

The President's Perspective

It is an honor to serve the members of the IEEE as the new President of the IEEE Foundation. It was a special privilege to serve as the Centennial President of the IEEE and I remain dedicated to the recognition of the traditions of excellence of the IEEE. We continue to build on the shoulders of the many giants who developed the technologies and services that enable the improvement of the quality of life for people throughout the world. The IEEE Foundation is uniquely positioned to continue to develop the additional resources to broaden the services provided by the many organizational units that are the IEEE.

My participation in the IEEE Foundation as a member of the Board for the past three years and the Vice-President, Development for the past two, have helped me better understand the exceptional capabilities of the IEEE Foundation. During that time, I served under the able leadership of Emerson Pugh. On behalf of the IEEE Foundation Board, I thank Emerson for all his hard work and dedication. During his five years as President, he generously gave his time, wealth and wisdom to create the IEEE Foundation of today. I look forward to building upon his efforts, and those of previous IEEE Foundation Boards, as we move into the future.

to improving the services we presently support, these two on-line systems will provide the IEEE Foundation with a web-based archive of documents so we can more efficiently manage the use of Foundation resources for the IEEE.

“I take this opportunity to express my gratitude to the many who provide support through the IEEE Foundation.”

On behalf of the many people throughout the world who benefit from the many activities of the IEEE, I take this opportunity to express my gratitude to the many who provide support through the IEEE Foundation. It is because of their monetary investment in our program, that we are able to carry out the mission of the IEEE Foundation to further the scientific and educational goals of the IEEE. These individuals, organizations, and foundations are the driving force behind our success.

I look forward to learning of your vision for the IEEE Foundation and encourage you to call me or send an email. Please contact me or any of the members of the IEEE Development Office, at +1 732.562.3915 or send an email to supportieee@ieee.org.

The members of the IEEE Foundation Board of Directors join me and the Foundation Staff in thanking you for your continued support of the IEEE through the IEEE Foundation. We share our best wishes for a joyous new year.



Richard (Dick) Gowen (right), 2005 President, IEEE Foundation, and Emerson Pugh (left), Past President, IEEE Foundation, smile for the camera during the 2004 IEEE Honors Ceremony.

As one of my first official activities, I am proud to announce that the IEEE Foundation is now using the Internet to conduct business. Thanks to the hard work of several of our Board Members, Bob Alden, Pete Lewis, and Rolf Remshardt, as well as Glenys Gotthardt, the IEEE Foundation Senior Administrator, we have unveiled web-based grant application and project reporting systems. In addition

Richard J. Gowen
2005 President
IEEE Foundation

Engineering Students Exhibition – 2004

By: Kevit Desai, IEEE Member

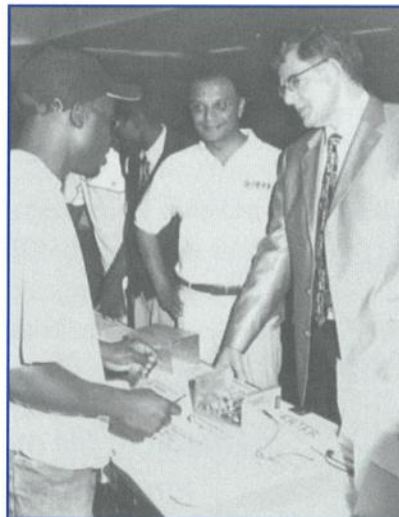
On 16 October 2004, the IEEE Kenya Section hosted the **Engineering Students Exhibition – 2004**, which was funded in part by a grant from the IEEE Foundation. This all-day event, held at the Sarit Centre in Nairobi, Kenya, Africa, was open to students taking electrical engineering or computer science courses. Participants in the event were instructed to show ingenuity in developing their projects. They were required to prepare a project summary, create a presentation using appropriate aids and be able to demonstrate how their project functioned.

Thirty-eight entries were received for the competition from students representing schools from Kenya and South Africa. The projects were broken down into two categories:

- 1) Electronic Engineering and
- 2) Information Communication Technology.

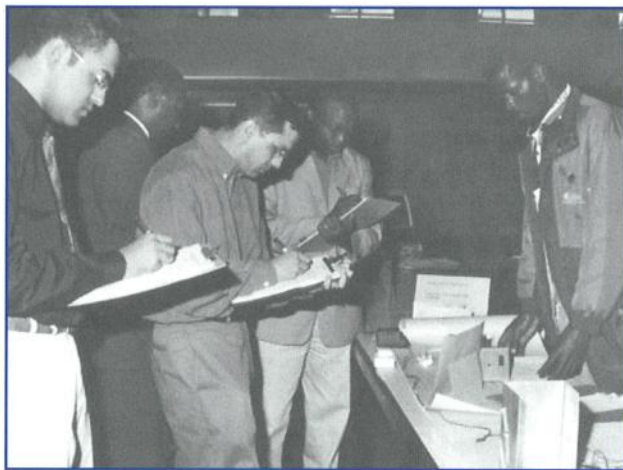
Mark Pikker from Cape Technikon University, South Africa won in the Electronic Engineering category for his project entitled "Automated Solar Tracking System." Hezbon Ongira from

Moi University, Kenya won in the Information Communications Technology category for his project entitled "Hotel Management Website." Each winner received a trophy and other prizes donated by industrial companies in Kenya.



The judges evaluate one of the projects during the competition.

The judges watch a student as he demonstrates his project.



Kevit Desai, Exhibition organizer (middle) and Prof. Gohard Hancke, Guest of Honor (right) visit with a student during the Exhibition.



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Scientific American Picks IEEE Virtual Museum as a Top Sci/Tech Web Site –

Every year the editors at *Scientific American* pick the top science and technology sites on the web to receive its **Science & Technology Web Awards**. This year, the IEEE's very own IEEE Virtual Museum (VM) was among the 50 sites selected. They describe the VM as "a beautifully designed Web site featuring a cornucopia of exhibits encompassing topics as wide-ranging as microelectronics, women and technology, and microwaves."

This is just the latest in a long line of accolades for the IEEE Virtual Museum, a project funded in part by the IEEE Foundation. Take a moment to visit the IEEE Virtual Museum at www.ieee.org/museum and learn first hand just how special it is.

Society at Large — The Third Beneficiary of Mentoring

By Walter E. Myers, PE — IEEE Life Senior Member

Three segments of society realize the synergistic benefits from mentoring. When looking at each individually, it is easy to see how the benefit extends to the other two.

The first beneficiary of mentoring is the apprentice: The most direct and best recognized benefit of mentoring accrues to the individual students who gain an early insight to a field of interest. Whether the experience whets their appetite for the field or cools their interest, it serves them well in the efficient use of their time and resources in planning and realizing their future careers.

The second beneficiaries of mentoring are the mentors and their employers: Equally important benefits accrue to the mentor and their employer. Mentors have the satisfaction of helping a student succeed. More practically, mentoring provides an opportunity to refresh the mentor's understanding of the basic principles of their discipline to effectively teach them to an apprentice. Younger mentors also have an opportunity to begin development and application of supervisory skills.

Employers who reach into the pipeline to help develop the future technology workforce put themselves at the front of the line for recruiting these students when they enter the job market.

The third beneficiary of mentoring is society at large: The most difficult benefit to quantify is that which society realizes. However subjective, those of us who have benefited from or witnessed a mentoring experience cannot deny the broader benefits to society both tangible and intangible. Mentoring activities that

reach the broader demographics of students help break the stereotype of who can be the scientists and engineers of the future. At the same time they draw in to the science professions the gender and cultural diversity necessary to address our future health, productivity, energy and environmental needs with a perspective more representative of the whole population.

*“better prepared students
make the best of
the resources”*

More specifically, better prepared students make the best use of the resources of our academic institutions without so many changes in career directions and delays in matriculation.

Involving practicing professionals in the education pipe line provides an augmentation to the more formal curriculum of our pre-university education system for students interested in the sciences. The students realize the relevance of their formal curriculum when they experience the application to real tasks.

Enter the IEEE Foundation: A good example of IEEE support of mentoring is embodied in a just completed three-year grant to the *Apprenticeships in Science and Engineering (ASE) Program* at Portland State University. Over the three year grant, which just recently ended, the IEEE Foundation enabled the opportunity for seven high school students to work in the electrical/electronic engineering discipline field. To learn more about the ASE Program visit www.aseprogram.org.

2004 APPRENTICES FUNDED AND CO-FUNDED BY THE IEEE FOUNDATION

Jeff Rice

Sweet Home High School — Sweet Home, OR, USA.
(co-funded by Eugene Water & Electric Board)

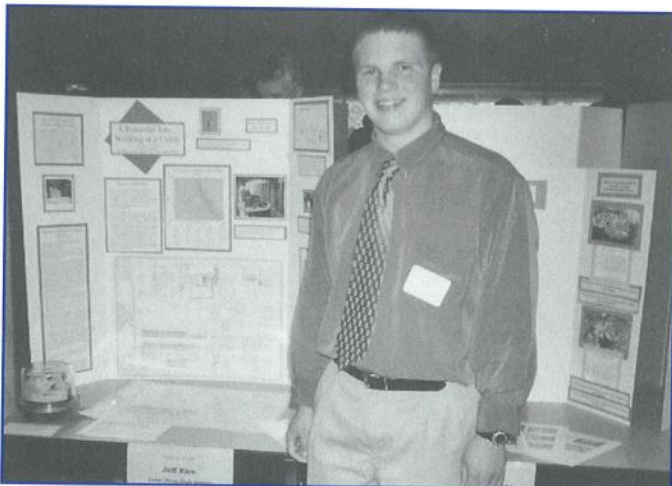
Mentor: — Mr. Rod Price, PE, IEEE Member,
Eugene Water & Electric Board

Jeff Rice worked with Mr. Rod Price at the Eugene Water and Electric Board (EWEB) on a project to standardize all aspects of substation design, particularly in regards to protective relaying. Throughout his apprenticeship, Jeff created approximately 25 of these standards, describing the protective relays, by modifying existing prints (schematics). He used the powerful “Small World” program to trace lines from feeder to fuse in order to find places where a larger fuse may go out before a smaller one during maximum fault current. Identifying and eventually correcting these situations will help to further minimize the extent of power outages. In another project, Jeff compared three different types of meters and showed how some meters slow down with age, causing EWEB to lose revenue over time. Jeff said of the apprenticeship, “The only person more excited than me about my apprenticeship was my dad (an electrical engineer).”

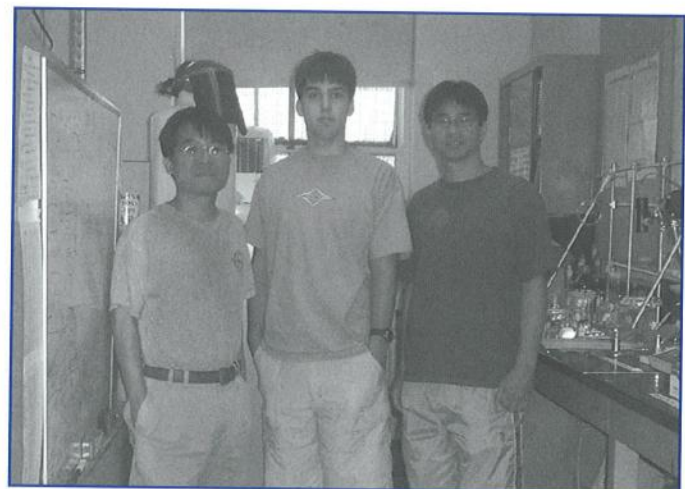
Christopher Breeden

Marist High School, Eugene, OR, USA.

Mentor: — Dr. Chih-hung Chang, IEEE Member,
Oregon State University, Department of
Chemical Engineering



Jeff Rice shows off his project poster board during the ASE Annual Symposium held on 21 August 2004.



Christopher Breeden (Center) gained valuable life skills by working with his mentor Dr. Chih-hung Chang (left) and Yu-jen Chang (right) in this laboratory at Oregon State University.

Preserving the Legacy of the Proceedings in the IEEE

By: **Jim Calder**, Managing Editor, PROCEEDINGS OF THE IEEE

Dr. Chang's laboratory is studying soft lithography, which is a relatively new method for the fabrication of micro and nano structures. These structures are created with an elastomeric stamp made of polydimethylsiloxane (PDMS). The stamps have patterned relief on the surface that generates the features. In practice, features as small as 5nm have been generated through this process. Soft lithography is a general term that describes several related printing techniques; the one that Christopher Breeden focused on was Microcontact Printing (μ CP). Christopher also had two side projects in which he worked with Photolithography and Chemical Bath Deposition (CBD) using a CdS solution. He says he "wouldn't have learned all these skills any other way," and he wants to become an engineer.

Robert J. Zaworski (RJ)

Corvallis High School, Corvallis, OR, USA, (co-funded by an IEEE Oregon Section member)

Mentor: Dr. Ronald Metoyer, Oregon State University, Department of Computer Science

Robert Zaworski worked in Dr. Metoyer's lab, along with Fayaz Seifuddin, a student from Linfield College, to create a crowd simulator from scratch. This crowd simulator can be used for studying an evacuation or simply to study the flow of people through an area. They designed a user interface that allows the user to set up any site or location, for example a building or a park block. RJ estimated that the project was 3/4 complete at the end of his apprenticeship. He learned QT, as well as how to document a project and work in a group.



Robert Zaworski (left) learned how to work as a member of team during his apprenticeship at Oregon State University. Here he poses for the camera with his fellow team members Ledah Casburn (center left), Fayaz Seifuddin (center right), and his mentor Dr. Ronald Metoyer (right).

For 92 years, *THE PROCEEDINGS OF THE IEEE* has been the leading authoritative resource for in-depth research coverage, tutorial information, and reviews of electrical and computer engineering technology. It has published the works of many extraordinary visionaries. The authors are a virtual "Who's Who" directory of 20th Century innovators, including the likes of Armstrong, Zworykin, Marconi, DeForest, Hopper, Shannon and Mauchly.

Currently, there is no permanent and readily available electronic file of this journal, which chronicles a key technological slice of engineering progress and innovation, not only of the IEEE, but of global technological progress of the 20th century. The primary research material is the deteriorating paper copies that are available in select libraries in several locations worldwide.

To preserve this important unique historical record and legacy of the profession, IEEE launched the **PROCEEDINGS OF THE IEEE Legacy Project**. Using a two-phased approach, the project will create an electronic archival library of *PROCEEDINGS* from 1913 through 1987. During Phase One, scheduled to be completed early in 2005, the *PROCEEDINGS* from 1963 through 1987 will be digitized. Phase Two, expected to be completed in early 2006, will

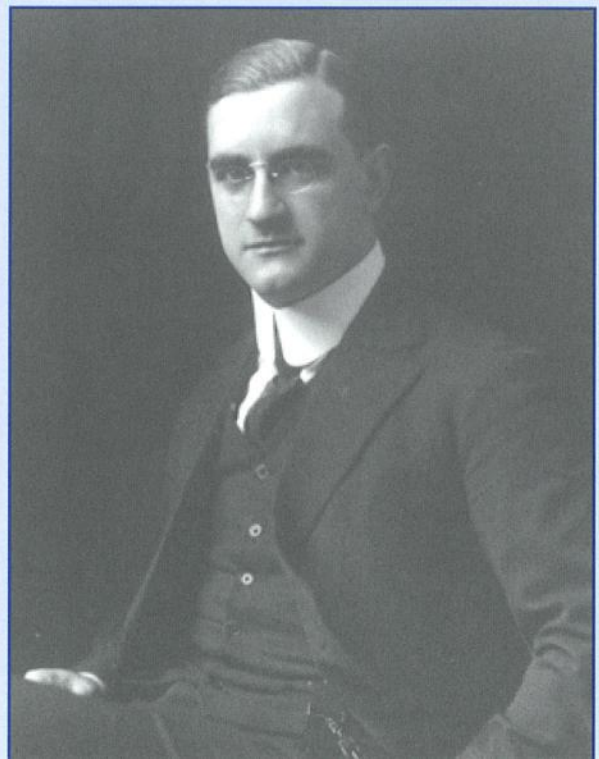
include the volumes published as *Proceedings of the IRE* (a predecessor society to the IEEE) from 1913 through 1962.

“Scientific and engineering progress is an unbroken continuum which has always been built upon the accomplishments and breakthroughs of visionaries who have gone before us.”

The IEEE Foundation is funding approximately one-third of the total cost of the project. When the project is completed, approximately 110,000 pages will be added to the *IEEE Xplore* system for study, research and reference by IEEE Members and other interested investigators from around the world.

Scientific and engineering progress is an unbroken continuum which has always been built upon the accomplishments and breakthroughs of visionaries who have gone before us. This **Legacy Project** will yield enormous educational and technical insights by making this fascinating legacy a permanent part of the technical literature.

The first issue of the *PROCEEDINGS* was published in January 1913, with Alfred N. Goldsmith as the editor. Dr. Goldsmith continued in that post for 41 of the next 42 years, stopping briefly to serve as the President of the Institute of Radio Engineers (IRE), a predecessor society to IEEE, in 1928.



Standards in Education

By: Theodore Bickart and Gerald Peterson, Co-Chairs, IEEE Standards in Education Task Force

In the mid-1990s, the IEEE Educational Activities Board and Standards Association successfully sought and secured a new requirement in the major design experience called for in the ABET criteria for accreditation of undergraduate engineering programs in the United States. The respondents encouraged the creation of web-based tutorials using case illustrations and a reference guide to standards.

About ten years later these two operating units of the IEEE came together again and formed the IEEE Standards in Education Task Force (SETF). The goal of SETF is to help the electrical and computer engineering undergraduate programs incorporate standards into the learning process. A grant from the IEEE Foundation was sought and supported for a "needs" survey and the development of proof of

concept learning products during 2004 and 2005. Through the survey, we identified the roadblocks to the introduction of standards into the undergraduate learning process, namely: (1) the scarcity of learning supplements to classroom instruction that would impart essential knowledge about standards and (2) the cost of access to appropriate standards. The respondents encouraged the creation of web-based tutorials using case illustrations and a reference guide to standards.

In response to the survey results, SETF is:

- (1) Producing a general tutorial on standards;
- (2) Scripting a wireless domain tutorial, the first of many domain tutorials;
- (3) Creating, the first of several, illustrative cases associated with the wireless domain tutorial

using a wireless router and a multimode cell phone;

- (4) Designing the structure for a reference guide; and
- (5) Planning the structure of an integrating web site for access to the general tutorial, domain tutorials, illustrative cases, and the reference guide. This web site will also include links to the web sites of the IEEE Standards Association and other standards development organizations.

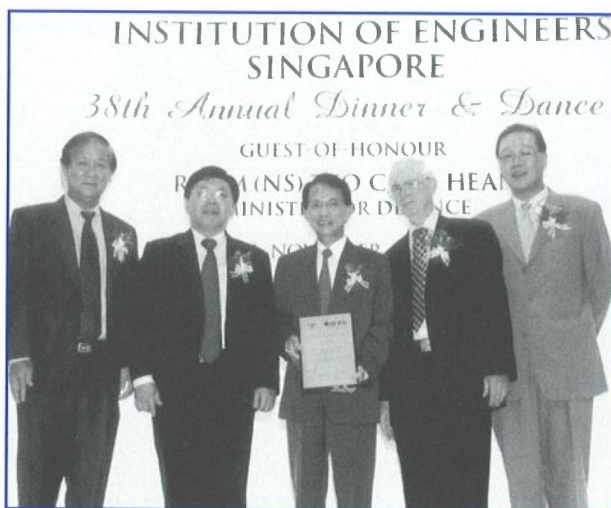
These web-resident learning products will be pilot tested at two academic institutions in 2005 and, after any refinements based upon the pilot testing, the web site will be made available on an open-access basis.

Working Cooperatively to Recognize Engineering Excellence

By: Karen Galuchie, IEEE Development Office

During the Annual Dinner & Dance of the Institution of Engineers, Singapore (IES) on 5 November 2004, the IES and IEEE jointly presented the second *IES/IEEE Joint Medal of Excellence Award* to Professor Chang Chieh HANG. Professor HANG, a faculty member from the National University of Singapore, was recognized for "outstanding contributions to Engineering Education, and to Research and Science / Technology Management in Singapore."

the IEEE Foundation funded *IEEE Joint National Society Awards Project*. Under the direction of Ted Hissey and Tom Cain, the *IEEE Joint National Society Awards Project* seeks to create cooperative ventures between the IEEE and national societies throughout the world that recognize and encourage engineering excellence.



Chang Chieh HANG (center) accepts the second *IES /IEEE Joint Medal of Excellence Award* from Yong Tian CHEW, IES Past President (left), Say Wei FOO, IES President (second left), Raymond FINDLAY, 2002 IEEE President (second right), and Teck Seng LOW, 2002 IEEE Region 10 Director (right).

Established in 2001, the *IES/IEEE Joint Medal of Excellence Award* is given in recognition of a professional whose contributions in the fields of electricity, electronics, computer science and systems, management, and/or related fields have made a great beneficial impact to society. This is one of the three awards established as a result of

IEEE Foundation Announces Online Grant Application

Grant seekers now have a new way to apply for a grant from the IEEE Foundation. Effective in 2005, the IEEE Foundation will be accepting grant applications through its new, simple-to-use online form. As in the past, the IEEE Foundation will consider projects that:

- Improve education in mathematics, science and technology from pre-university through continuing education;
- Preserve, study, or promulgate the history of IEEE-associated technologies;
- Recognize major contributions to these technologies and their applications; or
- Show promise of making a major contribution to the worldwide communities the IEEE serves or significantly advancing the profession.

The IEEE Foundation will be considering unsolicited applications in three rounds during 2005. The deadline dates are as follows:

Applications due	IEEE Foundation Meeting Date
January 7, 2005	March 11, 2005
April 15, 2005	June 17, 2005
September 16, 2005	November 18, 2005

To learn more about the IEEE Foundation's grant guidelines, and to submit an online application, visit <http://www.ieee.org/foundation>.

To Give Something Back

By: **Michael Deering**, IEEE Development Office

Involvement in the IEEE Power Engineering Society (PES) began early in the career of Murty Bhavaraju. He found this affiliation quite useful in completing his Ph. D. at the University of Saskatchewan, Canada in the mid 1960's.

Since those early days, Bhavaraju focused more than 35 plus professional years in: power system planning, with a focus on reliability; achieving international recognition for contributions to electric utility system planning; R & D, and professional work. Now recently retired from a lifetime of distinguished service to Public Service Electric & Gas (PSE&G), Dr. Bhavaraju decided it was the appropriate time to show the breadth of his gratitude to IEEE-PES by making a *US\$15,000* gift to the ***PES Award Endowment Fund***.

When asked why he was compelled to give to the ***PES Award Endowment Fund***, Bhavaraju said, "I felt the minimum I can do as an individual is to contribute a modest amount to the ***PES Award Endowment Fund*** in appreciation of all the

benefits I got from my involvement with the IEEE organization". He went on further to explain "I was very fortunate in the beginning of my career with PSE&G to have managers who encouraged my IEEE activities, including reviewing, publishing, and discussing papers, as well as participating in committee work. These IEEE activities provided tremendous benefits to my career at PSE&G in terms of innovation in the work, other professional opportunities, and career advancement. In addition, every year I have admired the achievements of the award recipients honored for their hard work and achievements during the PES Awards Luncheon. I believe peer recognition of this nature is an integral part of the role of IEEE-PES."

A number of very significant and highly visible awards are funded through contributions like Dr. Bhavaraju's gift to the ***PES Award Endowment Fund***. The awards are given annually during the PES General Meeting, and recipients are listed in the Power & Energy Magazine and distributed to members worldwide. If you would like more

information on how you too can become a *Founding Benefactor of the PES Award Endowment Fund*, please contact the IEEE Development Office at +1 732.562.3915.



Upon retiring after 35 plus years with PSE&G, Murty Bhavaraju wanted to acknowledge the positive role IEEE-PES played in his career and give something back by contributing *US\$15,000* to the ***PES Award Endowment Fund***.

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