A Closer Look at Engineering Careers

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www.hkn.org
Dear HKN members,

The end of a year always provides an opportunity to review the year's accomplishments and develop plans for the future. As I look back on 2007, I see many accomplishments of which all HKN members should be proud.

In the spring, HKN and the IEEE cooperated in a project that resulted in the updating of personal contact information for nearly 2,600 HKN members. This will enable us to reach many of our members whose addresses were outdated and for whom we did not have e-mail addresses. We hope this additional access will allow us to reconnect with those who have lost touch with HKN.

Over the summer we partnered with Experisite Inc., a career database. This partnership offers value to all members of HKN. Professional members of HKN can post jobs to other HKN members at no cost. Companies can target their job opportunities to HKN members, ensuring that the brightest electrical and computer engineers are seeing their ads. Visit the HKN Web site (www.hkn.org) to see all that this partnership has to offer.

The awards program continues to recognize outstanding individuals for their contributions in the fields of electrical and computer engineering. The profiles of three new Eminent Members are included in this issue.

This fall the chapter at the University of California Berkeley and Gamma Theta chapter at the University of Missouri-Kansas City held student leadership conferences. Each was enthusiastically received, and we congratulate the members of these chapters on a job well done. We also wish to thank all alumni and corporate sponsors, whose support of these student activities allowed students to participate in these events at no charge. We will continue to seek your support as more opportunities for student activities develop.

I hope you enjoy this issue of THE BRIDGE, which features articles that today's students as well as today's professionals will find useful.

Finally, we know that HKN members are engaged in a variety of technical as well as social activities; many are entrepreneurial and adventurous with a story to tell. We know that others, especially our students, will be inspired by your accomplishments, and we will occasionally share such experiences with our readers in the future. You can e-mail your story to me at admin@hkn.org or to THE BRIDGE Editor Barry Sullivan at editor@hkn.org.

Warm regards,

Roger L. Plummer
Executive Director

LETTER FROM THE EDITOR

Barry J. Sullivan | Beta Omicron Chapter Member

The last issue of THE BRIDGE addressed the evolution of engineering education. In the current issue, we explore a few of the many directions the career launched by that education can take. We cannot capture all the variety in a single issue in this topic, but we do present a broad range of experiences.

Lyle Feigel proposes “Lyle's Law of Mutuality,” highlighting the importance of matching team goals with those of the individual members. Finally, Richard Gowan, HKN Eminent Member, reflects on a career that has included roles as a researcher, manager, educator, and administrator.

We also introduce a new section on Member Profiles in this issue, offering the opportunity for members to share lessons learned from their careers. If you are interested in contributing an article or a profile, see Page 21 for more information and drop me a note at editor@hkn.org.

Warm regards,

Bryan P. Smolka
THE BRIDGE Editor
MU CHAPTER

Two Student Leadership Conferences Offered This Fall

Two outstanding Chapter Award winners, Mu chapter at the University of California, Berkeley and Gamma Theta chapter at the University of Missouri, Rolla, hosted student leadership conferences October 26–27, 2007, and November 2–3, 2007, respectively.

Both conferences were developed as a result of the enthusiastic feedback of participants at the conference hosted by Beta chapter at Purdue University in 2006. Each program was unique in its content but included team projects, keynote addresses from distinguished professionals, networking opportunities, and a chapter management workshop.

Mu chapter’s conference, entitled “Making a Difference: Leadership through Innovation,” included a photo hunt around campus. The photo hunt was just a fun project for their pledges, and they wanted to share it with conference attendees. It gave attendees the chance to view Berkeley’s beautiful campus while working cooperatively with their team. Attendees also went on the Advanced Light Source Tour at Lawrence Berkeley National Laboratory. To view conference details and the agenda, please visit their Web site at http://bka.berkeley.edu/conference.

Gamma Theta’s conference, “Leadership for a New Century,” focused on the engineer of the future and included a panel of professionals considering the world of 2050. Dr. Kevin Schneider, Gamma Theta member and chief technical officer of Adtran, presented the dinner keynote address. Other speakers discussed public policy, career management for recent graduates, and adapting to changing technology. Visit their conference Web site at www.umr.edu/bkcons for details about the agenda and speakers.

Both conferences were planned entirely by the chapter members who invited speakers, solicited sponsorships, and secured the facilities. No registration fee was required for either event, thanks to generous donations of IKH members as well as sponsors Adtran, Boeing, German, and Burns & McDonnell for UMR and Melissa, Informatica, and Noto Development Group for UCB. If you would like to help support future conferences, please use the envelope enclosed in this issue to send your tax-deductible donation to IKH headquarters. Conference details are available on the IKH Web site and wrap-up materials will be posted soon at http://bka.org/news/student_conferences.html.
From Ph.D. to HTTP
by Harish Agarwal

It was clear to me relatively early on that I was not as passionate about grad school as some of my colleagues. And yet, with no alternative in mind, I stayed past my entrance exams, finished classes, and worked on my research project for a few years. After I observed how happy my friend was while working on Octopart, I started helping him out at night, to fill the time. I soon went from working on it during the night to fitting my weekends with it, and making “breaks” into the workday to develop it a little more. Once I realized that I was never going to be as passionate about research as I was about my side project, my decision to leave became easy.

Just Do It
Since joining Octopart, it has become obvious to me that the only way to learn how to start a company is to go out and do it. Although the first few steps may seem mysterious, the most important part of starting a company from scratch is to start working on an initial version of your product as soon as possible. Incorporating a company and all the other details you may think about are just that—details. However, a company will be dead on arrival without a lot of time spent on developing the product; this requires blood, sweat, tears, and, yes, money. The amount of money depends on the kind of company you are starting.

Finding Funding
Octopart is an Internet company. The traditional route for funding an Internet start-up is through venture capital firms located in Silicon Valley. Venture capital firms raise large sums of money by pooling together investments from their limited partners (which range from private investors to the managers of university endowments). They then invest this money into young companies with a huge potential for growth. The investments are risky, but what venture capital firms are looking for is the rare company that will pay out many times over on their initial investment and cover the cost of the fund. Venture capitalists examine a huge number of young companies a year, on the order of hundreds, and make deals with a small fraction of them, in the order of tens.

They typically invest a few million dollars in a company to buy anywhere from 20 to 50 percent of it. This money is enough to rent an office, hire employees, and buy the hardware necessary to support your company, but it also comes with the cost of selling a part of your company to the firm—now the firm will also have a say in running your business.

The good news for Internet companies is that the old model of raising large sums of money from venture capital firms is being extricated on by smaller incubators such as Paul Graham’s Y Combinator (http://ycombinator.com).

Y Combinator provides a small round of investment (about $15,000) for a large return on good advice from seasoned Internet entrepreneurs. With the advent of open-source software and cheap computer hardware, this small round of investment is enough money for a couple of people to buy a server and pay themselves to spend a few months developing an initial version of a software product. It was with this kind of investment that octopart.com was born.

Learning By Doing
While all three of us had no experience with Web and database programming a year ago, the problem-solving background we each had as engineering majors allowed us to pick those skills up very quickly. One of the co-founders has now also dabbled into the business aspect of the company, and I believe it in this same analytical skill-set that has allowed him to perform well in that arena. Nearly a year after the initial version of the Web site launched, the three of us, along with two friends who have joined us since, are all still working on continually growing the site.
Working to Defend the Ones Who Defend Us

by Teresa Pace

The images our IGP group works with are produced by electro-optical (EO) devices, which basically means that they are systems that interact with light in some way. EO sensors include both visible and infrared (IR). Visible sensors have wavelengths from 39–75 um and can be identified as digital cameras, video cameras, or TVs. Infrared sensors have wavelengths from 7.5–12 um and are used in a wide variety of disciplines, including defense, communication, medicine, art, astronomy, and archeology. Infared infrared means “below red” because red is the color of the longest wavelength of visible light.

Imaging Sensors

There are many types of infrared sensors. Reflected infrared refers to IR light reflected off a scene. In other words, there must be some small amount of light for these sensors to work. There are two types of reflected IR sensors: near IR (NIR), which has a wavelength range of 75–500 nm, and shortwave IR (SWIR), which has wavelengths from 9–17 um. NIR sensors are used in fiber optics, image intensifiers, and night vision goggles (see Figure 1). SWIR sensors are used for long-distance telecommunications and longer-range identification (LID). Thermal IR sensors measure the amount of heat emitted from a scene and, therefore, they do not need any light to operate. Thermal IR sensors can be broken into two categories: imager IR (SWIR) and long-wave IR (LWIR). LWIR sensors operate in the 3–5 um range. Many heat-seeking missiles operate in this range. LWIR sensors operate in the 8–12 um range. Many forward-looking infrared (FLIR) systems on aircraft use this area of the spectrum. Most thermal sensors require their detectors to be shielded from heat and chilled with liquid nitrogen to form images.

However, there are uncooled sensors in the long-wave realm. These uncooled sensors do not typically perform as well as the cooled sensors, but they are much more affordable and as technology advances, so does their performance.

A thermal imaging system is typically comprised of a scene giving off infrared energy or heat, optical elements through which the energy is focused, an infrared detector that measures incoming photons, the signal processor that manipulates the image produced by the detector, and finally a video monitor for display. Image processors extract the image from the digital data stream after it is read out of the detector in order to enhance it, eliminate noise (referred to as de-noising), or retrieve information.

Night vision systems are used in defense, the police force, and navigation. The military industry uses monocular scopes, which can be handheld or mounted on a weapon, night vision goggles, and FLIR systems for ground, air, and maritime vehicles.

The police forces use night vision sensors on helicopters to search for criminals in the dark. Navigation rights issues systems are used on ships to avoid collision as well as on cars to improve visibility at night, allowing the driver to see more and farther (see Figure 2).

Image Enhancement

One specific area where our IGP group focuses its efforts is on image enhancement. Image enhancement is important for infrared imagery as well as other electro-optical imagery because EO images are typically plagued by poor contrast. While most systems have the ability to adjust brightness and contrast to improve the image, it usually does not work well over the entire image. This can be very challenging for soldiers trying to view a display, understand what they are seeing, and make appropriate tactical decisions. Therefore, using image processing to enhance the contrast across an image is extremely beneficial.

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The IGP System is better able to resolve details in an image than the original EO image. One of the strengths of the IGP System is the ability to enhance the contrast in an image, making it more suitable for night vision applications. The IGP System is better able to resolve details in an image than the original EO image.

Imaging Sensors

There are many types of imaging sensors. Two types of sensors are the visible light sensor and the infrared sensor. Visible light sensors use light to detect objects, while infrared sensors use heat to detect objects. Both types of sensors are used in different applications, such as security systems, surveillance systems, and night vision goggles.

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Conclusion

Image processing and mathematics permit every aspect of our lives, and together they can be used to better understand our world. In my case, I use them to help keep our soldiers safe and out of harm’s way. DRS has allowed me the opportunity to do this, and in the process I have found a very challenging and rewarding career.

ABOUT THE AUTHOR

Teresa Pace

Director of Engineering, DRS Optronics Technologies

Ema chapter – Board of Directors

Dr. Pace received her undergraduate degree from Wright State University and her doctoral degree from The Pennsylvania State University. She is an electrical engineer. Dr. Pace is currently responsible for image processing algorithms development for electro-optical imaging technologies. Prior to DRS Optronics Technologies, she specialized in image processing and systems engineering as a consultant at Lockheed Martin. Dr. Pace has been awarded over patents and has written journal and conference publications. In 2001, she was selected as HKN’s Outstanding Young Engineer of the Year.

For more on this topic, visit www.hkn.org/bridge

www.hkn.org
Three New Eminent Members Inducted

Eta Kappa Nu established the rank of Eminent Member in 1950 as the society’s highest membership classification. It is conferred upon those select few whose contributions and attainments in the field of electrical and computer engineering have resulted in significant benefits to humankind.

EMINENT MEMBER  Presented September 2007

Gordon Bell

Gordon Bell ranks as one of the most influential pioneers of the computer industry. During his 25 years at Digital Equipment Corporation, he was the architect of various mini- and time-sharing computers and led the development of DEC’s VAX and the VAX Computing Environment. As the head of the Computing Directorate at the National Science Foundation, he led the National Research and Education Network (NREN) panel, which created the plan for the Internet. He was also an author of the first High Performance Computer and Communications Initiative while he was at NSF. He established the ACM Gordon Bell Prize, administered by the ACM and IEEE, to encourage development in parallel processing. He continues to break new ground in information technology as the subject for the MyFirstProc project, an experiment in “liking,” an automated state of the documents, pictures, and sounds an individual has experienced in his or her lifetime.

Bell at a Glance

- Founder and director, Bell-Mason Group
- Professor of Computer Science and Electrical Engineering at Carnegie-Mellon University (1966–72)
- Assistant director, Computing Directorate, National Science Foundation (1986–1987)
- HKN Vladimir Kom Петрoff Award, IEEE Honorary Medal, National Medal of Technology; National Academy of Engineering, National Academy of Sciences; Fellow of the American Academy of Arts and Sciences; American Association for the Advancement of Science, ACM and IEEE
- Member, Beta Theta chapter
- B.S. and M.S. in electrical engineering from Massachusetts Institute of Technology

EMINENT MEMBER  Presented September 2007

Gordon E. Moore

Gordon Moore is most widely known for “Moore’s Law,” his 1965 prediction that the number of components the semiconductor industry would be able to place on a computer chip would double every year. This rule of thumb, which he revised in 1975 to a doubling of chip capacity every two years, originated as an observation on the rapid pace of technology development in an emerging industry. As a co-founder of both Fairchild Semiconductor and Intel Corporation, however, Moore was in a position to not only make these observations, but also to lead the industry in a direction that assured the veracity of his predictions. That Moore’s Law became a guiding principle for the delivery of ever more powerful chips at proportionately lower costs is a testament to both his pioneering vision and leadership.

Moore at a Glance

- Chairman emeritus, Intel Corporation
- Former executive vice president, president, chief executive officer, and chairman, Intel Corporation
- Co-founder, Fairchild Semiconductor and Intel Corporation
- Director, Gilead Sciences Inc.
- Trustee, California Institute of Technology
- Recipient, National Medal of Technology and Medallion of Freedom
- Member, National Academy of Engineering; fellow, Royal Society of Engineers
- B.S. in chemistry from University of California at Berkeley, Ph.D. in chemistry and physics from California Institute of Technology

EMINENT MEMBER  Presented June 2007

Wallace S. Read

Wallace Read was born in Corner Brook, Newfoundland, Canada, and spent his early career in the pulp and paper and hydroelectric power industries in his native province. After serving as the first full-time president of the Canadian Electricity Association (CEA), he brought a world view to the IEEE standards process that forever changed the way the organization serves its constituents. As vice president of IEEE Standards Activities from 1995 to 1999, he strengthened relations with the International Electrotechnical Commission (IEC), the International Telecommunications Union (ITU), and the International Organizations for Standardization (ISO), thereby positioning the IEEE for a greater leadership role in international standards development. Upon retirement in 1995, Read formed REMAS Inc., a provider of electric power consulting services to utilities and governments.

Read at a Glance

- President, REMAS Inc.
- President, Canadian Electricity Association (1980–1989)
- President, Institute of Electrical and Electronics Engineers (1986–1989)
- Fellow, Canadian Academy of Engineers, Engineering Institute of Canada (IEC), and IEEE
- EIC Julie C. Smith Medal and Sir John Kennedy Medal, CEA Distinguished Service Award, Canadian Standards Association John Jenkins Award, Canadian Council of Professional Engineers Gold Medal, and IEEE Charles Proteus Steinmetz Medal
- Member of the Order of Canada
- Doctor of Engineering (Honoris Causa), Technical University of Nova Scotia and Memorial University of Newfoundland
- B.E. from Nova Scotia Technical College

HKN Award Nominations

HKN invites its members to nominate outstanding individuals for these prestigious awards. Nomination details and forms can be found at www.hkn.org/awards.

Outstanding Young Electrical and Computer Engineer
- Presented annually to an exceptional young engineer who has demonstrated significant contributions early in his or her professional career
- Nominations due April 1, 2008

Vladimir Karapetoff Outstanding Technical Achievement Award
- Recognizes an individual who has distinguished himself or herself through an invention, development, or discovery in the field of electrical or computer technology
- Nominations ongoing

Distinguished Service Award
- Acknowledges an individual who has devoted time and energy to the Eta Kappa Nu Association through years of active participation
- Nominations ongoing

Outstanding ECE Student Award
- Annually identifies an ECE senior who has proven outstanding scholastic excellence; high moral character; and exemplary service to classmates, university, community, and country
- Nominations due June 30 to the LA Alumni chapter

Outstanding Chapter Award
- Singles out chapters that have shown excellence in their activities and service at the chapter level, university, and community levels
- Winners are determined by their required Annual Chapter Reports, due October 15 for the preceding academic year

C. Holmes MacDonald Outstanding Teaching Award
- Presented annually to a dedicated young professor who has proven exceptional dedication to ECE education and has found the balance between pressure for research and publications and enthusiasm and creativity in the classroom
- Nominations due June 30
Lyle’s Law of Mutuality
by Lyle D. Feisel

Line handling was no party. It was hard work and, occasionally, quite dangerous. At such times, the bearers’ mate would say, “Okay, boys. One hand for the ship. One hand for yourself.”

What did he mean? Well, it took me a while to grasp the full significance of this advice, but I finally deduced that he was telling us to take care of ourselves while also working for the team. A sailor who dedicates himself totally to the ship without any regard for his own safety won’t last long in that environment. Some accident will befall him—a parted line, a leg caught in a coil, any number of things. And then, not only is the sailor in pain or worse, the ship has lost a sailor. The ship is hurt.

This principle applies to any collection of people, be it two or ten thousand. Lyle’s Law of Mutuality summarizes it this way: A group can only succeed if its individual members succeed. And vice versa.

One Hand for the Ship

Let me comment briefly on a group of two—a marriage. One might conceive of a marriage in which one of the parties totally suppresses his or her identity and dedicates all of one’s energy to the partnership, but I wouldn’t expect to see it be a very successful or a very interesting marriage. I think the best marriage is a partnership of two individuals—each competent and self-satisfied in his or her own right, but dedicated as well to their joint mutual success.

But I and I didn’t want to go on and on about what makes professional workers such as engineers. One hand for the ship, certainly. For the professional, this means more than “a full day’s work for a fair day’s pay.” It means accepting and working toward achieving the goals of the organization.

It means exercising the duty of care, protecting the intellectual property, trade secrets, and know-how of the company. It means having a loyalty that admits honest and constructive criticism, but not mean spirited bad-mouthing.

The attitude toward education is different today, with the more progressive companies realizing that virtually any education is better than no education at all, and, if the employee will learn, the company will provide support.

One Hand for Yourself

You also need to have one hand for yourself while you are at work. A few sentences ago I said that you need to work toward achieving the goals of the company. Well, you also need goals of your own, and you need to work toward reaching them. Of course, while your goals will not be the same as those of your employer, neither should they be contrary to them. If they are, you should probably be updating your resume.

At the same time, managers have to respect and, indeed, encourage their employees to work in their own interests as well as in the interest of their employer. Not always easy, but, in my opinion, essential. In my own experience, I watched—and I hope helped—associate dean mature and become more capable until they went to greater responsibilities and rewards. I miss them when they left, but I sure they had contributed to the school than if they had not been growing as they worked.
Leading Change

by Richard Gowen

Richard Gowen began researching for unusual paths when he chose to build a maze-matering electronic mouse as his senior project in EE at Rutgers University. Since transistors were not readily available in 1956, he used vacuum tubes and relays to implement the decision logic. The machine required power from a 5 HP motor-generator. A student member of the IEEE, his mouse paper took second place in the Region Student Paper Contest because it was still three months later that the mouse could successfully run the maze to capture the electronic cheese.

Dr. Gowen began his career as a researcher for the RCA Laboratories and he recalls the interview as very different from the typical senior recruiting trip. He skipped a senior laboratory session to visit RCA expecting a tour of the activities, but instead found himself in a series of oral exams. He never got to complete his responses since as soon as it appeared he understood the question, he was asked to address a new area. He recognized that this was a company that expected the best possible knowledge in its staff and quickly accepted the offer to join RCA at the top recruiting salary. At RCA he worked with the group developing a crystal wall size TV display, a technology that reached the marketplace 30 years later.

Called to duty with the Air Force, Dr. Gowen left RCA for an assignment at a radar station forty miles from the nearest living town in northwest Montana. He finally refers to this assignment as the most intensive graduate course in human relations and technical management possible. As the only engineer, he proposed improvements in the radar system that gave him the opportunity to demonstrate an improved radar system. He was also selected to enter graduate studies in preparation to join the faculty of the then new Air Force Academy.

Researcher and Educator

In 1959, Dr. Gowen entered the Iowa State University new EE graduate program in Biomedical Engineering and graduated with the MS degree in 1961 and became the first EE PhD in biomedical engineering. Dr. Gowen's research included engineering focus studies of the human cardiovascular system which led to a patent to measure blood pressure from a finger while running on a treadmill. Shortly after joining the faculty of the Air Force Academy, Dr. Gowen received his first research contract to develop a capsule transmitter to be inserted in animals to study the medical effects of exposure to nuclear radiation. He was invited by NASA to join the space medical research team for the Gemini program in preparation for the Apollo moon flights and became the director of a joint NASA-Air Force laboratory located at the Air Force Academy. The laboratory developed specialized instrumentation to evaluate the response of astronauts to the weightlessness of space and included the capability to simulate weighlessness on human subjects (see Figure 1).

Figure 1. NASA Physiological Artificial Gravity Unit

In 1977 Dr. Gowen became the Dean of Engineering and Vice President of the South Dakota School of Mines and Technology. In 1981 he was appointed the President of South Dakota State College to become the first tenured college of the Dakota Territories a computer-based information management curriculum. The institution transformed into a university with doctoral programs and is recognized as a leading university for computer security and information management. In 1987 Dr. Gowen became the President of the South Dakota School of Mines and Technology, a position he held for 17 years, and led this engineering and science university to expand undergraduate, graduate programs, and research.

Academic Administrator

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Professional Service

Dr. Gowen has long history of involvement with the IEEE and other professional organizations. Working in volunteer activities has given him access to ideas and experiences that have helped his professional career. He served as on the board of directors of organizations for engineers, educators, community organizations and several companies. Dr. Gowen was elected the IEEE Centennial President in 1994 and led the celebration of the century of giants who created the electrical, electronic, and computer technologies that have changed the world.

In 2002 the Nobel Prize was awarded for an experiment in the former Homestake gold mine that verified the existence of neutrinos. Dr. Gowen coordinated efforts to obtain the mine for research and upon his retirement as President of the School of Mines in 2001, the Governor of South Dakota appointed him the Director of the Homestake Conversion Project to develop plans for the State to acquire the mine and implement a science and engineering underground laboratory. In 2007 the NSF selected the mine as the site for underground research.

Dr. Gowen has received many awards and recognitions, including a Honorary Doctorate for Public Service, Distinguished Alumni Award, designation as a Black Hills Diplomat, and the annual Chamber of Commerce George Award. He was designated the South Dakota Engineer of the Year and in 2006 he was similarly recognized as the National Engineer of the year by the NSPE. He continues to have involvement with professional activities and now serves as the president of the IEEE Foundation and the chair of the IEEE history committee.

Conclusion

Dr. Gowen has enjoyed challenges and in 2006 he worked to develop the Mount Rushmore Institute to advocate freedom and democracy inspired by the sculpture of the four presidents on Mount Rushmore. In 2007 he directed the preparation of a unique forum on the Middle East with panelists from throughout the world. He remains an advocate for recognizing the achievement of excellence through organizations like the IEEE and HKN. Dr. Gowen has served on the board of HKN for six years, was the president of HKN for two terms, served as the chairman of the HKN centennial celebration, and is now the chair of the HKN eminent member nominating committee. He encourages all HKN and IEEE members to recommend outstanding leaders for consideration to be elected an HKN Eminent Member.

Richard Gowen
Gamma Epsilon chapter – Rutgers University

Dr. Gowen has served in all the ranks of faculty and academic administration, was president of two universities, and is a member of the South Dakota state board of education. He was a co-chairman for the Congressional student learning study, co-chaired the SRC probabilistic risk assessment study for licensing nuclear power plants, led the conversion of a gold mine to a laboratory for neutrino research, and is leading the formation of an institute for freedom and democracy. A fellow of the IEEE, he served as the IEEE centennial president, president of HKN, and is the president of the IEEE Foundation and chair of the IEEE history committee.
Member Profiles

Ken McCue
Vice President of Electrical and Software Engineering
Chief Technology Officer
Cirrus Medical Devices

Career Highlights
I have made contributions to the semiconductor capital equipment industry and the medical device industry. Three years ago I joined with four other engineers to fund and start up a medical device research and engineering outsourcing company (Circle Medical Devices, Inc.). This has been a very successful and satisfying venture.

Education and Career
I graduated with a B.S.E.E. from San Jose State in 1979. For a while I pursued a master's in computer engineering, but eventually found my way into the work force. This was at the time of the birth of the microprocessor. Initially I designed systems using vacuum tube technology, then discrete semiconductors, and then microprocessors and VHDL. I have used almost all of my university training during my career (i.e., not cultural anthropology, but it was fun) to solve real-world problems. Statistics, dynamics, thermal transport, fluid flow, HVAC machines, and of course electronics have all been useful.

Engineer to be broad if they are going to be able to overcome obstacles. My humble opinion is that a university education in engineering should (not just enough tools in your tool bag to be able to learn the current technology and then tomorrow's next-generation technology. All of those physics and core courses in engineering are crucial in being continuously competitive.

Advice to Engineering Graduates
Don't wait to be told what to do on your first job. Learn what everybody is already doing. Ask questions. Reverse-engineer everything you can get your hands on. Be a part but not a pain, contribute, and above all, enjoy.

Steven Ruben
Chief Intellectual Property and Information Technology
WestBlack

Career Highlights
In 2000, I founded the Redwood City-based firm WestBlack. In that role, I have managed patent prosecution, Troll Ligation, an acquired specialty in the technology licensing business. The firm has handled hundreds of patent-related transactions, including patent licensing, technology acquisition, and software development.

Education and Career
I received a B.S. in electrical engineering from Stanford University in 1976. After graduation, I worked for NCR Corporation, where I was responsible for the design and development of software for mainframe computers. In 1990, I founded WestBlack, which has since become one of the leading technology licensing firms in the world.

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Stephen V. Mineau
Vice President of Digital Voice Systems Operations
Time Warner Cable

Career Highlights
The most recent highlight has been in building Time Warner Cable, previously a provider of cable TV and high-speed internet services, into the seventh-largest telephone company in the nation. I started on the project as a consultant a year before our first subscriber, and now Time Warner Cable has over 2.5 million residential telephone subscribers.

Another highlight has been in building OnePoint Communications from scratch into a major voice, video, and data provider to the BDU market. Finally, the leadership role I performed in Advanced Weapons Systems at Texas Instruments will always be a highlight in my life—mostly because it felt so good to do something good for my country.

Education and Career
I started my career in electrical engineering at Texas Instruments in the early 1970s. I worked on the development of integrated circuits and was instrumental in the development of the first commercial flash memory device. I later moved to Texas Instruments, where I was involved in the development of the first commercial flash memory device. I later moved to Texas Instruments, where I was involved in the development of the first commercial flash memory device.

Advice to Engineering Graduates
Don't wait to be told what to do on your first job. Learn what everybody is already doing. Ask questions. Reverse-engineer everything you can get your hands on. Be a part but not a pain, contribute, and above all, enjoy.

Every day, engineers like you face a world of constant change and innovation.

But when it comes to the job market and managing your career, you want it as simple as can be.

Introducing Experience: A FREE Career Service Exclusively for Members of Eta Kappa Nu

In direct response to the Second Century Project, Eta Kappa Nu and Experience have teamed up to bring you an exclusive career services center geared towards the needs of engineering students and young professionals.

- FREE access to thousands of relevant job opportunities
- FREE member-to-member job postings
- FREE content addressing interview and resume tips, professional profiles and more
- FREE career resources from Hoovers, Salary.com and more

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Full biographies of HKN's distinguished board of governors are available on-line: http://hkn.org/about/governance.html.

President
J. David Irwin, Xi
Dr. Irwin, ECE chair at Auburn University, has been active at Auburn for most of his career. He is a fellow of the IEEE and ASEE and has served on multiple honors and educational committees with the IEEE. He has authored and co-authored numerous publications, patent applications, and presentations, including 16 textbooks.

Vice President
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Dr. Eisenstein, ECE professor at Drexel University, is a C. Dickinson McDowell Outstanding Teaching Award recipient and an IEEE Fellow. He has published more than 50 papers and has lectured extensively worldwide.

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Karl Mattern, Eta-Beta Beta Beta
Mr. Mattern's professional career includes leading remote planning and systems analysis activities for the Apollo lunar landing and Skylab projects and assuming responsibility for the design and development of the ARISS radio modem. He retired as president and CEO of AeroComm and currently consults.

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David Soldan, Beta Kappa
Dr. Soldan, ECE professor at Kansas State University, served as ECE department head at ISU for 15 years. He is active on the IEEE committee on Engineering Accreditation Activities. Dr. Soldan was active in the Electrical and Computer Engineering Department Heads Association (ECECHAs), serving as president from 2002-2005.

Director of Large
Stephen Goodnick, Pi
Dr. Goodnick is associate vice president for research at Arizona State University. Prior to this position, he was an IEEE department head and an active officer in ECECHAs. He has been a visiting faculty member at universities worldwide and has published more than 150 refereed journal articles, books, and book chapters.

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Evelyn Hirt, Beta Sigma
Ms. Hirt, an ESHO principal engineer at Pacific Northwest National Laboratory, has held a variety of positions in EIE, including project management, systems design, analysis, and testing. Flight control systems, laboratory operations, and product testing. She is active in the IEEE and academia.

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Teresa Pace, Eta-Beta Beta Beta
Dr. Pace is director of engineering at ISS/Optoelectronics Technologies. Previously she worked for Lockheed Martin and the Applied Research Laboratory, focusing on the application of engineering to the field of medicine. Dr. Pace has received four patents and received many awards, including HKN's Outstanding Young Electrical and Computer Engineer.

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Casimir Skrypczak, Delta Mu
Mr. Skrypczak was senior vice president of Customer Advocacy at Cisco Systems, and prior to that he was corporate vice president and group president of Professional Services at Telstra Technologies and president of NIXELS Science and Technology. He currently serves on multiple boards and consults.

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John Orl. Alpha
Dr. Orl. is a principal engineer at Northrop Grumman Innovative Systems, where he designs and develops software and hardware systems for a variety of applications. He has published numerous papers and has received numerous awards for his contributions to the field of electrical engineering.
Chapter Notes from Headquarters

We hope that your year has started off successfully. We are proud of the activities and accomplishments of the nearly 175 active Eta Kappa Nu chapters across the United States.

Many of you have engaged undergraduates through mentoring and tutoring and encouraged high school students to pursue a degree in ECE by guiding tours of your department and campus. Some chapters have formed Relay for Life teams supporting the American Cancer Society, and many have held fundraisers for a variety of charities. At the department level, you have performed service to your classmates by hosting lecture series, organizing job fairs, and monitoring the laboratories. And don’t forget the social activities! We love seeing the pictures of the IEEE/Tau Beta Pi/EKN chapter football games, dance lessons, picnics, and pizza parties. It is a special honor to be an Eta Kappa Nu member, and we are proud of your accomplishments!

Headquarters has a few notes to share with the chapters:

• Starting in November 2008 the IRS rules are changing. Any chapter with gross receipts of $25,000 or more must continue to file Form 990. Next year, chapters with less than $25,000 in gross receipts must file an e-postcard with the IRS annually. This is a short on-line form stating the chapter’s contact information and confirming that the gross receipts remain under $25,000. More information will be posted at www.irs.gov, and chapters will continue to be reminded of this new requirement. EKN could lose its tax-exempt status if chapters fail to fulfill this obligation. Chapters should contact HQ if they need their tax-ID number.

• Requirement for membership: All inductions must participate in the induction ritual in order to become members of EKN. Similarly, they are not considered members until HQ receives a completed New Member Requisition Form and processes the membership. It is important to mail the paperwork in a timely fashion so that new members receive THE BRIDGE; can register on Experience Inc., the new career database for EKN members; and enjoy the benefits of membership. If you have not received certificates for new members, you can assume HQ has not received the paperwork for new members.

• Recruiting is often a struggle for chapters. Here are some recruiting ideas:
  > Send personalized letters to invitees from your department head, distinguished faculty or alumni, or advisory board member
  > E-mail HQ a list of invitees so that Roger Plummer, executive director, can send personal e-mails encouraging invitees to join
  > Tailor the recruiting PowerPoint presentation available on-line to meet your chapter’s needs and use it at your information sessions
  > Inform potential members of Experience Inc., the new career database offered to EKN members. It is a great benefit of membership and offers lots of articles, internships, job shadowings, interviews and resume techniques, connections to other EKN members, and job postings.

As always, please do not hesitate to contact headquarters if you ever have any questions!
2006–2007 Annual Fund Contributors

Eta Kappa Nu acknowledges and thanks its generous donors for the 2006-2007 annual contribution campaign. Through their support, attendance at the student leadership conference at Purdue University in November 2006 was offered to all Eta Kappa members at no cost. The Purdue conference was very successful and received such enthusiastic feedback that two chapters, Gamma Theta (University of Missouri, Rolla) and Mu (University of California, Berkeley), will host regional conferences in fall 2007 once again at no cost to attendees.

The Eta Kappa Nu Web site (www.ekn.org) continues to evolve as it becomes the first place Eta Kappa members visit for chapter, member, and organizational news. The Awards Program is thriving. Since July 2006 15 Outstanding Chapters, an Outstanding Student, Three Eminent Members, a Distinguished Service Award winner, and a Krameroff Award winner have been recognized. Partnerships with the IEEE and ECEDEE, the Electrical and Computer Engineering Department Heads Association have been strengthened. A database of current offices will be offered to all Eta Kappa members starting fall 2007. It is in direct response to the Second Century Project feedback and will help keep alumni engaged.

Our heartfelt gratitude goes out to all Eta Kappa supporters as we continue to recognize the top students, faculty, and professionals in electrical and computer engineering.

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Everything needed to establish and run an HKN chapter is available in one spot on the HKN Web site.

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