "But ultimately it's about solving a puzzle—and the thrill of being correct."

Allan grew up in Venetia, Pa., and got his first taste of computer programming on the Radio Shack TRS-80 in high school. He initially intended to become a software programmer when he entered Ohio Northern University, in Ada, until a growing interest in his lab work lured him to engineering. He earned a bachelor's degree in electrical engineering in 1985.

"In college, we were encouraged to join IEEE as a way of becoming aware of what's going on in industry, and being a member indicates on job interviews that you're serious about engineering as a career," he says.

He continues to be a member to keep his skills current through self-study courses, society membership, and publications, he says.

AIR FORCE ROOTS He began his career as a civilian electronics engineer for the U.S. Air Force, writing programs for testing avionics equipment and at the same time earning a master's degree in electrical engineering from Mercer University, in Macon, Ga. He joined CM Technologies in 1991.

The company was born in 1984 when founder Sheldon Lefkowitz, a mechanical engineer, was hired to investigate a power failure at the San Onofre Nuclear Generating Station near San Clemente, Calif. Lefkowitz found that the insulation surrounding an electrical cable routed near a steam pipe had eroded; the cable had touched the pipe and caused a short circuit. As part of a return-to-service agreement, the plant implemented a cable-monitoring program and put Lefkowitz and his staff on retainer.

The aviation industry tapped the firm's expertise after two high-profile commercial airline crashes jolted the Federal Aviation Administration, NASA, and the U.S. military into addressing old wiring.

In 1996, TWA Flight 800 exploded en route from New York to Paris, killing all 230 aboard when a frayed wire touching the fuselage caused a short circuit. Two years later, deteriorating in-flight entertainment-system wires caused a fire on Swiss Air Flight 111, which crashed off the coast of Nova Scotia, killing 229.

"Until that point, wiring in commercial aviation had been ignored," Allan says. "Companies are often not set up to maintain these things.

"Nuclear utilities are our biggest customers because they have required maintenance programs. Let's face it—if a pump in a cookie plant fails, it's not going to have the same repercussions." ∎

Allan with the instrument he used to diagnose faulty fuel sensors for NASA.

PAM PANCHAK/PITTSBURGH POST-GAZETTE

David Bassett
Reviving Classic Cars

It was a sad day for IEEE Member David Bassett when he traded in the Signal Flare Red 1966 Ford Mustang he drove in college for a larger car to hold his family. "I loved that car," Bassett says, recalling its black vinyl roof and killer engine. He vowed someday to acquire another. Nine years later, in 1980, he got his chance: he bought his mother's 1969 Mustang, repaired it, souped it up, and found a new hobby: restoring classic Mustangs. "That was the start of my hobby," Bassett says. "I still have that car, and it has only 52 000 miles [84 000 kilometers] on it!"

Since 1980, Bassett, 58, has bought, restored, and sold several old Mustangs, doing all the repairs himself. Employed by PPL Electric Utilities, in Allentown, Pa., he learned to fix cars in college while studying electrical engineering. Several of his engineering classes covered strength of materials, hydraulics, and physics, which Bassett credits for helping him understand how to do just about everything: fix car frames, remove rust, weld, rebuild engines and manual transmissions, and replace wiring. "After all, I am an electrical engineer," Bassett says. "My classes gave me a very broad background in engineering that I've turned into a successful career and hobby."

After restoring his mother's car,

PASSION
Restoring Mustangs
PROFESSION
Senior staff engineer/scientist
HOMETOWN
Macungie, Pa.

Bassett took on two 1965 coupes. He offered the cars to his wife, Janyn, as a gift for their 25th wedding anniversary. A Mustang fan herself, she loved the idea. But it took a lot of work before the cars became a worthy present. "It took two years and about a thousand hours to completely restore them," he says.

Bassett has tackled many other Mustangs over the years, but one model stands out: the 1964½ Skylight Blue convertible he bought for his wife. It was going to be her "dream car," but she died shortly after he purchased it. Too grief-stricken to continue working on it, he quit his hobby for two years. He tried to sell the car, but after 18 prospective buyers gave it a thumbs-down, he says he "got the feeling that maybe somebody was telling me I should finish it." Four years of hard work later, he was glad he did.

He's now working on a 1966 Mustang fastback. He plans to paint it pewter with black stripes, just like the car of his dreams: Eleanor, the 1973 Mustang that appeared in the movie *Gone in 60 Seconds*.

"What I love about restoring these cars is that I get to bring back a piece of the past," Bassett says.

He invites readers to e-mail him about their car-restoration experiences: daves64pony@gmail.com.

—Anna Bogdanowicz

Mehmet Vurkaç
Samba Specialist

Growing up in Turkey, Student Member Mehmet Vurkaç loved samba, Brazil's traditional fast-paced, rhythmic style of music and dance. Now he's much more than just a fan. For the past 11 years, Vurkaç, 36, has been singing and playing the drums for several Portland, Ore., samba *baterias* (groups). Some of his bands (the Lions of Batucada and Mais Que Samba) have opened for Aerosmith, Smash Mouth, and other famous rock groups, and their music has been heard on the radio and in concert halls in the United States and Turkey.

Vurkaç (pronounced "Vurkatch") also helps conduct the music. Some samba groups have hundreds of members, and with so many different instruments being played at the same time, it takes several conductors to synchronize everyone. "The underlying structure of the music is subtle, complex, and frequently misunderstood. There are strict rules of rhythmic harmony," Vurkaç says. In fact, he has been analyzing the harmony as part of his doctoral research in computational intelligence at Portland State University. "The two sides of my life—math and music—came together in a meaningful way," he says.

Vurkaç, who uses the stage name Memo Hg, started studying samba when he was an undergrad. Later he took lessons and learned about samba's cultural roots and how to play its traditional instruments, mostly different kinds of drums. A student who had heard Vurkaç was a drummer told him to check out a Lions of Batucada show. Vurkaç did just that, and the band blew him away. "I

PASSION
Performing samba music
PROFESSION
Ph.D. student
HOMETOWN
Portland, Ore.

couldn't believe my eyes that there were so many people in Portland playing this crazy stuff!" he says.

After the show, he waited outside the dressing room to talk to the conductor. "I rattled off as quickly as possible, 'I'm a drummer. Do you need more people?'" Vurkaç recalls. The director asked Vurkaç to come to the next practice, and since then he has played nearly a thousand shows with the band and with other samba groups.
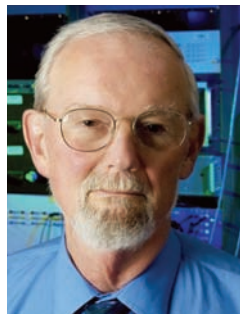
Although he's busy with his Ph.D. research and has taken a leave of absence from his bands, Vurkaç finds ways to pursue his passion. He spends what little extra time he has teaching a beginner's class in samba drumming.

To learn more about the Lions of Batucada and Mais Que Samba, visit http://www.lionsofbatucada.com and http://www.sambadrums.com. *—A.B.*

FELLOW **ARUN PHADKE** and LIFE FELLOW **JAMES THORP**

are corecipients of the Franklin Institute's 2008 Benjamin Franklin Medal in Engineering. They were recognized for pioneering contributions to the development and application of microprocessor controllers in electric power systems, which help prevent blackouts.

The annual Franklin Institute awards honor people "whose great innovation has benefited humanity, advanced science, launched new fields of inquiry, and deepened our understanding of the universe."

Phadke [left] is a professor emeritus of electrical and computer engineering at Virginia Polytechnic Institute and State University (Virginia Tech), in Blacksburg.

He received a bachelor of science degree in 1955 from Agra University (now Dr. Bhim Rao Ambedkar University), in India, and a bachelor's degree in technology in 1959 from the Indian Institute of Technology, in Kharagpur. He went on to earn a master's degree in electrical engineering in 1961 from the Illinois Institute of Technology, in Chicago, and a Ph.D. in 1964 from the University of Wisconsin in Madison.

Thorp is a professor in and head of the department of electrical and computer engineering at Virginia Tech.

He received bachelor's, master's, and doctoral degrees in electrical engineering from Cornell University, in Ithaca, N.Y., in 1959, 1961, and 1962.

MEMBER **KEVIN SHORT**

received a Grammy Award for the Best Historical Album for *The Live Wire: Woody Guthrie in Performance, 1949,* for which he was mastering engineer. Short was presented the award by the Recording Academy in February in Los Angeles at a ceremony held prior to the televised awards show.

Short, a mathematics professor at the University of New Hampshire, in Durham, is credited with developing chaotic compression technology, which uses advanced signal-processing methods and chaos theory to analyze audio, speech, video, and other data. He applied his techniques to interpret and digitize the irregular and broken signal from 1949 wire recordings of a Guthrie concert in Newark, N.J.

Paul Braverman, a college student at the time, had recorded the American folk singer's concert on two spools of wire. In 2001 Braverman sent those spools to the Woody Guthrie Archives in New York City to include in its collection.

Short and a team of sound-restoration experts at Plangent Processes, an audio restoration company in Nantucket, Mass., worked to transfer the recording from the brittle wire to a digital format. The album was released in September 2007.

Short received bachelor's degrees in physics and geological sciences in 1985 from the University of Rochester, in New York. He earned a Ph.D. in physics in 1988 from the Imperial College of Science, Technology and Medicine, in London.

IN MEMORIAM

JENNIFER HOU
Developer of J-Sim
MEMBER GRADE: Fellow
AGE: 43
DIED: 2 December

Jennifer Hou helped develop J-Sim, a reusable component-based, compositional simulation environment built on the notion of the autonomous component programming model. J-Sim (originally known as JavaSim) components can be individually designed, implemented, and tested, and incrementally deployed. A newly elected IEEE Fellow, Hou died of cancer.

She was a principal researcher in networked systems and a director of the Illinois Network Design and Experimentation research group at the University of Illinois, Urbana-Champaign, where she researched the theoretical protocol design and deployment aspects of wireless sensor networks. She and her team of researchers from the school developed J-Sim in 2005.

Hou was an assistant professor in electrical engineering from 1993 to 1996 at the University of Wisconsin, Madison. She left to become an associate EE professor at Ohio State University, Columbus. In 2003 she joined the computer science faculty at the University of Illinois.

One of her many honors was being named an Association for Computing Machinery Distinguished Scientist last year.

Hou earned her bachelor's degree in electrical engineering in 1987 from National Taiwan University. She earned master's degrees in electrical engineering and computer sciences, and industrial and operations engineering, in 1989 and 1991, as well as a Ph.D. in EECS in 1993, all from the University of Michigan, Ann Arbor.

WILLIAM SAYLE
Electrical engineering professor
MEMBER GRADE: Life Fellow
AGE: 66
DIED: 2 February

William Sayle worked at the Georgia Institute of Technology for more than 35 years as a professor and director of the electrical engineering and computer science department.

Sayle began his career in 1965 at Boeing Co., where he researched radiation effects on semiconductor devices. In 1970 he became an assistant professor at Georgia Tech, and in 1988 he took the position of academic administrator, overseeing undergraduate programs in electrical and computer engineering. After his retirement in 2003, he continued to direct undergraduate programs for Georgia Tech Lorraine, in Metz, France.

He made several contributions to engineering accreditation for IEEE and ABET, the organization that accredits university science, engineering, and technology programs. Beginning in 1983, he made more than 20 evaluation visits to engineering schools as an IEEE program evaluator for ABET. He also chaired the IEEE Educational Activities Board Committee on Engineering Accreditation Activities in 1996 and 1997.

He received bachelor's and master's degrees in electrical engineering in 1963 and 1964 from the University of Texas, Austin. He went on to earn a Ph.D. in electrical engineering in 1970 from the University of Washington, Seattle.

HARRY KIHN
Color television pioneer
MEMBER GRADE: Life Fellow
AGE: 96
DIED: 11 February

Harry Kihn worked for RCA Laboratories in Princeton, N.J., for almost 40 years and garnered 27 patents, including one for a key device in color television. In the late 1940s, he and his research staff developed the world's first combined monochrome and color TV receiving system. Named an IEEE History Milestone, it became an international standard and is still used for analog color television. Kihn's patents also include ones for FM altimeters, a monochrome receiver of color TV signals known as Kihn's Kolor Killer, and digital decoder circuits for an early version of a cellphone. He retired in 1977 and became principal of Kihn Associates, an electronics consulting firm.

He earned a bachelor's degree in electrical engineering at Cooper Union, New York City, and his master's in EE from the University of Pennsylvania, Philadelphia.

Donations Hit Foundation High

Contributions to the IEEE Foundation, which distributes funds to improve society's understanding of technology, hit an all-time high of US $2.3 million in 2007, surpassing the $1.4 million given in 2006.

Space constraints prevent listing every donor, but here are those who gave $1000 or more. To learn why some donors give, see "Why We Give."

PRESIDENT'S CIRCLE
($100 000 and up)

- IEEE Circuits and Systems Society
- IEEE Microwave Theory and Techniques Society
- United Engineering Foundation

COUNCIL OF HONOR
($50 000 to $99 999)

- IEEE Geoscience and Remote Sensing Society
- IEEE Power Engineering Society
- Qualcomm Inc.
- James C. Rautio
- Robert and Ruth Halperin Foundation
- The Grainger Foundation
- Kiyo Tomiyasu

BENEFACTOR
($25 000 to $49 999)

- Anonymous*
- Alcatel-Lucent Bell Labs
- IEEE Robotics and Automation Society
- Olga Kirchmayer
- Northrop Grumman Corp.
- Keith R. Schroeder
- The Royal Society of Edinburgh
- Stephen S. and Victoria L. Yau

LEADER
($10 000 to $24 999)

- Paul Baran
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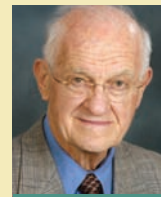
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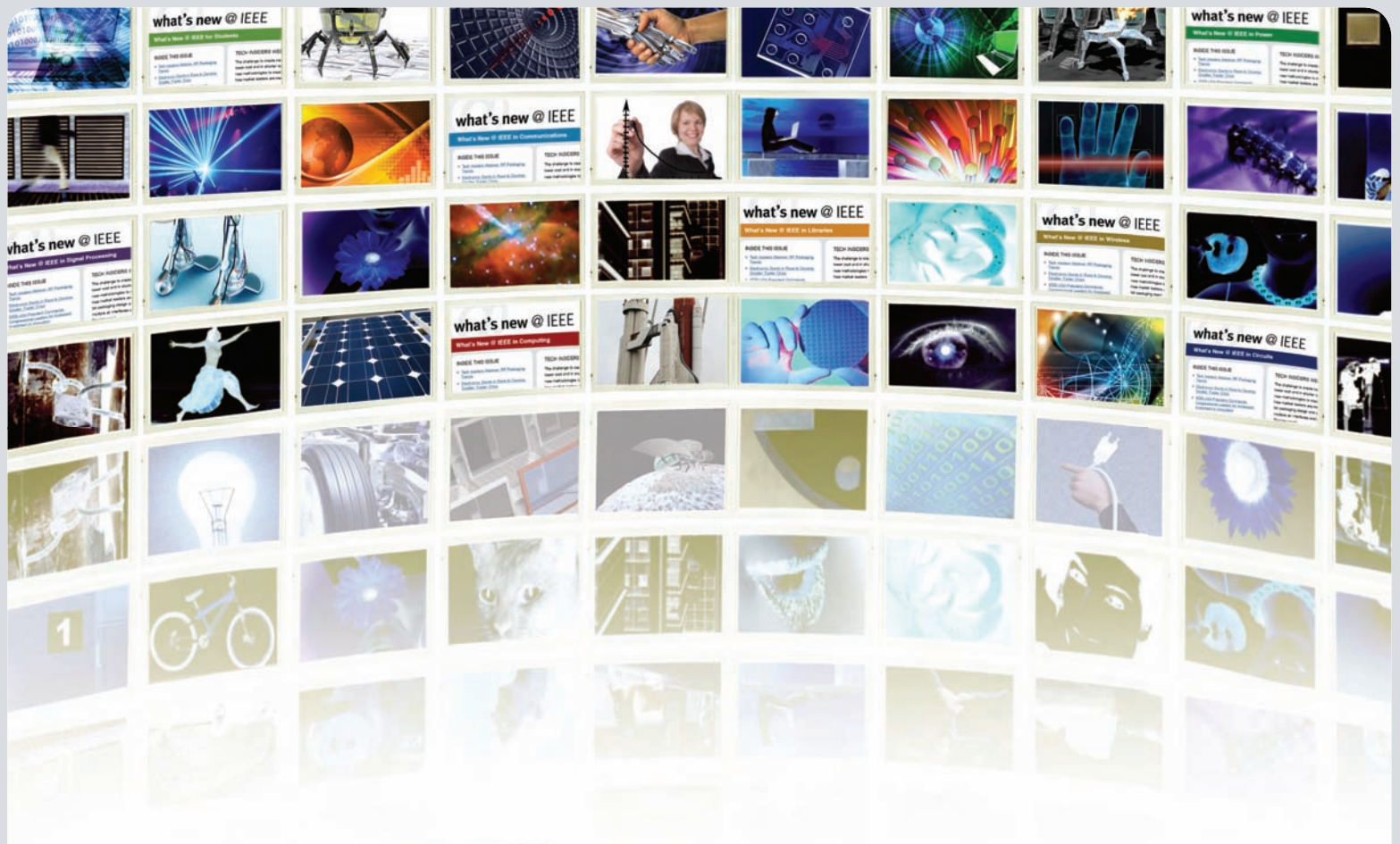
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