IEEE Foundation

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FOCUS

Transforming Lives Through Technology Together

President's Perspective

The IEEE Foundation seeks to transform lives through the power of technology and education and promote innovation on a global, field-changing scale. I am thrilled to see that the alliance between the Foundation and IEEE is addressing some of the greatest challenges facing the world today by:

- fighting global poverty by empowering off-grid communities through locally owned micro-utilities
- engaging engineering students to formulate solutions that address critical human needs in their communities and for their communities
- attracting the best and brightest students to power engineering, and
- driving efforts to educate young people about the history of technology.

Working together to leverage philanthropy for challenges such as these allows us to have an impact on the lives of thousands of children, college students, families and communities around the world.

Since my last report in the Foundation Focus, the IEEE Foundation Signature Programs have successfully launched and made significant progress. You can read about these IEEE-run public imperatives on pages 2 and 3.

The unique and life-changing projects conducted by young engineers and high school students are a source of pride for us all as we, the Foundation, in partnership with you, the donors, award scholarships to encourage young people to enter our profession and develop community-changing technologies. One story in particular stands out for me – Alex Tacescu's IEEE Presidents' Scholarship winning project. This 17-year-old student sought to ease the day-to-day difficulties of people with physical disabilities, and he did just that with "Project Maverick: An Omni-Directional Robotic Mobility System." Alex's invention has the potential to ease the lives of millions suffering with limited mobility. Alex and his project are highlighted on page 4.

Another standout moment for many of us in the IEEE community was the awarding of the IEEE Medal of Honor to Dr. Mildred H. Dresselhaus, the first female recipient in the history of the award. Her picture is on page 5. Millie Dresselhaus paved the way for the rise of nanotechnology and blazed a path for women in science and engineering. Known as the "queen of carbon science" for her life-long research into the properties of graphite and carbon-based materials, the era of carbon electronics can be traced back to her tireless and inspired research efforts. The IEEE Foundation is the proud sponsor of the IEEE Medal of Honor.

I invite you to read further to learn about the remarkable grants we funded and the community changing potential they represent, on pages 6 and 7. You will feel the excitement of the IEEE groups through their words.

On behalf of the IEEE Foundation Board of Directors and all those served through your generosity, I thank you and welcome you to continue on this journey with us to transform lives through the power of technology and education.

Respectfully,

Leah H. Jamieson

Leah H. Jamieson
IEEE Foundation President

Signature Programs: *The Heart of the IEEE Foundation's Mission*

Innovative IEEE Foundation Signature Programs go to the very heart of the IEEE Foundation's mission. Each Program delivers immediate impact coupled with long-term growth in intellectual capital, human resources capacity, and technological literacy.

PES Scholarship Plus Initiative Update

Power and energy engineers work with some of today's most exciting technologies, developing solutions to problems that affect our lives and lifestyles. The PES Scholarship Plus Initiative awards up to 3 years of scholarship money and provides real career experience through internships and cooperative programs to undergraduate electrical engineering students interested in the power and energy industries.

The Initiative brings together industry and academic stakeholders to directly address the power and energy workforce shortage by attracting qualified and talented students to the field. Since 2011, 466 scholars from 147 schools in the US and Canada have been awarded 733 scholarships. This year's application pool has more than 500 candidates vying for PES Scholarship Plus awards. To date, 181 PES Scholars have joined the power and energy workforce.

Bridget Davis, two-time PES Scholar, John W. Estey Outstanding Scholar, and employee of American Electric Power attended the annual Donor Reception to thank the 50 donors, program volunteers and scholars who came to celebrate the Initiative's success in doubling the number of undergraduate students entering the power and energy industry. While attending the event at the Power & Energy Society's General Meeting in Denver, CO, USA, Wayne Bishop of Omicron described how critical the Initiative is to their company by identifying talent early on. Wayne said that the company's first-ever intern was a PES Scholar and they are thrilled to continue to support the Initiative.

Learn more:
ee-scholarship.org

Project leader Ezabo Baron excites and empowers students during the EPICS in IEEE team strategic meeting.

EPICS (Engineering Projects in Community Service) in IEEE

It has been a very busy few months for EPICS (Engineering Projects in Community Service) in IEEE. The EPICS in IEEE committee approved new projects for funding, bringing the total to 64 projects in 20 countries around the world, in addition to designing an official EPICS in IEEE logo. Along with crafting a new look for the EPICS in IEEE Web site, committee members have been attending IEEE and non-IEEE global conferences to promote EPICS in IEEE (listed on page 3). Expected to launch in the fall of 2015, the new Web site will include an upgrade to the existing pages and the most exciting developments are elements that will promote a more dynamic online community for EPICS in IEEE.

Project Update Uganda: Community Projects for Economic Growth

IEEE volunteer, Ezabo Baron from the Uganda Subsection, is the current project leader for this EPICS in IEEE project. This project is a partnership with Makerere University, Kyambogo University, Entebbe Secondary School and the Humanitarian Innovation Technical Institute to develop a Web-based Science, Technology and Innovation Management platform.

The project began in March 2015 and the partners are now in the advanced stages of developing the full platform. The team held a successful final strategic meeting at Kyambogo University in August. The team's future plans include a week-long technical meeting at Makerere and Kyambogo University to build the final STI platform. Once that is completed, they will have another workshop aimed at training the students on the processes of innovation and invention. The project received US$5,670 in funding.

Learn more:
ieee.org/education_careers/education/preuniversity/epics_high.html

REACH (Raising Engineering Awareness/ Appreciation Through the Conduit of History)

REACH will Raise Engineering Awareness among high school students and increase their Appreciation of technology through the Conduit of History. Envisioned as multi-media modules on a focused topic, each enrichment lesson will aid teachers in explaining the development of the technology, who engineered it and how it changed the path of society.

The inaugural meeting of the IEEE History Center REACH Program's Teacher and Administrator Advisory Group was hosted by Manalapan High School in Manalapan, NJ, USA in May. Local educators provided significant input to expand and enhance the vision of REACH.

The new REACH program manager, Kelly McKenna, who began working at the IEEE History Center on 31 August is already formulating a strategic plan that will move forward REACH advisory groups, create a production calendar for the first enrichment module and collaborate with the IEEE Foundation development office in support of fundraising goals.

Learn more:
ieeefoundation.org/reach-through-history

Educators and IEEE History Center staff participated in the first meeting of the IEEE History Center REACH Program's Teacher and Administrator Advisory Group. All agreed that a tripartite concept of enrichment resource modules will engage students of various learning styles. Each topic will include an introductory video, milestone map and a hands-on lab activity.

India Delegation on July 29

Robin Podmore, co-founder of IEEE Smart Village, addressed more than 50 attendees of the India delegation during the 2015 PES General Meeting. Robin provided an update of IEEE Smart Village activities and collaborative partners in India. Attendees contributed in excess of US$5000 in donations and pledged support to the Smart Village Fund, managed by IEEE Foundation.

From left, Dan Wessner, Hardev Juj, Jay Giri, Robin Podmore, and Farid Khan discuss IEEE Smart Village at the IEEE Power and Energy Society India delegation in Denver, CO, USA.

IEEE Smart Village

Electricity is widely considered a key element for sustainable community prosperity and a means of eliminating extreme poverty. IEEE Smart Village addresses this profound need in a brand-new and sweeping way.

The IEEE Smart Village mission is to use renewable energy and technology to sustainably improve the lives of people in remote communities. Its vision is to enable partners to provide access to basic electrical services for 50 million people within 10 years. The initiative provides renewable-energy solutions and necessary funding to local entrepreneurs to build electricity companies, assists the local partners in establishing a sustainable business plan and delivers ongoing training. The entire community participates in the success of the local electricity business, and profits are reinvested in community empowerment through economic development and learning. The project was named Finalist in the 2015 Bloomberg New Energy Finance Summit's Finance for Resilience (FiRe).

IEEE Smart Village already serves about 50,000 people in 34 villages via pilots in Cameroon, Haiti, Kenya, South Sudan, and more. Building on the success of the proven pilots, the goal is to raise a minimum of US$10 million for the following:

- providing access to basic electrical services for 50 million people by 2025
- continuing innovation in the electrical systems being deployed
- using the success of the current pilots, a special effort to raise awareness and create excitement in schools and universities regarding the potential of engineering
- expanding partners involved, including governments, multinational corporations and foundations.

Learn more:
ieee-smart-village.org

EPICS in IEEE committee members attended conferences to promote IEEE and encourage IEEE members to develop EPICS proposals.

- Maciej Borowka made a presentation during the Central European Student Young Professional Congress in May in Zagreb, Croatia and also the 4th IEEE Iberian Student Branch Congress in Madrid, Spain in April.
- Supavadee Aramvith attended the IEEE Region 10 Student Young Professional/Women in Engineering Congress in July in Sri Lanka.
- Vaneeth Vijayaraghavan, an IEEE Volunteer, represented EPICS in IEEE during a conference held by EPICS Purdue in Coimbatore, India in July as well as the All India Student Young Professional Conference in Kerala.

Empowering Young Minds

The IEEE Daniel J. Senese Memorial Scholarship

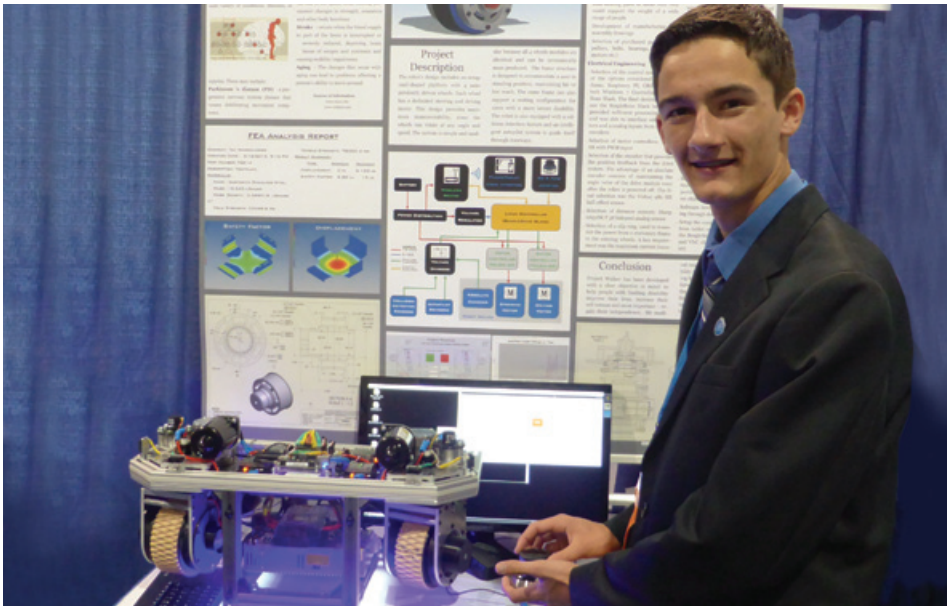
Each year, IEEE awards the IEEE Daniel J. Senese Memorial Scholarship, established as a tribute to former IEEE Executive Director Daniel Senese, to a senior attending Piscataway High School, Piscataway, NJ, USA. Kevin Jimenez, who plans to study aerospace engineering at Georgia Tech, received a US$1,000 scholarship and is the seventh annual recipient of the Senese Scholarship. The IEEE Daniel J. Senese Memorial Scholarship Fund provides funding for the scholarship to remember Daniel Senese's interest in fostering science and engineering education.

Presidents' Scholarship

17-year old innovator, Alex Tacescu of Fresno, CA, USA, set out in July 2014 to help his grandfather, who suffered from Parkinson's disease, and others with similar disabilities. He knew that two- and four-wheeled mobility walkers, along with wheelchairs, were slow and cumbersome, requiring much effort and allowing users' leg muscles to atrophy. They also force disabled people to sit in a world that is otherwise standing. He thought he could improve on the design.

Alex's "Project Maverick: An Omni-Directional Robotic Mobility System" was presented at the Intel International Science and Engineering Fair in Pittsburgh, PA, USA in May and won the US$10,000 IEEE Presidents' Scholarship. Alex's project will let users stand upright while moving around on a wheeled, motorized, 0.6- by 0.6-meter platform. Its top speed would be about 5 kilometers per hour, comparable to preferred walking speed. As conceived, it's akin to a Segway but more stable, with four wheels instead of two, each powered by two independently controlled motors for steering and driving. Alex also incorporated a Linux-based controller that enables features such as collision detection and auto-piloting through tight spaces.

Although his grandfather passed away last year, Alex kept working on his design. His efforts paid off with the award. Administered by IEEE Educational Activities, the annual scholarship is given by the IEEE Foundation to a high school student who creates a project that demonstrates an understanding of electrical and electronics engineering, computer science, or another IEEE area of interest.



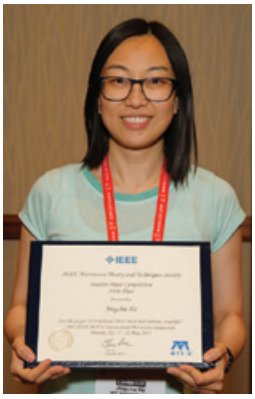
For Alex, his passion has only been enhanced by the recognition he received from IEEE. "An incredible honor," he calls it. "It tells me that this is the right career choice for me and brings me to a whole new level." He hopes his project will soon help improve people's lives.

IEEE HKN Student Leadership Conferences

IEEE Eta Kappa Nu's (IEEE-HKN) annual Student Leadership Conference, a premier event for the society, is an opportunity for IEEE chapters to meet with other officers, members, faculty advisers, members of the Board of Governors, and staff. The conference includes opportunities for professional development, leadership training, and networking.

The 2015 Student Leadership Conference was held on 20-22 March by the Mu chapter at the University of California, Berkeley, CA, USA. More information about the 2015 and 2016 events can be found on the 2015 event page at slc2014.hkn.mu and on the IEEE-HKN Facebook page.

Harold Sobol Travel Grant



Congratulations to Jingchu He, the 2015 recipient of the Harold Sobol Travel Grant, in recognition of her paper, "A Wideband 700W Push-Pull Doherty Amplifier". Her work was chosen to win the 2015 IEEE International Microwave Symposium Student Paper Competition held during the symposium in Phoenix, AZ, USA.

Recognition of Innovation

The 2015 IEEE Honors Ceremony "Forward" was held on 20 June, at the Waldorf Astoria, NYC, USA. Each year leading engineers, scientists, and technologists from around the world gather at the Honors Gala to celebrate the people and advancements that have shaped our modern society. This year, IEEE President Howard Michel served as the Master of Ceremonies along with co-presenter IEEE President-Elect Barry Shoop.

Medal of Honor Winner, Dr. Mildred S. Dresselhaus, celebrating her achievement with IEEE Foundation President Leah Jamieson (second from left), IEEE President Howard Michel (right) and IEEE President-Elect Barry Shoop (left).

A highlight of the ceremony is the presentation of the IEEE Medal of Honor which is sponsored by the IEEE Foundation. This year, the IEEE Medal of Honor was presented to Mildred S. Dresselhaus, Life Fellow, IEEE and Institute Professor, Massachusetts Institute of Technology, Boston, MA, USA. Dr. Dresselhaus, the first female IEEE Medal of Honor recipient, was recognized "for leadership and contributions across many fields of science and engineering."

The ceremony honored an additional 24 IEEE Medal and Award winners. The Gala was simultaneously broadcast to IEEE members worldwide and is now archived online for posterity on ieeetv.ieee.org.

Congratulations to IEEE Smart Village Co-Founder Ray Larsen, recipient of the 2015 IEEE Richard M. Emberson Award, pictured here with two previous winners, Wanda K. Reder and Leah Jamieson. Reder and Jamieson were also recognized for founding Foundation Signature Programs (pages 2 and 3).

IEEE Foundation Board members Lyle Feisel and John Impagliazzo enjoy the festivities at the IEEE Honors Ceremony.

Board Members Join Growing Ranks of the Donor Heritage Circle

With congratulations and sincerest thanks, the IEEE Foundation welcomes three Board Members to the **IEEE Heritage Circle** – Eleanor Baum, Wanda Reder and John Treichler. *Honored Philanthropists* of the **IEEE Heritage Circle** are individuals whose donations to IEEE total US$10,000 or more since 1 January 1995. Automatically recognized as members of the **IEEE Heritage Circle**, donors are categorized respectively within five named giving levels ranging from US$10,000 and more.

Board of Directors

The IEEE Foundation Board of Directors welcomes Professor Teck-Seng Low, Chief Executive Officer, National Research Foundation in Singapore, as a director for a three-year term to commence 1 January 2016.

John Meredith was named an Emeritus Board Member. Emeritus members of the Board are former IEEE Foundation Directors who made extraordinary contributions to the IEEE Foundation through their devotion of time, expertise, special initiatives, and service.

The Robot Mobile Lab: A New Experience for the Egyptian Education Community

By Eng. Marwa Soudi, Junior Activities Chairman, IEEE Egypt RAS, National Organizer, World Robot Olympiad of Egypt

With the support of the IEEE Foundation, a group of professional engineers, in partnership with Ideas Gym science center, IEEE RAS Egypt, Egyptian Ministry of Education, Microsoft Egypt and Social Development Egyptian NGOs inspired young Egyptians from 9 to 17 years of age to be involved in engineering projects for kids.

With the support of the IEEE Foundation Grants Program, the group had a great chance to design what they named "Robot Mobile Lab (RML)." RML includes a set of LEGO Mindstorms Robots, electronics and mechanical components and a unique program developed by the group. The idea was to engage students and teachers in a multidisciplinary approach in robotics including math, physics, programming and engineering. In a country like Egypt where the access to such educational kits is limited due its high price compared to the country's economic state, the Mobile Lab was a great solution allowing the involovement of thousands of students and teachers.

The head of the group, Marwa Soudi, is one of the IEEE Egypt Women in Engineering founders, and made it a priority to engage as many females as possible in the field so that the number of girls participating was almost 50%. The group even gave workshops for girls only during Microsoft DigiGirlz Day. Also, an increasing effort was made to engage vocational students in the field and to raise awareness about engineering careers. What is really amazing about the program is that its work continues and will keep working to involve more and more students and teachers for at least the next five years. Thanks to the IEEE Foundation, who believed in our group; without you we couldn't make it.

Above and Left: Students work with the Mindstorms Robots at a Mobile Lab.

IEEE Standards Massive Open Online Course

By Susan Tatiner, Director, Standards and Technology Policy Education, IEEE Standards Association and Jennifer McClain, Senior Manager, Standards Education & Business Development IEEE Educational Activities

Technical standards affect the daily lives of millions of individuals around the world. Developed at the intersection where technology meets economics and politics, technical standards influence how people across the globe communicate, work, and live. The IEEE Standards Education Committee, a joint standing committee of the IEEE Standards Association Board of Governors and the IEEE Educational Activities Board, received an IEEE Foundation Grant in December 2014 to fund the development of a Massive Open Online Course (MOOC) on standards.

The course, "Innovation and Competition: Succeeding through Global Standards," is designed to offer a practitioner's view of standards and standards development. It is aimed at graduate-level students, educators and new professionals in the fields of engineering, technology, and computing (ETC), business, economics, and law. For professors who seek to bring industry and standards expertise into the classroom, the MOOC can be a vehicle for introducing these skills. The course aims to help students compete more effectively in the global economy.

Launching in 2016, the course will be delivered over 6 weeks at IEEEx.org on the edX.org platform. The Standards MOOC will offer a comprehensive survey of fundamental standardization themes that will increase the recognition and understanding in engineering professionals of the critical role standards play in global trade, society, product design and planning, and strengthen their ability to support standards work.

The IEEE Standards Education Committee's MOOC is uniquely positioned to help students around the world develop practical and lasting skillsets around technical standards. Part of the IEEE Standards University, currently under development, the MOOC brings standards education to a large global audience that has come to not only trust but also rely on IEEE for leadership in technological and standards excellence.

Look for the course "Innovation and Competition: Succeeding through Global Standards," on IEEEx.org in early 2016.

Learn more:
standardseducation.org.

Public Lighting for Vulnerable Communities

By Ana Salazar, IEEE Member

The Granizal community is the largest settlement of a displaced population in the metropolitan area of the Aburra Valley in Antioquia and the second largest in Colombia. It is located in a rural area of the municipality of Bello. It is estimated that Granizal has been inhabited by about 28,000 people for 20 years. The community is categorized as an "urban expansion area" of the municipality. The irregularity of this property prevents investment in infrastructure. Health conditions and infrastructure are precarious: the houses are built mainly from wood and cardboard, there is no access to clean drinking water in the area, and the absence of sewage infrastructure for wastewater disposal increases the risk of landslides. In addition, there is no street lighting service.

For this community, the darkness is a symbol of fear and danger, life is at risk because the roads to go home are difficult to access. Simply, life is different once the sun goes down. In this vulnerable community, the street lighting project is being developed with the support of IEEE Foundation, IEEE Colombia Section, IEEE Medellin Subsection, and other funders. The project will provide at least 3 kilometers of roads illuminated using solar power poles, with the active participation of the community.

The Community of Granizal learns to create, maintain and replicate their own light poles.

Several workshops on cooperation with the community were conducted, where they are taught to create their own light poles, empowering them to properly maintain and replicate the light poles if necessary. The project seeks to strengthen the community work to promote the use of sustainable energy, create economies of scale, save CO_2 emissions, reduce traffic accidents in areas that are dark and most importantly, reduce violence in the intervention areas. Once the project is finished, the idea is to measure the impact of the solution through the number of violent events, the sense of security, income generation and number of accidents. The baseline indicators will be compared to the conditions after the implementation of the project.

The current conditions in Granizal leave many opportunities for improvement. By actively engaging the community in its own development, the public lighting program promises to bring more security and safety to 28,000 Columbians.

Planned Generosity

By Stan H. Retif, IEEE Foundation Chief Development Officer

As Americans age, the so-called 'baby boomers' are retiring and the wealth that they have accumulated over the course of a lifetime is being transferred to their heirs. Experts predict the potential of this transfer to reach more than US$10 trillion dollars.

As a result, Baby Boomers have an incredible opportunity to structure gifts that lessen the tax burden for their heirs, while simultaneously offering support to the nonprofits they value. IEEE Foundation is prepared to help eligible donors take advantage of this opportunity.

Giving takes many forms. A structured, or planned gift, is typically defined as a gift that is made from accumulated wealth. These gifts, by design, are not intended to come from current income.

Though planned giving may result in tax benefits, most important is the donor's interest in advancing the mission of the IEEE Foundation.

Planned gifts are usually considered gifts that will be made at some point in the future, however, some are actually of an immediate nature. Gifts involving real estate or appreciated securities and distributions from IRA holdings would fall into this immediate category.

Other planned gifts are of a deferred nature. The most common of these type gifts are made via bequests. Annuities, charitable remainder trusts, unitrusts, wealth replacement trusts, etc., would be other examples of deferred planned gifts. Through these vehicles IEEE Foundation will benefit at some future time.

Periodically, the IEEE Foundation will provide information regarding planned giving, which may be of interest to you or a loved one. Given the complex nature of some of these instruments, it is always recommended that you consult your own tax, finance and legal advisors. Should you have questions regarding planned giving to the IEEE Foundation, please contact Stan Retif of the IEEE Foundation at s.retif@ieee.org.

Giving Tuesday

The IEEE Foundation is excited to promote #GivingTuesday, an effort that harnesses the collective power of a unique blend of partners—charities, families, businesses and individuals—to transform how people think about, talk about and participate in the giving season. On Tuesday, 1 December 2015, we encourage IEEE Members around the world to come together for one common purpose: to celebrate generosity and to give. Connect with us on social media for updates on #GivingTuesday.

IEEE Foundation

As the philanthropic arm of IEEE, the IEEE Foundation is a leader in transforming lives through the power of technology and education. The IEEE Foundation enables IEEE programs that improve access to technology, enhance technological literacy, and support technical education and the professional community.

The IEEE Foundation, a tax-exempt 501(c)(3) organization in the United States, fulfills its purpose by soliciting and managing donations, recognizing the generosity of our donors, awarding grants to IEEE grassroots projects of strategic importance, supporting high impact Signature Programs, serving as a steward of donations that empower bright minds, recognize innovation and preserve the history of technology. With donor support, the IEEE Foundation strives to be a leader in transforming lives through the power of technology and education. Charitable contributions to the IEEE Foundation are tax deductible to the fullest extent allowed by law in the United States. For other countries, please check with your local tax advisors.

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