the institute

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ONLINE

AVAILABLE 8 SEPTEMBER AT IEEE.ORG/THEINSTITUTE

IEEEXTREME Registration is now open for the annual IEEEXtreme student programming competition.

IEEE E-BOOKS Check out a selection of free titles from the IEEE eBook Classics collection.

BRIEFINGS

IEEE AROUND THE WORLD

REGION 1 Northeastern United States

■ **Long Island (N.Y.) Section** establishes chapter of IEEE Society on Social Implications of Technology.
■ **Worcester County (Mass.) Section** establishes Life Members (LM) affinity group.
■ Student branch formed at **Excelsior College, Albany, N.Y.**

REGION 2 Eastern United States

■ **Northern Virginia** and **Washington sections** establish joint chapter of IEEE Computational Intelligence Society.
■ **Baltimore Section** establishes Consultants Network (CN) affinity group.

REGION 3 Southeastern United States

■ **Atlanta Section** establishes Women in Engineering (WIE) affinity group.

REGION 5 Southwestern United States

■ **Houston Section** establishes CN affinity group.
■ Student branch formed at **Harding College, Memphis, Tenn.**

REGION 6 Western United States

■ **San Diego Section** establishes IEEE Photonics Society chapter.
■ **Seattle Section** establishes LM affinity group.

REGION 7 Canada

■ **Kitchener-Waterloo Section** establishes IEEE Computational Intelligence Society chapter.

REGION 8 Europe, Middle East, and Africa

■ **Czechoslovakia Section** establishes IEEE Systems, Man, and Cybernetics Society chapter.
■ **Morocco Section** establishes chapters of IEEE Antennas and Propagation and Microwave Theory and Techniques societies.
■ **Romania Section** establishes IEEE Computational Intelligence Society chapter.
■ **South Africa Section** establishes IEEE Information Theory Society chapter.
■ **Nigeria Section** establishes IEEE Electromagnetic Compatibility Society chapter.
■ **Switzerland Section** establishes LM affinity group.
■ **Germany Section** establishes WIE affinity group.
■ **Turkey Section** establishes WIE affinity group.
■ **Lebanon Section** establishes WIE affinity group.
■ **Portugal Section** establishes Graduates of the Last Decade (GOLD) affinity group.
■ **Tunisia Section** establishes GOLD affinity group.
■ Student branch at the **Ecole Nationale d'Ingénieurs de Sfax, Tunisia,** forms chapters of IEEE Aerospace and Electronic Systems; Education; Computational Intelligence; Computer; Engineering in Medicine and Biology; Robotics and Automation; Systems, Man, and Cybernetics; and Signal Processing societies and WIE affinity group.
■ Student branch at **Hashemite University, Zarqa, Jordan,** establishes WIE affinity group.
■ Student branch formed at the **Technical University of Kosice, Slovakia.**
■ Student branch formed at the **Technical University of Lodz, Poland.**

REGION 9 Latin America

■ **South Brazil Section** establishes IEEE Photonics Society chapter and GOLD affinity group.
■ Student branch at the **Universidad del Sol, Cuernavaca, Mexico,** establishes WIE affinity group.
■ Student branch at the **Universidad Catolica San Pablo, Arequipa, Peru,** forms IEEE Computer Society chapter.
■ Student branch formed at the **Universidad de Mendoza, Argentina.**

REGION 10 Asia and Pacific

■ **New Zealand Central, South,** and **North** sections establish joint chapter of IEEE Instrumentation & Measurement Society.
■ **Australian Capital Territory Section** establishes IEEE Nanotechnology Council chapter and joint chapter of IEEE Geoscience & Remote Sensing Society with **New South Wales (Australia) Section.**
■ **Republic of Philippines Section** establishes chapters of IEEE Computer and Computational Intelligence societies.
■ **Taipei (Taiwan) Section** establishes IEEE Sensors Council chapter.
■ Student branch at the **National Tsing Hua University, Hsinchu City, Taiwan,** forms IEEE Electron Devices Society chapter.
■ **Xian Section and Macau Section,** both in China, establish IEEE Systems, Man, and Cybernetics Society chapters.
■ **Chengdu Section and Harbin Section,** both in China, establish IEEE Computational Intelligence Society chapters.
■ **Sun Yat-Sen University, Guangzhou, China,** forms student branch.
■ **Beijing Section** establishes IEEE Nanotechnology Council chapter.
■ **Beijing (Shenzhen) Section** establishes chapters of IEEE Engineering in Medicine and Biology and Circuits and Systems societies.
■ **Beijing (Zhengzhou) Section** establishes IEEE Power & Energy Society chapter.
■ **Waseda University, Tokyo,** forms student branch.
■ **Tokyo Section** establishes LM affinity group.
■ **Hyderabad (India) Section** establishes chapters of IEEE Communications and Signal Processing societies.
■ **Madras (India) Section** establishes IEEE Microwave Theory and Techniques Society chapter.
■ **Uttar Pradesh (India) Section** establishes IEEE Microwave Theory and Techniques Society chapter.
■ WIE student branch affinity groups formed in India at **Narayanaguru College of Engineering, Kanyakumari,** and **K.S. Rangasamy College of Technology, Tiruchengode.**
■ Student branch at the **Vellore Institute of Technology, India,** forms IEEE Power & Energy Society chapter.
■ Student branch at the **Amrutvahini College of Engineering, Sangamner, India,** forms IEEE Microwave Theory and Techniques Society chapter.
■ Student branches formed in India at **R.N. Shetty Institute of Technology, Rajalakshmi Institute of Technology, M.A.M. College of Engineering, Reva Institute of Technology and Management, Anna University, Bengal Institute of Technology and Management,** and **Pydah College of Engineering and Technology.**
■ Student branch at the **National University of Computer and Emerging Sciences, Karachi, Pakistan,** forms IEEE Communications Society chapter.

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

ON THE COVER: CLOCKWISE FROM LEFT: DELPHI; MAY TRUONG; IEEE; NANA-AMPOFO AMPOFO-ANTI; JEFF MILLIES. THIS PAGE: ISTOCKPHOTO

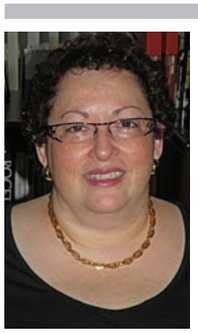
2011 Membership Dues Notice

IEEE MEMBERSHIP BASE dues for 2011 will be US $136, a $2 increase. Regional assessments also charged to members for local activities will see no change. For U.S. members, an additional assessment for IEEE-USA and ABET, the accrediting body in the United States for academic programs in applied science, computing, engineering, and technology, will be $42, an increase of $1.

Dues for student and graduate student members will not rise. The fee for society affiliates, which is set at half the base IEEE dues, increases to $68. Affiliates, who can belong to one or more IEEE societies but are not IEEE members, pay that fee for each IEEE society they join plus the membership dues charged by each society.

Remember to Return Your Ballot

THE IEEE ANNUAL election ballot should have arrived in members' mailboxes last month. In addition to the two candidates for 2011 IEEE president-elect, there are 36 other candidates running for positions in various IEEE divisions and regions, as well as the IEEE Standards Association, IEEE Technical Activities, and IEEE-USA. You can access and return your ballot electronically at https://www.directvote.net/ieee. If you have questions about the election, you may send them to corp-election@ieee.org.



Herz Award Goes to Cozin

JULIE EVE Cozin, director of IEEE Governance and staff secretary for the Board of Directors (BOD), has been named to receive the 2010 IEEE Eric Herz Outstanding Staff Member Award. Cozin was cited for "exemplary service to IEEE governance through development, integration, and administration of new tools and procedures that improved efficiency, transparency, fairness, equity, and legal compliance." She was also cited for having "been able to select, mentor, and retain an excellent group of staff members who work under her leadership and who provide first-rate information and documentation service to BOD members and BOD committees."

Cozin oversaw the development of several resources for the Board, including searchable online archives of BOD and IEEE Assembly minutes, agendas, and decisions. She also worked with volunteers to adopt more efficient procedures for the submission of Board agenda items and for nominations and appointments of candidates to the Nominations and Appointments Committee and the IEEE Assembly.

Cozin began her career in 1981 with the IEEE Technical Activities Board. Shortly thereafter, she became its staff secretary. In 1985, she became the administrator for the staff director of Technical Activities, and four years later she joined the Public Relations department (now Corporate Communications) to serve as administrator to its staff director. Cozin left the group in 1993 to become project manager of BOD and committee support for IEEE Corporate Activities. She was promoted to manager of IEEE Governance in 1997, and in 1999 she became its director.

She is to receive the Herz Award certificate and honorarium at a presentation in November during the IEEE Meeting Series in New Brunswick, N.J.

The IEEE BOD created the award in 2005 to honor Herz, a longtime volunteer who became IEEE general manager and executive director before retiring in 1992. The award recognizes a present or past staff member who has had a substantial impact on the goals and objectives of IEEE, contributed to the success of a number of IEEE initiatives, and led several staff activities.

The nomination deadline for the 2011 Herz Award is 31 January. For more information, visit http://www.ieee.org/portal/pages/about/awards/sums/ericherzsum.html.

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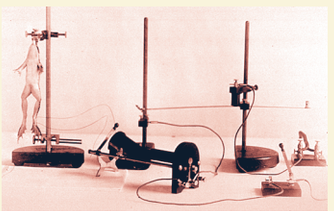
CLOCKWISE FROM TOP LEFT: THE NATIONAL LIBRARY OF MEDICINE; MICROSOFT; BONNIE NANI; MIKE DERER/AP PHOTO; DAVID CROWTHER/ISTOCKPHOTO

SEPTEMBER

4 1882: At the Pearl Street power station in New York City, a **central DC power plant** designed by Thomas Edison goes into service.

7 1893: The **Mill Creek hydroelectric generating plant**, now an IEEE Milestone, begins operation in Redlands, Calif.



9 1737: Birth date of scientist **Luigi Galvani**, who discovered what came to be called galvanic electricity.

10 1960: **Color TV transmissions** begin in Japan.

13 1845: Michael Faraday discovers that a magnetic field can alter the polarization of light—a phenomenon known as the **Faraday effect**.

24–25 **IEEE Region 6** meeting in Salt Lake City.

25 1956: TAT-1, **the first telephone cable across the Atlantic Ocean** and now an IEEE Milestone, begins operation.

OCTOBER

1 1971: Godfrey N. Hounsfield produces **the first computer-aided tomography** image, of a patient's cerebral cyst, at Atkinson Morley Hospital, in London.

4 1957: The first artificial Earth satellite, **Sputnik 1**, is launched by the Soviet Union.

5 1919: The **first conversation between a submerged submarine and a surface vessel** takes place between the U.S. sub *H-2* and the destroyer USS *Blakely*.

6 1987: Microsoft announces **Excel**, its first Windows application.

9–10 **IEEE Region 8** meeting in Prague.

15–17 **IEEE Region 4** meeting in Dearborn, Mich., and **IEEE Region 7** meeting in Toronto.

18 1954: Texas Instruments announces the first commercial transistor pocket radio, **the Regency TR1**, which used germanium transistors.

27 1904: The **New York City subway** begins operation.

28 1955: Birth date of **Bill Gates**, cofounder of Microsoft.

NOVEMBER

1 1995: Intel introduces the **Pentium Pro** microprocessor.

9 1965: Parts of five northeastern U.S. states and one Canadian province are struck by the most **massive power blackout** up to that time in history.

13 1851: The world's first successful **undersea telegraph cable** goes into service, between Dover, England, and Calais, France.

18 1928: The first sound-synchronized animated film, ***Steamboat Willie***, starring Mickey Mouse, premieres.

19 1954: The first **automatic toll-collection machine** goes into service, on the Garden State Parkway in New Jersey.

17–22 **IEEE Meeting Series** in New Brunswick, N.J.

22 1995: The world's first full-length computer-generated feature movie, ***Toy Story***, is released.

Historical events provided by the IEEE History Center. **IEEE events** indicated in red.

Keeping Cars From Crashing

Members are developing warning systems to save lives

BY KATHY KOWALENKO

IT'S NO SECRET that motor vehicle accidents are one of the leading causes of death. Less well known is that more than 90 percent of fatal vehicular accidents involve driver error. Drivers tailgate, fall asleep at the wheel, suddenly change lanes, and back into things and people. Several IEEE members are working with a new breed of driver-assistance systems to keep accidents from happening.

The new systems can, for example, keep cars a safe distance apart, spot objects—or pedestrians—lurking in a driver's blind spot, and warn drivers when their cars are drifting into another lane or about to hit something. Ideally, the systems will prevent accidents from happening. If not, they might at least reduce the damage that results from a collision.

"Our goal is to provide the most advanced technologies to assist the driver while maintaining hands on the wheel and eyes on the road," says IEEE Member Steve Buckley, senior technical specialist of active safety systems with the Chrysler Group in Auburn Hills, Mich.

"Potentially, these systems could save thousands of lives," says Member Michael Thoeny, global director of engineering for Delphi's Electronic Controls Product business unit. The Troy, Mich., company is a leading supplier of electronics to automotive and commercial-vehicle manufacturers. Its active safety customers include Ford, Land Rover, and Volvo.

Advanced driver-assistance technologies include adaptive cruise control, imminent braking systems, forward-collision warning, blind-spot monitoring, and lane-departure warning. They have been available as options in luxury models from Audi, BMW, General Motors, Volvo, and other manufacturers and are found in commercial vehicles. But they are also beginning to appear in mid-priced cars from Chrysler, Ford, GM, Honda, Toyota, and others.

What's more, buyers of new automobiles may soon find these options included as standard equipment. Increasingly, countries see such features as a way to make their roads safer. The European Union, for example, has insisted that some of the new safety systems be included as standard equipment. Lane-departure warning and imminent braking systems will be required on certain heavy-duty vehicles starting in 2013, with consideration for passenger cars not far behind, according to Thoeny.

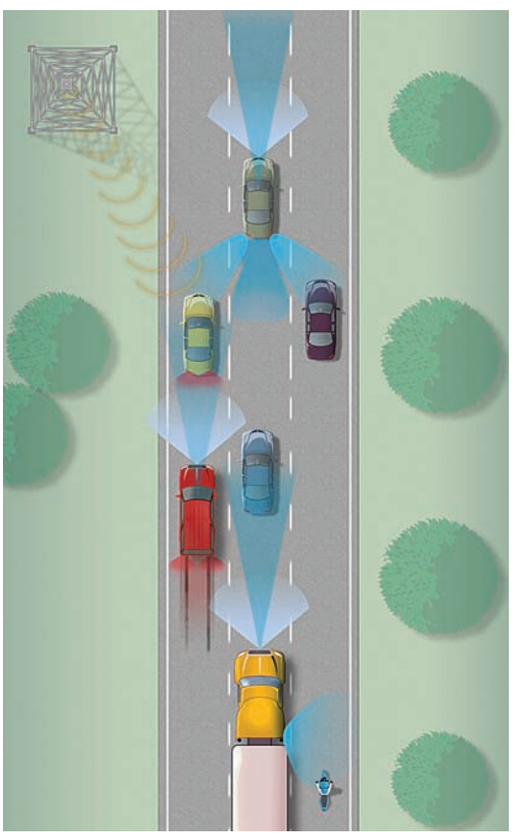
The United States does not yet require any of the technologies to be standard, but the U.S. Department of Transportation's National Highway Traffic Safety Administration is adding forward-collision and lane-departure warnings to its 2011 New Car Assessment Program, a rating system that evaluates vehicular crashworthiness and rollover safety. Car manufacturers—including ones in Australia, China, Japan, and Europe—use these ratings to market their vehicles.

SENSORS GALORE

In all the new systems, sensors play a major role, with radar, vision sensors, and lasers monitoring a vehicle's immediate surroundings to create "a cocoon of safety around the car," Thoeny says.

Adaptive cruise control uses forward-looking radar to track vehicles and objects, Buckley says, and to detect vehicles moving in front and measure their distance and relative speed. The system also relies on a number of other sensors. In addition to the radar sensor, the system processes data from speed, yaw rate, and steering-angle sensors. It also uses a digital signal processor and longitudinal controller. By adjusting engine speed and applying the brakes automatically, the system ensures that a preset distance is maintained between vehicles in the same lane.

Delphi's forward-collision warning system employs visual or audible alerts to notify drivers if it senses a potential collision. It uses a camera, a vision processor module, and a radar sensor. If the driver fails to react to the warning, the system automatically applies the brakes.



A Delphi collision-warning system relies on radar and vision sensors to detect potentially hazardous situations at the front, sides, and rear of vehicles. The system then warns drivers.

Radar also plays a role in blind-spot monitoring. Chrysler's version mounts shorter-range radar sensors on the side of the vehicle to detect other vehicles that might be lurking in the blind spot. A small triangular warning light in each side-view mirror lets the driver know if something is there. Radar sensors can also detect vehicles crossing behind you when you're backing out of a parking spot.

Lane-departure warning systems use a video camera and image-processing techniques that look at lane markings and edges ahead of the car to detect objects and vehicles. If the car crosses a lane divider without a turn signal being turned on, the system uses audible and visual warnings and a vibration in the steering wheel to alert the driver.

TOO MUCH HELP?

The technology provides drivers with more protection, but does it also reduce the control they have over their cars? Motorists can override some of the systems being developed by Chrysler and Delphi, including adaptive cruise control and lane-departure and forward-collision warnings.

Chrysler lets the driver select the following distance, or permits the forward-collision warning system to be turned off entirely. But other features, such as collision mitigation by braking, are part of the vehicle's core safety system and can't be disabled, Thoeny says.

"There will always be real-world situations that can be addressed only by the driver," he says. "Our intent is to keep the driver in the loop as much as possible and only take over control of the car when collisions are imminent.

"These systems are trying to recognize situations where drivers are not responding and to provide an alert that is going to pull their attention back to where it needs to be: on the road," he continues. "Driver-related problems like distractions, fatigue, and alcohol impairment scream out for more than passive safety systems." ■

DELPHI

Where the Candidates Stand

BY ANNA BOGDANOWICZ

THE ELECTION for 2011 IEEE president-elect is at hand, with ballots sent out last month. To help you choose between candidates Gordon W. Day and Joseph V. Lillie, *The Institute* asked them to weigh in on important IEEE issues.

What would be your top two priorities if elected president?

DAY My overarching goal is to help IEEE fulfill its vision of "Advancing Technology for Humanity." To do that, we need to become stronger and better able to help our members advance technology. We must embrace globalization—helping members adapt, providing members around the world with access to resources and activities, and assuring equal opportunities to participate and be recognized. And as the world's largest organization of applied technologists, we have a responsibility to explain to the world how advancing technology creates a better quality of life and increases prosperity.

LILLIE The IEEE president is in a position to create the agenda for IEEE. If I am your president, our agenda will be focused on making IEEE a truly global organization and on increasing member engagement opportunities worldwide. To accomplish this we must develop a strategic process to determine members' needs and requirements in all areas of the world and give all members the opportunity to fully participate in IEEE—to be part of Team IEEE. If we do this, we can ensure that we will maintain our elite status as the largest technical professional society in the world and meet our core mission of fostering technological innovation and excellence for the benefit of humanity.

What differentiates you from the other candidate?

LILLIE I have had the privilege of serving the members of IEEE at the board level since 1998, including serving on the IEEE Board of Directors for six years, two years as a regional director, two years as your treasurer, and the past two years as the Member and Geographic Activities vice president. This experience, combined with my 38 years of engineering management experience, has prepared me to serve as your president. I am experienced, dedicated, and focused, and I commit to you that I will work hard for the members and the profession.

DAY My leadership "tool kit" is unusually broad. It's based on my career as an executive in a large technical organization and my experience in all of IEEE's major business activities—publications, conferences, membership development, standards, education, professional development, public policy, and financial oversight. It includes serving as president of both the IEEE Photonics Society and IEEE-USA, experience in dealing with news media and interacting with high-level public officials, and many years of international experience.

In which technical areas should IEEE be more involved?

DAY We know the growth technologies of today: energy, communications, robotics, IT, and nano- and biotechnologies, to name a few. In these cases our challenge is to harness the full resources of IEEE to develop and expand the products, services, and leadership that technologists in these fields need. At the same time, we should be more systematic in mining our publications, conferences, and members' experience for insights on new directions and opportunities that will emerge in the future.

GORDON W. DAY

Retired researcher and manager, U.S. National Institute of Standards and Technology

MEMBER GRADE
Life Fellow

LILLIE As the various areas of technological interest and the diverse scientific areas come closer and closer together, it will be increasingly difficult to determine the true IEEE fields of interest. The good news is that IEEE plays a role in a wide range of technologies. I don't think that it is about where we should go, but it is about how we get there. The IEEE Technical Activities Board should be continuously reviewing the technology landscape and identifying areas where IEEE should have increased involvement and then develop a plan to get there.

Why do you think only about 15 percent of members vote, and how can this number be increased?

LILLIE I think that the majority of our members do not vote because they do not know the candidates. We need to come up with better ways to engage the members and involve them in the process. We need to use the technologies that our members have created to bring members closer to the election process.

DAY Members tell me they don't vote because (a) they often don't know the candidates, (b) they are sometimes dissatisfied with the choices, and/or (c) they don't think their vote will change anything.

The way to increase member voting is by increasing member awareness and engagement. People vote when they understand they have a real stake in the outcome. We need to better identify the issues that are of concern to members and nominate strong and diverse slates of candidates who are willing to tackle those issues head-on. We should also be doing much more to communicate election information to our members.

What more can IEEE do to help its unemployed members?

DAY Unemployed members need access to job listings, advice on how to conduct an effective job search, information on employers and employment options, and access to retraining and refresher courses. Just as importantly, we need to help members expand their technical skills and develop skills in areas such as leadership, management, organization, and communications that will enable them to survive and thrive through employment disruptions and career transitions. As more members turn to consulting or become entrepreneurs, we need to understand and support their needs.

LILLIE We need to provide help to members throughout their professional careers to keep them from becoming unemployed. My management experience taught me that individuals become unemployed in part because of gaps in their nontechnical skill areas. To address this, we must continue to develop and expand professional development programs at the local level in all areas of the world. We must also increase the effectiveness of the IEEE Center for Leadership Excellence, where we can provide all members with access to online soft-skill development programs. *[The CLE, when fully operational, will be the repository for all the organization's leadership and volunteer training materials. —Editor]*

MAY TRUONG

What can IEEE do to retain students as members after they graduate?

LILLIE Current students are the future of IEEE, and we need to make them part of Team IEEE. As these students begin their professional careers, we need to fully engage these members and introduce them to the entire scope of IEEE. The GOLD (Graduates of the Last Decade) program provides us with the framework to make this happen. We need to make sure that we have an active GOLD affinity group in all sections and that these affinity groups have access to adequate resources. The affinity groups need to fully engage the GOLD members to welcome the new professionals into full membership and to ensure that these members fully understand what IEEE can do for them.

DAY We must work to provide them with positive experiences as student members and help them recognize the value of lifelong professional society membership. We should draw more heavily on the expertise and capabilities of IEEE GOLD members and boost the IEEE GOLD–Student Transition & Elevation Partnership (GOLD-STEP), which is designed to facilitate the transition from student member to young professional. We should proactively explain the value of membership to graduates who drift away; over time, many may return. And we should expand our use of social networking services as a tool for staying in touch with the emerging generation of technologists.

Is it important to attract more women to engineering? Why?

DAY Absolutely. Building a talented, innovative, high-tech workforce is the key to competitiveness for every country and region of the world. Those that fail to develop the talents of half of their populations will lag in quality of life and prosperity. This also applies to other groups that are underrepresented in the high-tech workforce. And there is a bonus: A more diverse workforce is a more creative workforce, more able to solve difficult problems and envision greater opportunities.

LILLIE Yes, it is very important that we attract women to engineering and all technical programs. The profession requires the knowledge, experience, and viewpoints that are provided via the active involvement of all the diversity available to IEEE.

Does IEEE need to improve its global reach? If so, how?

LILLIE We in leadership positions in IEEE must work hard to improve our global reach, and I have made this my top priority. All IEEE members want to be a true part of IEEE, to contribute to the growth of IEEE, and to share in IEEE's accomplishments. It is time for us to assess members' needs in all areas of the globe and to put plans and programs in place that will allow the local leaders to meet the needs of their members. We need to recognize the diversity of our members and allow the entire membership to benefit from this diversity and to be a part of Team IEEE.

JOSEPH V. LILLIE

Consultant, AT&T

MEMBER GRADE
Senior Member

DAY IEEE needs to become globally integrated, for the same kinds of reasons companies like Honda, IBM, and Siemens have become globally integrated: because technology is developed globally, technologists are globally dispersed, and many of the opportunities to fulfill our vision, "Advancing Technology for Humanity," are global. A lesson we should learn from successful global companies is that we must adjust our products, services, and methods of delivery to local needs. That means, among other things, that we will need to have offices in more areas of the world.

What new benefits do you think IEEE should offer?

DAY Younger technologists will hold many more jobs during their careers than past generations, and many more will become contractors, consultants, and entrepreneurs. We must support their needs with opportunities for continuing technical education, nontechnical professional development (e.g., leadership, management, organization, and communications skills), job search resources and skills, expanded peer-networking tools, and business development skills, among others.

Easy and inexpensive access to IEEE publications, once a core benefit for all members, now eludes many and should be restored. Among the many ideas and requests I receive from members, this is the most frequent.

LILLIE We need to offer programs to members to help them develop their nontechnical skills. We currently do a very good job of providing members access to technical information at conferences and via publications, but we can do a better job in what we offer relative to nontechnical skills development. The IEEE CLE is a step in the right direction, and we need to continue this effort and make these benefits available worldwide.

Given its increasing popularity, what role should social networking play in IEEE?

LILLIE Social networking provides IEEE with the opportunity to engage members in a way that they have indicated they are willing to participate. We can use these networks to form virtual societies where members create groups that do not match up with our current society structure but utilize the technical content of parts of several societies. We can also "push" certain information to members of these groups and "pull" information on technical interests of the participants. The more we know about our members, the better we can serve them.

DAY Being a part of a huge network of technical peers is one of the most valuable benefits of IEEE membership. Social-networking sites have already added to that value and have the potential to expand it dramatically. The opportunity and challenge for IEEE will be to facilitate and enhance the trend while maintaining a community of trust.

One reason members give for not renewing is that dues are too high. What would you do to address this issue?

DAY We need to improve the cost-benefit ratio for membership. As president, I will work vigorously with volunteers and staff to (a) identify opportunities to increase the value of IEEE membership and (b) look for efficiencies in operations and business processes that will allow us to constrain or even lower the cost of membership. Where costs deter technologists from joining, we should continue to experiment with electronic membership and perhaps other lower-cost membership options.

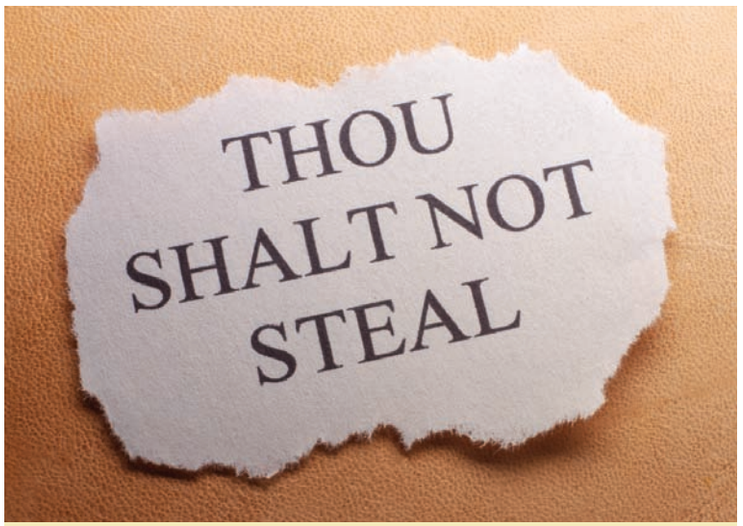
LILLIE The Member and Geographic Activities Board led a study to determine whether a new membership model was feasible. One of the outcomes of this study was the development of the electronic membership option, where members would pay lower membership dues and then receive all information in electronic format in lieu of print. The IEEE Board of Directors approved deploying this model in 124 developing countries. The plan is to evaluate the use and acceptance of this option and then determine if the electronic membership option can be deployed to all areas of the world. If successful, we can move to a lower dues structure. Another area to evaluate is the allocation process currently used to spread member dues to various entities within IEEE. A change in this allocation process could lower member dues without reducing services. ■

For answers to questions on how the candidates would improve IEEE and boost IEEE society membership, visit The Institute Online on 8 September at http://www.ieee.org/theinstitute.

MAY TRUONG

OPINIONS

MARKETPLACE OF IDEAS



THIS MONTH'S QUESTION:

Punishment for Plagiarism

A lecturer at Institut Teknologi Bandung (ITB), in Indonesia, was stripped of his doctorate this year after it was found he plagiarized a paper he claimed to have written. The article was published in an IEEE conference proceeding and posted in the IEEE Xplore digital library. Having a paper published was a prerequisite for obtaining his degree. After an allegation was made, IEEE investigated and determined he had copied the work of an Austrian scholar.

He has since resigned from ITB. IEEE has also published a note on the article in IEEE Xplore, saying the article is in violation of IEEE's publication principles because it contains a nearly complete duplication of the other researcher's paper, published in 2000 in the *Proceedings of the 11th International Workshop on Database and Expert System Applications*. He has also been prohibited from publishing in all IEEE publications for three years, beginning in April 2009.

What is a fair punishment for plagiarism? Do you think it's a big problem in the engineering field?

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 December issue of The Institute *and may be edited for brevity. Suggestions for questions are welcome.*
MAIL: The Institute, *IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08854-4141 USA* ***FAX:*** *+1 732 562 1746* ***E-MAIL:*** *institute@ieee.org*

RESPONSES TO JUNE'S QUESTION

Diversity and Competitiveness

For an article it planned to publish, the San Jose Mercury News, *in California, set out to obtain data on the race and gender of the employees at 15 Silicon Valley companies through a U.S. Freedom of Information Act request. Nine of the firms agreed to share the information, saying they had nothing to hide. The other six refused. Apple, Applied Materials, Google, Oracle, and Yahoo convinced federal regulators who collect and release the data that disclosure in the newspaper could cause the companies economic harm by revealing their business strategies to competitors. The sixth company, Hewlett-Packard, fought the release and lost.*

Should the companies be forced to release their demographics? How important is diversity to the competitiveness of a company?

Something to Hide?

I can't picture how a company could capitalize on knowing the demographics of Google or Yahoo. It's possible that revealing the data could show its own employees, who only have a local view of the organization, that the company is less diverse than it claims to be. The revealed lack of diversity may put a dent in employee morale. The companies' excuse about revealing business strategies just smells like a legal cop-out that is hard to prove wrong.

MATTHEW RING
Fredericksburg, Va.

No Quotas, Please

I see no reason why the employee demographics of a company should be kept secret, and I don't see how this information would reveal anything about the company's business strategies. That being said, I don't think diversity has any bearing on the competitiveness of a company. Employees should be hired on merit, not to fill demographic quotas.

MARK L. LEGUTKO
Newark, Del.

One Big Scheme

Diversity is irrelevant to the competitiveness of a company. It is a scheme by which political pressure groups persuade companies to reserve jobs for their members. The idea that diversity is beneficial has become conventional wisdom with no proof that it works. Only competence should matter in the hiring and promotion of employees.

MYRON KAYTON
Santa Monica, Calif.

Food for Lawyers

Using the plethora of nonobjective laws to shake down companies is now a growing industry among certain types of lawyers. They scrutinize the employment practices of companies forced to release demographics. It is already bad enough that affirmative action laws force companies to collect racial data.

How important is diversity to the competitiveness of a company? This is a non sequitur. The competence of the employees is what counts. If a company values race over competence, it will fail in the marketplace, so long as that marketplace is laissez-faire.

ADRI KALISVAART
Lincoln, R.I.

Racist Policy

The mere idea that there might be a "racial policy" is racist. To insist that a company must reveal its demographics forces the company to have some racial policy in place if some distribution is seen as negative. So, no company should be forced to release its demographics. The only policy should be to hire the most skilled people for the job.

PAUL FOURIE
Christchurch, New Zealand

Public Obligation

Not only should a public company enjoy the financial benefits of being such a company, it should also serve the public. It is unfair that people cannot know a statistic about a public company, such as demographic data.

SERGEY LOY
Glenelg, Australia

Nonconstitutional

Google's refusal to disclose the ethnicity of its staff out of fear that it would hurt its market position tells me that it hires minorities to better serve local target markets. The goal of such hiring is company success—not diversity.

The politically correct goal of diversity is a detriment to the advancement of society. Any activity that dilutes the goal of excellence reduces the quality of the outcome. The goal of diversity is not American. The word is neither in the U.S. Constitution nor the Declaration of Independence. It is a 20th-century theme that has contributed to the United States's falling competitiveness in worldwide commerce.

ROBERT COLLIER
Houston

Mind Your Own Business

Employee demographics are nobody's business. Collecting such data merely allows the snoops and regulators a toehold where they don't belong.

In all for-profit organizations, the goal should be to select the most competent person for each job, regardless of race, color, religion, sex, age, or whatever. To settle for less is to convert companies into nonprofit organizations.

KENNETH HOFFMANN
Alexandria, Va.

A Reason for Secrets

The argument that a company's demographics will reveal business strategies is a good reason for them not to be released. For example, if one of your strategies is to do a lot of business in a particular country or region, you might expect a lot of employees to be from there. If demographics revealed a lot of Asian or African employees, it might suggest a business development strategy in those areas of the world.

NANCY MEAD
Pittsburgh

LETTERS

Gender Gap Issues

I disagree with the point made in Mark Kelcourse's recent letter [Letters, June, p. 10]. There have been a number of initiatives to get more men into nursing, including national programs such as Johnson & Johnson's Discover Nursing campaign and one by the American Association of Nurse Anesthetists.

The nursing industry has taken on the gender gap for a number of reasons. It is good for patient care and the nursing profession to have a ratio of men to women that reflects the population. Everyone benefits, including men seeking a career in which making a difference in other people's lives is important. Clearly, the arguments addressing the gender gap in engineering are the same as those in nursing. The push for gender equality hardly, as Kelcourse states, "leads people to wasting valuable time pursuing something that will not fulfill them."

LIZ MADIGAN
Cleveland

Red Hot Rovers

In "Roving Space Explorers" [June, p. 5], the stories behind the Mars rovers Spirit and Opportunity made for fascinating reading.

You mention Spirit's attempts to orient its solar panels so they can catch more warming rays. The critical components in these machines are kept warm during Martian nights and winters by eight radioisotope heaters on each rover. The next Mars robotic explorer, Mars Science Laboratory, will be warmed solely by radioisotope thermoelectric generators, which are powered by radioactive decay.

ED JOHNSON
Sunnyvale, Calif.

E-Book Excitement

After reading "Chalk Up Another Member Benefit: Free E-Books" [June, p. 14], I looked up a book that helped me explain a problem to one of my coworkers, who was studying for his professional engineer licensing exam. I found exactly what I needed. The free e-books are a great new benefit. Some time ago I wrote to 2009 IEEE president John Vig, recommending having this type of benefit for members, and I'm so glad it was finally implemented.

STEPHEN BABSKY
Staten Island, N.Y.

CORRECTIONS: *The UNIVAC 1 was not the world's first commercial computer, contrary to an item noted in the Calendar [June, p. 4]. Many historians consider the U.K.'s Ferranti Mark 1 to be the first commercial computer.*

"Cryptography Breakthrough Is 100th Milestone" [p. 8] incorrectly stated that James Ellis was not a mathematician.

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PRESIDENT'S COLUMN

Opportunities for Expanding Our Technical Reach

NOW SPANNING three centuries, IEEE first encompassed only power engineering. Later it added radio and electronics and more recently computing and software engineering. It now has 45 societies and councils that cover hundreds of technical interest areas—a list that grows every day.

The expanding list is driven by new and emerging technologies as well as the convergence of existing ones. It all provides great opportunities for IEEE to extend its reach into other fields.

We are involved in a number of new areas through our working groups, including ones dedicated to biometrics, distributed diagnosis and home health care, the hydrogen economy and alternative fuels, and the smart grid.

The smart grid is an excellent example of an area with great opportunities for IEEE. It is a relatively new initiative and is a logical fit with our long history in electric power and standards development. The smart grid is a grand vision to create an electrical transmission and distribution system that is more reliable, secure, economical, environmentally friendly, and safe. Several IEEE societies and the IEEE Standards Association are taking lead roles in making it a reality.

For example, the IEEE Power & Energy Society (PES) sponsored the first Conference on Innovative Smart Grid Technologies in January, in Washington, D.C. The immense scope of the smart grid can be seen in the list of its technical cosponsors: the IEEE Communications, Computer, Power Electronics, and Signal Processing societies, along with IEEE-USA. The smart grid also was a major topic at the annual IEEE Transmission and Distribution Conference held in New Orleans in April—which was sponsored by PES.

IEEE is uniquely positioned to guide the development of technical standards for the smart grid. There are already nearly 100 IEEE standards and standards in development in areas relating to the grid. In addition, the IEEE Standards Association is collaborating with the U.S. National Institute for Standards and Technology and other groups to create the Smart Grid Interoperability Standards Roadmap, which includes plans for developing the architecture and infrastructure. It also identifies nearly 80 existing standards that can be used now to support the smart grid and points out gaps where new or revised standards are needed.

And IEEE has launched its Smart Grid Web Portal [http://smartgrid.ieee.org], which features news and information about conferences, publications, standards, and tutorials.

Other disciplines not traditionally associated with IEEE also offer opportunities for us to expand our technical reach. Health care science is a natural fit for IEEE. There will always be a need for a source of reliable information on the topic. Health care scientists are vital in the prevention, diagnosis, and treatment of a large number of medical conditions. Along with doctors, nurses, and other professionals, they are essential members of today's health care team. There are obvious needs for information on standards and interoperability among the various professional skill areas of health care science.

Life science aims at improving our health and well-being as well, and it is an area where IEEE has vast expertise. The broad field includes animal science, biochemistry, neuroscience, plant science, and tissue engineering. A quick search on the term "life sciences" in the IEEE Xplore digital library shows more than 10 000 articles and conference papers on the subject. To make IEEE a key player in the life sciences, however, we need to attract professionals from the field to join IEEE.

Another developing interest area for IEEE is entertainment engineering. It is not a new field, but it is one that, again, is a natural fit for us. It applies electrical engineering and information technology along with disciplines such as mechanical and structural engineering. All those fields come together to create special equipment, devices, and processes for the entertainment industry. It is the driving force behind the 3-D techniques used in the movie *Avatar* and the technology for IMAX theaters. Entertainment engineering is also involved with helping design and run theme parks where, for example, mechatronics and robotics are used extensively.

IEEE is committed to exploring emerging areas and becoming a stronger, more visible organization that is better able to serve its members and customers

IEEE is committed to exploring emerging areas and becoming a stronger, more viable organization that is better able to serve its members and customers around the world. I would like to hear your ideas for new areas of interest for IEEE. You can e-mail me at president@ieee.org.

Pedro Ray
IEEE President and CEO

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MyIEEE Gets More Personalized, Adds E-Mail

BY KATHY KOWALENKO

MyIEEE, where members can access their IEEE benefits and check on their journal and magazine subscriptions, has added features that make the site more interactive and easier to use.

Members can now personalize their pages to link to favorite IEEE Web sites from myIEEE's four categories of content: volunteer, knowledge, community, and profession. They can also add RSS feeds from IEEE or other content providers, change background colors, and add graphics that reflect their individual technical bents.

In addition, a new messaging tool allows e-mail to be sent to IEEE members from within myIEEE, without launching a separate mail program.

"The new capabilities mark an important milestone because they provide members with the ability to organize favorite myIEEE content their way," says Brian Pratz, product manager, IEEE Member and Geographic Activities, in Piscataway, N.J.

DISTINCTIVE DESKTOP

The new myDesktop tool and its Customization button make the personalization happen. Users can add modules for the four content categories that contain links, with identifying icons, to the corresponding IEEE products and services.

The modules, referred to as gadgets, are listed in the Browse Gadgets menu on the right-hand side of myDesktop. The list of gadgets includes the IEEE Job Site, IEEE.tv, *IEEE Spectrum*, section activities, volunteer resources, upcoming conferences, and scholarships available from IEEE. Simply click on the plus sign next to each image and it's added to your desktop, or click on the X to delete it. You can position the gadgets by dragging and dropping them anywhere on the screen.

RSS Feeds

You can use the Import an RSS Feed button to add headline updates from IEEE sites or external news, blogger, podcast, or video sites. Up to 10 feeds are possible. Just type or paste the URL into the box and click on the Add button.

Themes

For those who want to change the look of the page, there are options under the Edit Theme menu to add a graphic and choose a new background color.

Fifteen graphics (some are shown at left) are available. Some depict a technology; others are simply based on color. Technology themes include aerospace, computers, and semiconductors. The color choices are blue, green, dark violet, and dark orange. Clicking on an image or a color automatically changes the background.

Columns

There are other options for organizing the page visually. Under the Edit Layout section, you can arrange your gadgets into one, two, or three columns. For the two- and three-column options, you can select among various width ratios.

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Say while searching memberNet, the online directory of IEEE members available in myIEEE, you discover the profile of a former colleague you'd like to catch up with. Instead of jotting down her e-mail address and typing the address later into your e-mail program, you can now send her a message right from memberNet—provided she has opted to share her address. If so, click on the Send a Message button in her profile. An e-mail form is then displayed with the recipient and sender information already filled in. All you do is fill in the subject line, type your note, and hit the Send Message button. ■

FOR MORE INFORMATION about myIEEE, visit http://www.ieee.org/membership_services/membership/my_ieee.html.

IEEE International Conference on Electronics, Circuits, and Systems

Athens, 12–15 December

Covers design methods, techniques, and experimental results in emerging electronics, circuits, and systems, including analog and digital electronics, solid-state, power, high-speed, automotive and biomedical technologies, and digital signal processing. Also on the agenda are high-frequency electronics, industrial automation, antennas and propagation, image processing, telecommunications, and multimedia.
SPONSORS: IEEE Circuits and Systems Society and the University of Patras, Greece.
VISIT: http://www.icecs2010.org

IEEE Sensors Conference

Waikoloa, Hawaii
1–4 November

With a focus on research and development, the conference covers sensor modeling and evaluation, chemical and gas sensors, biosensors, optical sensors, mechanical and physical sensors, sensor/actuator systems, networks, and applications.
SPONSOR: IEEE Sensors Council
VISIT: http://www.ieee-sensors2010.org

IEEE Biomedical Circuits and Systems Conference

Paphos, Cyprus
3–5 November

This year's theme is smart hybrid biosystems. Topics include bio-inspired systems; imaging technologies and image processing; biosensor devices and interfaces; electronics for brain science; implantable electronics; medical information systems; and wireless technology for medicine, biology, and the life sciences.
SPONSORS: IEEE Engineering in Medicine and Biology Society, Circuits and Systems Society, and the University of Cyprus, Nicosia.
VISIT: http://www.biocas2010.org

IEEE International Conference on Robotics and Biomimetics

Tianjin, China
14–18 December

This year's theme is robotics and biomimetics for human science and engineering. Topics include the merging of robotics and biomimetics, particularly biologically inspired robots meant to improve the quality of life. Papers addressing sensor networks and virtual reality are also anticipated.
SPONSORS: IEEE Robotics and Automation Society, Hebei University of Technology.
VISIT: http://www.robio.org

IEEE Radio and Wireless Symposium

Phoenix
16–20 January

Sessions highlight the use of silicon in modern wireless systems, RF power amplifiers, biomedical wireless technologies, and sensing systems. Topics include passive antennas, propagation channel modeling, transceivers and front-end technologies, signal processing, smart antennas, software-defined radios and cognitive radios, system architecture and modeling, and passive components and packaging.
SPONSOR: IEEE Microwave Theory and Techniques Society
VISIT: http://www.rawcon.org

IEEE International Conference on Microelectromechanical Systems

Cancún, Mexico
23–27 January

The conference addresses design, simulation, and analysis tools with experimental verification; fabrication technologies and processes; and electromechanical integration techniques. Optomechanical microsystems and nano-electromechanical systems are also on the agenda.
SPONSOR: IEEE Robotics and Automation Society
VISIT: http://www.ieee-mems2011.org

Spotlight on Products

IEEE Std. 11073-30400-2010, released June 2010

The Health Informatics-Point-of-Care Medical Device Communication—Part 30400: Interface Profile-Cabled Ethernet standard addresses the application of the Ethernet family (IEEE 802.3) of protocols used in medical device communications. The new standard covers specifications and requirements with a focus on how to control costs and ease interoperability.

IEEE Std. 802.1Qau-2010, released April 2010

The IEEE Standard for Local and Metropolitan Area Networks—Virtual Bridged Local Area Networks Amendment 13: Congestion Notification specifies the protocols, procedures, and managed objects (devices that can be operated) that help handle congestion in long-lived data flows in networks of limited-bandwidth-delay products. Data center networks and backplane fabrics use applications that depend on the delivery of data packets with a lower latency and much lower probability of packet loss than is typical of IEEE 802 Virtual LAN bridged networks. This amendment covers how to use a single bridged LAN for these applications as well as for traditional LAN applications.

The following are from IEEE and the American National Standards Institute:

IEEE/ANSI C63.15-2010, released May 2010

The American National Standard Recommended Practice for the Immunity Measurement of Electrical and Electronic Equipment covers products with a frequency range of 30 hertz to 10 gigahertz. It includes methods that manufacturers should use to ensure their products are reliable and have greater immunity than is required by U.S. law. Immunity is the ability of devices, equipment, or systems to perform without degradation in the presence of an electromagnetic disturbance.

IEEE/ANSI N42.47-2010, released April 2010

The American National Standard for Measuring the Imaging Performance of X-ray and Gamma-ray Systems for Security Screening of Humans applies to systems used to detect objects carried on or in a person's body. The purpose is to provide standard methods of measuring and reporting imaging characteristics and to establish minimum acceptable performance requirements.

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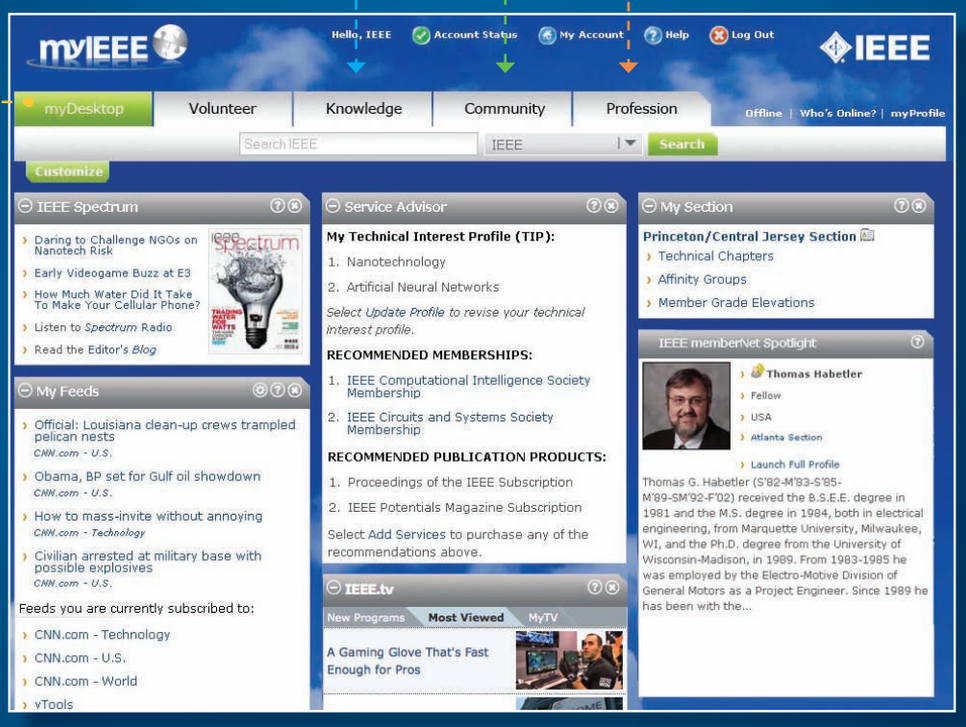

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Advancing Technology for Humanity

Sanna Gaspard

High-Tech Healer

Using automated physiotherapy to help premature babies

BY SUSAN KARLIN

AS AN UNDERGRAD at the University of Miami, Sanna Gaspard was deciding between a career in medicine and bioengineering when she took an internship at a nearby hospital to assist researchers performing clinical experiments on the effects of massage on premature babies. In the end, she chose bioengineering, but her summer internship left a lasting impression. Now an IEEE graduate student member, Gaspard is developing a device that might significantly influence neonatal care.

Her Neonatal Automated Physiotherapy (NAP) device mimics a manual infant massage by cradling the baby against a padded support, which covers a mechanical system that provides gentle tactile stimulation. The NAP device is designed to produce the same health benefits as manual massage, which include a strengthened immune system, increased weight gain, and improved circulation, behavior, and digestion—all of which can help boost a premature infant's survival rate. The device, which can be timed to work with a baby's feeding and sleeping schedules, allows hospitals to implement infant massage by automating a labor- and cost-intensive procedure.

Gaspard's neonatal device and her research in bedsore diagnosis landed her on the U.S. National Engineers Week Foundation's 13 New Faces of Engineering list for 2010. The program highlights the vitality, diversity, and contributions of engineers younger than 30. The foundation is a coalition of companies, government agencies, and engineering associations, including IEEE-USA.

Now a Ph.D. candidate in biomedical engineering at Carnegie Mellon University, in Pittsburgh, Gaspard, 28, is continuing to follow her passion for medical technology. In addition to perfecting the NAP prototype, she is developing an early bedsore diagnostic device, the Rubitect, which uses LED emission and reflection to detect the early breakdown of skin that heralds pressure-ulcer formation.

Gaspard has filed for patents on both concepts and founded companies to commercialize the products: TLneoCare for the NAP device, launched in 2007, and Rubitection for the Rubitect, earlier this year. She's seeking investors and strategic partners to help manufacture both products.

"It takes a few years to commercialize a medical device," she says. "It's not like a retail product that you can turn around in a year. You need to do clinical trials and get [U.S. Food and Drug Administration] approval before going to market. What keeps me excited is the really enthusiastic feedback from doctors and clinicians who'd like to test both technologies in their hospitals."

MAKING THE DECISION

Born on the Caribbean island of St. Lucia, Gaspard grew up in Orlando, Fla., where as a child she showed an affinity for science, math, and taking things apart to see how they worked. She went on to major in biomedical engineering and minor in electrical engineering at the University of Miami.

Despite her engineering focus, she was seriously considering a career in medicine as a neonatologist. In 2003, the summer between her junior and senior years, she tested the waters by interning in the neonatal intensive care unit at Jackson Memorial Hospital in Miami. Part of her duties included collecting data on the physiological response of infants to massage, used on both preterm low-birth-weight and full-term healthy babies.

"I noticed how difficult it was to implement manual infant massage effectively," she recalls. "It has to be done three times a day around the babies' eating and sleeping schedules. It seemed impractical and costly, since the hospital needs to hire certified nurses. I thought automating the process would encourage hospitals to adopt the therapy to improve the babies' health and reduce costs, since massaged infants are typically released from the hospital up to six days sooner than nonmassaged infants."

Gaspard worked on a rudimentary NAP prototype for her senior-year design project, which used off-the-shelf motors, timers, cams, and pulleys housed under a neonatal mattress outfitted with bumper supports to cradle the infant. She tested the device on dolls and is currently working on a next-generation prototype.

The idea for the Rubitect came early in her doctoral research in 2006, after she learned about the prevalence of debilitating bedsores and the difficulties in diagnosing them early. Current diagnostic techniques rely on observing how quickly a reddened skin lesion whitens with gentle finger pressure—which is difficult to see on dark skin. The handheld Rubitect shines light onto the skin and detects changes in the tissue by analyzing the attenuation of the reflected light.

Gaspard joined IEEE while in graduate school and is a member of the IEEE Circuits and Systems, Engineering in Medicine and Biology, and Instrumentation and Measurement societies, as well as IEEE Women in Engineering.

She has managed to combine the best of the two fields she once had such a tough time deciding between. "At the hospital internship, I liked what I was doing, but I didn't like the lifestyle," she says. "It could be extremely hectic, with long work hours and little family time. Plus, I'm a bit germophobic, so I thought that maybe this wasn't the best path for me. However, I really like engineering—and I can still make an impact in medicine by coming up with technological solutions to medical problems." ■

CARNEGIE MELLON UNIVERSITY

(Left) IEEE student members and the students from South Africa's Thandokhulu and Westerford secondary schools. (Right) North Penn High School students from the Philadelphia Section EPICS program.

Community Service Program Expands

BY ANNA BOGDANOWICZ

HOW DO YOU get high school students interested in engineering? One way is to give them hands-on activities that show them engineering can be fun and of benefit to society at the same time. That's the philosophy behind the Engineering Projects in Community Service (EPICS) in IEEE, an outreach program in which section volunteers mentor IEEE student and graduate student members as they work with high school students on engineering projects that help the community.

EPICS in IEEE began in 2008 in the IEEE Philadelphia and South Africa sections. IEEE volunteers in Philadelphia and the student branch at Drexel University, also in Philadelphia, in consultation with the nonprofit Philadelphia Clean Air Council, teamed up with local high school students to help develop a sensor network to monitor the city's air quality. At the University of Cape Town, South Africa, student branch members worked with high school students to build a wind-power turbine for a village.

The projects were so successful that this year the IEEE New Initiatives Committee (NIC) allocated US $450 000 over three years to expand the program. IEEE Educational Activities, the organizational unit that oversees the program, has approached more than 10 sections to start their own EPICS projects.

ROOTS AT PURDUE

EPICS in IEEE wouldn't have happened at all had it not been for a former IEEE president who inspired two IEEE volunteers to follow in her footsteps. In 1995, Leah Jamieson, who became the 2007 IEEE president, launched EPICS at Purdue University, in West Lafayette, Ind., where she is now dean of engineering. The program comprises two outreach efforts: EPICS-University and EPICS-High. EPICS-University involves teams of undergraduate engineering students working with a local nonprofit community organization to develop technologies to solve an engineering challenge, such as building an irrigation system for a community garden. EPICS-High has high school students joining the university-based team and providing some of the design and implementation work.

In 2008, EPICS sparked the interest of IEEE Senior Members Kapil Dandekar and Saurabh Sinha. Dandekar is an associate professor of electrical and computer engineering at Drexel and chairs the IEEE Educational Activities Preuniversity Education Coordinating Committee. Sinha, a senior lecturer at the University of Pretoria, South Africa, is chair of the South Africa Section.

"With IEEE's mission of advancing technology for humanity, it made sense to extend the Purdue program to IEEE," Sinha says. He and Dandekar proposed the idea to the NIC, which provided $25 000 for the programs.

CLEAN AIR

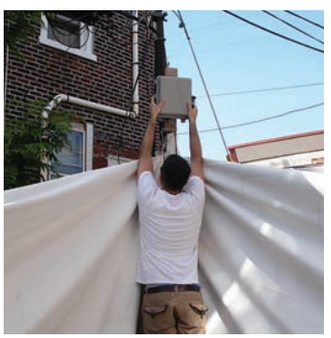
Dandekar, other faculty, and the IEEE student branch at Drexel decided on the project for the Philadelphia Clean Air Council, which is focused on improving the city's air and water quality. The project was to design and install a low-cost sensor network to develop a preliminary screening system that checks whether air quality in Philadelphia neighborhoods meets U.S. Environmental Protection Agency standards.

The Drexel students worked with high school students from the Philadelphia Science Leadership Academy and North Penn High School. The high school students learned about the principles of engineering design, conducted experiments to develop sensor deployment strategies, and built sensor networks for deployment around their schools. A six-node sensor network was deployed in several Philadelphia neighborhoods, and a Google Earth interface was developed to display the results. If readings from the network indicate that standards have been breached, further testing with more expensive equipment may be undertaken by local authorities. Throughout the project, Dandekar and other section volunteers guided the student members and provided technical input.

WIND ENERGY

In South Africa, Sinha worked with the University of Cape Town student branch members on ideas for an alternative energy project. To understand the challenges, the team reviewed thesis proposals by the school's engineering students. They settled on Student Member Justin Alvey's project to build a wind turbine out of scrap material to generate power for a local village.

The group worked with students from Thandokhulu and Westerford secondary schools. After teaching the youngsters the basics of wind power, the student members helped the high school students design and build the 1-meter-long blades for the turbine. Alvey developed the generator on his own as part of his thesis project. Along the way, student branch counselor Azeem Khan and Graduate Student Member Nana-Ampofo Ampofo-Anti were on hand to give the student members design tips and technical guidance. In three months, a prototype was built that could deliver some 50 watts. This year, the student branch hopes to work with two other schools to install the turbine.



(Top) A student from the Philadelphia Section EPICS program installing a sensor. (Bottom) Students in the South Africa Section working on the wind-power turbine.

Sinha says he hopes the experience has inspired the high school students to consider engineering. "Some have already selected subjects to study that will help them qualify for an engineering program," he says. And the IEEE student branch members learned a thing or two as well, according to Dandekar. "The mentors encouraged student members to think of the process as running a small business, with the high school students as employees who needed to be guided," he says.

If your section or student branch is interested in EPICS in IEEE, visit http://www.ieee.org/education_careers/education/preuniversity/epics_high.html.

CLOCKWISE FROM TOP RIGHT: MICHAEL BOYER; RENEE DORSEY; NANA-AMPOFO AMPOFO-ANTI(2)

Brian Connelly

Professional Daredevil

THERE'S PRACTICALLY nothing like a three-story fall to get the juices flowing. That's the idea behind IEEE Member Brian Connelly's hobby: stunt work. Since helping to start the company Asylum Stunts seven years ago, Connelly has been performing and choreographing stunts, as well as training people for movie and TV shoots, commercials, music videos, plays, video games, and live events. You might have seen his team's handiwork in the film *Public Enemies* and a Gatorade commercial featuring basketball star Yao Ming.

Connelly is chief software architect for Miskatonic Software, the Chicago IT consultancy he founded seven years ago. As director of Asylum Stunts, he practices with a group of about 10 aspiring stunt professionals. "We're mostly hired for fight choreography, battle scenes, people falling out of third-story windows, down staircases, and out of cars, and for wire work—stunts that involve getting hooked up to a crane and flying out of explosions," he says.

PASSION Performing stunts
PROFESSION Software architect
HOMETOWN Chicago

Amazingly, he hasn't gotten too banged up in the process. "I've had some hairline fractures and a few cuts that maybe should have been stitched," he says, "but nothing you couldn't Krazy Glue shut."

Connelly's interest in stunts began in his mid-30s, but the seeds were sown much earlier. He attended Iowa State University, in Ames, on a gymnastics scholarship and went on to dabble in other activities, including martial arts, horseback riding, fencing, skiing, and rock climbing—all of which would later help his stunt work.

In 2001, he happened on the Chicago Stunt Team practicing at a local gym and was hooked by the variety of skills required. He began working with the group on basic stunts, like learning how to fake a punch or cushion a fall, and then progressed to more complex ones such as timing moves to coincide with explosions and other special effects. After two years of creating and performing stunts with the Chicago group, he became codirector and then left to form Asylum.

He is now gearing up to direct fight scenes for the Minneapolis cult stage hit *A Klingon Christmas Carol* when it makes its Chicago debut later this year.

"It's hard to get tired of my hobby, because of the variety of stunts I get to come up with," he says. "It always challenges me." *—Susan Karlin*

Susan Garrod

Trombone in Paradise

IEEE MEMBER Susan Garrod plays well with the guys. One of the few women in her engineering company, she says she is among only a handful of trombone players in Hawaii.

"When you want to recruit women into engineering," she says, laughing, "start with the band's brass instrument section," which includes trumpets, horns, tubas, and trombones. "Playing the trombone, or any other male-dominated musical instrument, is fabulous preparation for women entering engineering. Playing an instrument is creative, collaborative, and good mental training, and the music and math connection is very strong."

PASSION Playing trombone
PROFESSION Account manager
HOMETOWN Kailua-Kona, Hawaii

When Garrod is not working as a commercial account manager for Hawaii Electric Light Co., in Kailua-Kona, she spends up to 25 hours a week rehearsing and playing trombone with the Olliephonic Horns big band, the Kamuela Philharmonic Orchestra, and two ensembles she helped found, the Kona Brass quintet and the Casablanca jazz quartet.

Every so often, she gets to combine science and art. Last year she helped create a concert program for the island of Hawaii's Volcano Art Center, which was celebrating the 40th anniversary of the Apollo 11 moon landing. The concert used music and commentary to tell the story of the space race. After Garrod narrated the historic accounts, she and Kona Brass performed music from the 1960s, as well as such thematic songs as "Fly Me to the Moon."

Garrod has had a passion for playing trombone since age 10, while growing up in Cleveland. Her elementary school's music program introduced her to the instrument, and her parents signed her up for lessons. "I already played piano, but that can be a very solitary instrument," she says. "The trombone was unique. I was typically the only girl in the trombone section, so I learned how to both compete and collaborate with the boys."

While earning bachelor's, master's, and doctoral degrees at Purdue University, in West Lafayette, Ind., she played with several university and local bands and orchestras.

Playing trombone requires consistent practice to maintain strong facial muscles to create and control notes at the mouthpiece and a developed ear to adjust the slide, which has no markings.

"The trombone provides the greatest variety of sounds available to a musician," she says. "Plus, trombonists have a great sense of humor. You can't take yourself too seriously when you play such a fun instrument." *—S.K.*

If you have an interesting hobby you'd like to share, e-mail the editors: institute@ieee.org.

TOP: JEFF MILLER; BOTTOM: BOB BORNS

RECOGNITIONS

MEMBER
CHARLES G. REID

Reid has been appointed chief technology officer of Specialized Technology Resources, in Enfield, Conn. STR develops solar encapsulants used to laminate and protect the substrates and superstrates that hold solar cells. In his new role, Reid will oversee the company's R&D and technical services departments.

Most recently, Reid was a principal at Manzanita Consulting LLC, in Southlake, Texas, an independent provider of consulting services to manufacturers that use polymers and composites. There, he oversaw the development of encapsulants and backsheets, which are used for solar electric products including roof shingles and slates that can be integrated into buildings. Prior to that, Reid worked at Solvay Engineered Polymers, in Mansfield, Texas, as a manager in the automotive interiors business department.

Reid is a member of the IEEE Dielectrics and Electrical Insulation Society.

FELLOW
ARTHUR C. SANDERSON

Sanderson has been named a Jefferson Science Fellow by the U.S. Department of State. He is one of 12 such fellows selected this year to explain the current state of science, technology, and engineering to policy makers. Sanderson is vice president of research and a professor in the department of electrical, computer, and systems engineering at Rensselaer Polytechnic Institute, in Troy, N.Y.

He will spend one year at the U.S. Department of State or the U.S. Agency for International Development, sharing his expertise in the rapidly advancing area of secure terminal equipment used for encrypted wired telephone communications.

Sanderson's research on the theory and development of robotics and intelligent systems has led to advances in sensor-based robotic control, planning and reasoning for intelligent systems, and distributed sensor networks.

Sanderson is a member and past president of the IEEE Robotics and Automation Society. He is also a member of the IEEE Computer Society.

FELLOW
F. DONG TAN

Tan received the Asian American Engineer of the Year Award from the Chinese Institute of Engineers, USA, for his "strong leadership and technical skills." The award recognizes outstanding Asian-American professionals for significant contributions in academia, public service, and business. The award is part of U.S. National Engineers Week, an annual event that aims to increase public awareness of science and engineering.

Tan is staff manager and distinguished engineer at the Mixed-Signal & Power Center at Northrop Grumman's Aerospace Systems division in Redondo Beach, Calif. He serves as product champion for the company's control electronics and power converters departments, where he is responsible for product strategy and cost reduction.

In addition, Tan is a visiting professor in the power electronics department at the University of California, Irvine. He is vice president of operations for the IEEE Power Electronics Society and belongs to the IEEE Industrial Electronics and Industry Applications societies.

IN MEMORIAM

J. BARRY OAKES

SATELLITE DESIGN ENGINEER, FORMER IEEE BOARD MEMBER

MEMBER GRADE: Life Fellow
AGE: 82
DIED: 1 May

J. Barry Oakes was an expert in satellite design and electronics at Johns Hopkins University's Applied Physics Laboratory, in Laurel, Md.

He joined the lab in 1951 as a clinical engineer and spent his career researching satellite design and electronics. He spent most of his time there as a supervisor in the lab's space department. Oakes became an assistant professor of biomedical engineering at the university in 1972, retiring in 1993 from both the lab and the university.

Co-author of *Linear Vacuum Tube and Transistor Circuits* [McGraw-Hill, 1960], Oakes spent significant time volunteering for IEEE. He was a member of the IEEE Instrumentation and Measurement Society administrative committee for 20 years beginning in the 1970s, and he served as the society's president in 1976, 1996, and 1997. He was also vice president of Educational Activities and a member of the IEEE Board of Directors, representing Division II.

Oakes received a bachelor's degree in 1949 from Rensselaer Polytechnic Institute, in Troy, N.Y. He earned a master's degree in physics in 1950 from the University of Michigan, Ann Arbor.

ROBERT D. ADAMS

POWER ENGINEER, FORMER IEEE REGION DIRECTOR

MEMBER GRADE: Life Senior Member
AGE: 75
DIED: 2 May

Robert D. Adams spent most of his career working in the power industry and was an active IEEE volunteer.

He began his career in 1958 at East Kentucky Power Cooperative, headquartered in Winchester, as an assistant systems operator. In 1969, he became an aerosystems engineer on the F-111 fighter-bomber aircraft at General Dynamics Corp., in Fort Worth, Texas. There he helped develop the aircraft's homing device. He left in 1971 to become a district engineer in power systems sales for Westinghouse Electric Corp., in Indiana and Illinois. In 1973, he joined Indianapolis Power and Light Co. as an underground major projects engineer. He left in 1975 to become supervisor of the Metering Standards Laboratory within the company's Special Testing and Demand Metering division. Adams retired in 1997.

He held several IEEE leadership positions, including director of Region 4, IEEE-USA secretary and treasurer, and director of the Central Indiana Section.

Adams received a bachelor's degree in electrical engineering in 1968 from the University of Kentucky, Lexington.

WILLIAM E. ENGELER

CHARGE-COUPLED DEVICE CO-INVENTOR

MEMBER GRADE: Life Fellow
AGE: 81
DIED: 13 May

William E. Engeler's inventions enabled the development of fax machines, medical imaging equipment, and digital cameras.

He began his career in 1951 as a design engineer for General Electric's semiconductor products department, in Niskayuna, N.Y., leaving in 1955 to serve in the U.S. Army. He returned to GE in 1961, beginning a 40-year career with the Research and Development Center, also in Niskayuna.

In 1967, Engeler filed a patent application with colleague Marvin Garfinkel for a silicon chip later known as a charge-coupled device, which takes in light rays and produces an electric signal. The two men were awarded a patent for the chip's storage process.

Engeler was on the team that invented the Epicon silicon diode array for a television camera tube, and he helped develop capacitor-storage technology applicable to digital television. He advanced the technology for fabricating high-speed integrated circuits and contributed to building the first high-power gallium arsenide laser.

Engeler received a bachelor's degree in physics from the Polytechnic Institute of Brooklyn (now the Polytechnic Institute of New York University) and a master's degree and Ph.D. in physics from Syracuse University, in New York.

CLOCKWISE FROM TOP LEFT: CHARLES REID; GALVIN/RENSSELAER POLYTECHNIC INSTITUTE; NORTHROP GRUMMAN; IEEE (2); KAREN EMMERICH

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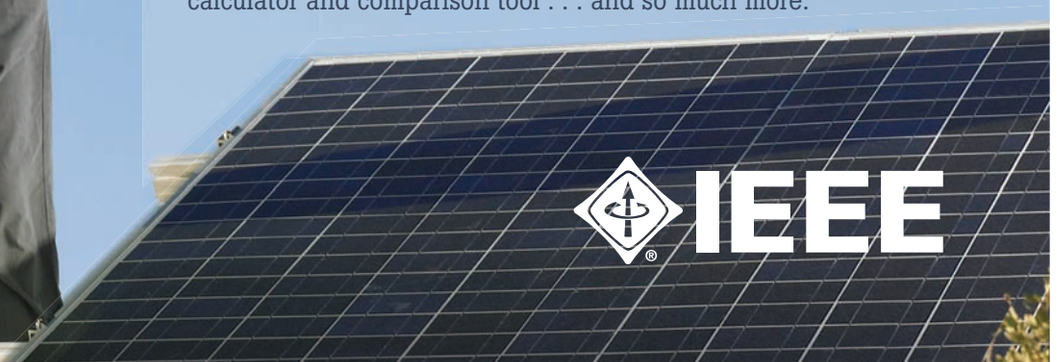

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