2019 Issue 1 // Volume 115

THE BRIDGE

The Magazine of IEEE-Eta Kappa Nu

I Make AN Impact

80,504 COMMUNITY SERVICE HOURS

88,435 PEOPLE IMPACTED

INTERACTED WITH 577 COMPANIES

9 NEW CHAPTERS CHARTERED

(BASED ON STATS FROM 2018)

IEEE

IEEE-HKN AWARD PROGRAM

As the Honor Society of IEEE, IEEE-Eta Kappa Nu provides opportunities to promote and encourage outstanding students, educators and members.

Visit our new website to view the awards programs, awards committees, list of past winners, nomination criteria and deadlines.

ALTON B. ZERBY AND CARL T. KOERNER OUTSTANDING STUDENT AWARD (OSA)

Presented annually to a senior who has proven outstanding scholastic excellence and high moral character, and has demonstrated exemplary service to classmates, university, community, and country.
(Deadline: 30 June)

C. HOLMES MACDONALD OUTSTANDING TEACHING AWARD (OTA)

Presented annually to electrical engineering professors who have demonstrated, early in their careers, special dedication and creativity in their teaching, as well as a balance between pressure for research and publications.
(Deadline: Monday after 30 April)

DISTINGUISHED SERVICE AWARD

Recognizes members who have devoted years of service and lifetime contributions to Eta Kappa Nu (or IEEE-HKN), resulting in significant benefits to all of the Society's members.
(Deadline: Monday after 30 April)

OUTSTANDING CHAPTER AWARD (OCA)

Recognizes chapters for excellence in activities and service at the department, university and community levels. The award is based on the content contained in their Annual Chapter Report for the preceding academic year.
(Deadline: Monday after 30 September)

OUTSTANDING YOUNG PROFESSIONAL AWARD (OYP)

Presented annually to an exceptional young engineer who has demonstrated significant contributions early in their professional career.
(Deadline: Monday after 30 April)

IEEE-Eta Kappa Nu Board of Governors

IEEE-Eta Kappa Nu (IEEE-HKN) was founded by Maurice L. Carr at the University of Illinois at Urbana- Champaign on 28 October 1904, to encourage excellence in education for the benefit of the public. IEEE-HKN fosters excellence by recognizing those students and professionals who have conferred honor upon engineering education through distinguished scholarship, activities, leadership, and exemplary character as students in electrical or computer engineering, or by their professional attainments. THE BRIDGE is the official publication of IEEE-HKN. Ideas and opinions expressed in THE BRIDGE are those of the individuals and do not necessarily represent the views of IEEE-HKN, the Board of Governors, or the magazine staff.

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THE BRIDGE

The Magazine of IEEE-Eta Kappa Nu

ISSUE 1, 2019 | MAKING AN IMPACT: IEEE-HKN ANNUAL REPORT

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HKN SERVICE AFTER GRADUATION:

Can STEAM Education Help Lift Developing Nations?

Kayla Ninh, Gamma Theta Chapter

Is promoting STEAM (Science, Technology, Engineering, Arts, Mathematics) education enough to lift a country out of poverty? How do you promote STEAM education in rural schools with a lack of laboratory supplies, no electricity, and pervasive gender stereotyping?

STEAM education can have a significant impact on moving people out of poverty and promoting gender equality if used with a proper cultural, gendered, and economic lens. U.S. Peace Corps, in partnership with the Lesotho Ministry of Education, hosted its first ever STEAM Camp for 66 students from 11 high schools in the Mountain Kingdom of Lesotho, a landlocked country located in southern Africa.

STEAM Camps aim to expand the number of youth who pursue advanced degrees and careers in STEAM fields, promote STEAM literacy with hands-on training to educators, and broaden participation of women and minorities in that workforce. The main goals are to combat the lack of teaching resources, address the culture of difficulty around these subjects, mitigate a general lack of knowledge regarding STEAM careers, and provide STEAM education in relative proximity to the students' homes, thus, reducing the "brain drain" effect. Valuable human resources can stay in country and stimulate economic growth there, rather than migrate to a country with greater resources.

Photo Credit: Kayla Ninh

GATHERING STEAM FOR ECONOMIC GROWTH: A STORY OF SERVICE

People in the Mountain Kingdom of Lesotho are working hard to educate the next generation of their workforce in STEAM (Science, Technology, Engineering, Arts, Mathematics) area disciplines, but not without many hurdles. With students walking hours to school, a lack of teaching resources, and sometimes less-than-ideal weather conditions, Basotho (people who live in Lesotho) students are still expected to compete neck and neck with others who have more resources. Despite these obstacles, the flame of determination to succeed burns bright in Lesotho. As we gathered input from teachers from around the country, the concerns came pouring in. What if new curricula do not translate well into their mother tongues? How can we motivate uninterested students? What if we do not have the needed equipment to explain this topic? A physics teacher in one of the southern districts explained: *"The problem is the children aren't interested in these classes. They can't see what is happening because we don't have the supplies, and there's a culture of difficulty around these subjects. We need to change attitudes."*

Leading a team of seven U.S. Peace Corps volunteers in Lesotho, I helped craft a teacher training and camp program for the country. Curricula and resources were designed and tailored to the local conditions. The schools were brought into the process to build support for our activity with its STEAM theme.

It began with a two-day workshop for 12 advisors from all schools in attendance, with the goal of discussing how to overcome the challenges of teaching STEAM with limited resources, language barriers, and lack of interest. Teachers also were trained on topics such as the growth mindset, and a STEAM Guide Book was created, detailing different activities that can be completed in rural environments with little to no resources.

Campers along with STEAM Team faculty advisors & Peace Corps Volunteers at the end of the Closing Ceremony at the camp.
Photo Credit: Shelby Perkins, Peace Corps Lesotho RPCV (Returned Peace Corps Volunteer) 2016-18

The camp spanned five days, with each morning focusing on the importance of a letter in STEAM, such as building the tallest free-standing tower using only straws and tape for 'E' Day. Afternoons were spent filled with a weeklong group project, "Build A Bridge!" It emphasized how these topics intersect, ranging from budget-making to prototypes.

Photo Credit: Kayla Ninh

Multiple professional organizations also took part. Girl's Coding Academy introduced Scratch programming. The Morija Art Centre taught felt making from local resources. Bethal Business and Community Development Centre explained solar energy systems. The list was endless!

Some students touched computers for the first time; some students had no idea what engineering was, and some students even learned how to code without any technology at all. In a truly inspiring moment, within 15 minutes, students, who had no previous exposure to computers, were working at pace with students who accessed them weekly.

The results were astounding! Students were exploring concepts previously unheard of: **Every one of the 66 students improved in at least one area of STEAM knowledge, and 10 out of 10 teachers reported feeling more confident in teaching**

> My experience of service with HKN and STEAM disciplines at Missouri S&T wove into my drive to *turn words of problems into actions of solutions.*
>
> ”

STEAM-related subjects. The camp has been documented and designed to be continued in future years, making it possible to apply the camp in other developing countries.

The STEAM Camp gave teachers, students, and organizations who have a passion for these discipline the opportunity to gather for a week and ignite a

Campers on day 1 of STEAM focusing on the 'S' for science through a density experiment using local materials of honey, dish soap and paraffin. | *Photo Credit: Kayla Ninh*

> On our way to the impossible, ***we might just find something eminently doable.***
>
> NASA

flame that will hopefully last for years to come. This effort could not have been possible without my experience with HKN, the U.S. Peace Corps program, and the extremely inspiring and powerful STEAM-minded teachers and other Peace Corps Lesotho volunteers.

For more information on U.S. Peace Corps activities in Lesotho visit: www.peacecorps.gov/lesotho/

A PERSONAL PERSPECTIVE

Eta Kappa Nu is founded upon a commitment to service, a value that I tried to instill into others during my time with the Gamma Theta Chapter at Missouri S&T and a value that I still remind myself of every day. In the tech world, it's easy to forget the struggles of others, whether they are of another gender or another culture entirely. My experience of service with HKN and STEAM disciplines at Missouri S&T wove into my drive to turn words of problems into actions of solutions.

I believe our story should inspire younger STEAM professionals, like myself, who may come from a small college town, are a first-generation college student or first-generation American, to use our privileged college experience to find a way to help in the world. Keeping cultural diversity in mind, with the right tools we can find ways to weave cultures from all around the world into the spirit of discovery through STEAM education.

STEAM education alone cannot lift a developing nation, but with the hands of generations of teachers, students, and other helping nations, the margin of disparity can begin to shrink. An HKN member should live out the value of volunteerism and service while a student and continue such activity as a professional. Whether the service is across the globe in a developing nation or in your local community, you have the ability to make an impact.

Kayla Ninh is an alumna of Missouri University of Science & Technology. She received her BS in Electrical Engineering in 2016 and entered the U.S. Peace Corps, where she served for two years as a Secondary Math Educator in Lesotho (Africa). She is an IEEE-HKN Member and former Chapter President of the Gamma Theta Chapter. She currently is taking advantage of free time after the Peace Corps to visit new countries and looks forward to entering the developmental engineering workforce in Summer 2019 with her gained experience.

Author's note: The views expressed in the article are the author's own and do not represent the views or opinions of the US Peace Corps Organization.

PARTNERS IN SCHOLARSHIP, CHARACTER AND ATTITUDE:

IEEE-HKN Mu Eta Chapter and IEEE Student Branch at University of KwaZulu-Natal Work Together to Grow Membership and Increase Their Impact on the Community

Dauda Ayanda, Mu Eta Chapter

The three tenets of IEEE-HKN – scholarship, character and attitude – have taken hold at the University of KwaZulu-Natal in South Africa as the IEEE-HKN Mu Eta chapter and the university's IEEE Student Branch have joined forces to grow student involvement, foster academic excellence and have greater impact on their community. This partnership has been so successful that the combined membership of the Mu Eta chapter and the Student Branch is now the third largest IEEE student entity in IEEE South Africa.

IEEE-HKN member Shaun Barnett is flanked by Matthew Brown (left) and Dauda Ayanda (right) | *Photo Courtesy of Mu Eta*

Over the last two years, the University of KwaZulu-Natal (UKZN) HKN Nu Mu Eta Chapter and UKZN IEEE Student Branch (SB) grew from a few members to nearly 30 active members.

The recently established HKN Chapter and many-years-old Student Branch have worked together closely to take advantage of academic excellence and leadership development opportunities promoted by IEEE-HKN and Student Branch, respectively, and to increase the IEEE activities and attractiveness at UKZN.

Mu Eta Chapter Induction 2017/18 | *Photo Courtesy of Mu Eta*

Led by HKN member Shaun Barnett, plans were set in motion to rekindle the Student Branch. Working closely with the already established Mu Eta chapter of IEEE HKN, the Student Branch strived to bring the knowledge and benefits of IEEE membership to the greater student body. The branch endeavors to enrich and inspire students to the benefit of their communities through collaboration with organizations of relevant events and opportunities.

Further, it was only through close collaboration among the Mu Eta Chapter Executive Committee for 2018 (President Sulaiman Patel, Vice President Dauda Ayanda, Treasurer David Parker, Corresponding Secretary Mary Ahuna and Recording Secretary Naymah Adnan) that traction could be gained in the direction of re-activating the UKZN IEEE activities.

Preparing Students for the Job Market

One of their successful joint endeavors was a "Skills Development Workshop," aimed at preparing students for the job market. Dr. Han van Loon, a knowledge management expert from Switzerland and a representative of several international standards-setting bodies, was the guest speaker and tutor at the workshop. Mock interviews were conducted in order to coach the attendees. They also were guided on how to write an outstanding curriculum vitae and took part in discussions on successfully passing an interview and the differences between academic and working environments.

Skills Development Workshop Attendees | *Photo Courtesy of Mu Eta*

Motivating the Next Generation of Engineers

For IEEE Day celebrations in October, Dr. Upasana Singh organized "Women in Technology and Engineering Careers" talks for more than 200 local high school female students. IEEE Student Branch and Mu Eta Chapter members, Dauda Ayanda and Naymah Adnan spoke at the event, aimed at inspiring young women to enter these fields.

IEEE Day Women in Technology and Engineering Attendees
Photo Courtesy of Mu Eta

Rising Together

An important element in the recipe for successful growth and impact was to ensure a close and mutually advantageous relationship with the university Discipline of Electrical, Electronic and Computer Engineering. The involving support from the Discipline helped with visibility and scale of the events for IEEE. The increase in the number of activities and events due to IEEE activities has helped the Discipline to increase its rating inside the university and receive greater internal funding.

The Chapter and Student Branch's efforts to host joint events and activities have proven that the goal to enrich and inspire student and contribute to community development is achievable through collaboration.

Dauda Ayanda is the Incoming President of the IEEE-HKN Mu Eta Chapter at the University of KwaZulu-Natal in South Africa. He served as Vice Chair of the IEEE South Africa Section from 2017 to 2018.

Dauda Ayanda is an Alumna of Obafemi Awolowo University, Nigeria where he received both his BSc in Computer Engineering and MSc in Computer Science in 2006 and 2012 respectively. He is currently pursuing his PhD in Electronic Engineering in University of KwaZulu-Natal, South Africa and will graduate in 2019. He is now the incoming Chapter President of Mu Eta. He is an IEEE-HKN Member, an Elsevier Certified Specialist on Thomson Reuters, former Mu Eta Chapter Vice President and former Vice Chair of IEEE South African Section. He also is currently on leave of absence from University of Ibadan where he served as the Senior Network Administrator for the university library.

SAVE THE DATE

Student Leadership CONFERENCE 2019

November 1-3 | Tufts University | Boston, MA

The annual IEEE-HKN Student Leadership Conference is a signature program of the society and is an opportunity for your chapter 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.

Learn more at **hkn.ieee.org/get-involved/student-leadership-conference/**

IEEE-HKN Pathways to Industry Workshop | Sunday, March 24th 2019 | 8am – 5pm

Designed for students preparing for the transition from Undergraduate or Graduate School to industry, "The Pathways to Industry" workshop, being held in partnership with ECEDHA, will bring together students and professionals to discuss personal career paths, share hard-earned insights, and offer practical advice for young professionals.

Registration is limited to 40 student attendees. It is offered for **$195.** IEEE-HKN students can attend free of charge: Use the code GRANT at check out. The workshop includes breakfast, lunch and evening reception.

This workshop offers a unique value proposition providing valuable insight to students.

HIGHLIGHTS INCLUDE:

- "Spotlight on Industry" interactive presentations
- Making the Transition from Student to Professional
- Skills They Don't Teach You in School: negotiation, ideation, people management, judgement and decision making, professional communication, networking
- Engagement with Industry and Networking with EE/ECE Department Chairs

Learn more **https://conference.ecedha.org/Conferences/2019-ECEDHA-Annual-Conference-and-ECExpo/Schedule**

Photo Courtesy of Missouri S&T Marketing and Communications Office

Life-Saving Gamma Theta Member Receives Award

Kevin McPherson, Gamma Theta Chapter

Written by Sarah Potter

Police Chief Doug Roberts of Missouri University of Science and Technology and Ron Smith, chief of Rolla Fire and Rescue, surprised a Missouri S&T student with an award for his life-saving efforts while working as a lifeguard on campus.

The student, Kevin McPherson, received the recognition during a Nov. 27 Missouri S&T Student Council meeting at the Havener Center on campus. He was unaware that he would receive the recognition, believing he had been invited to the meeting to provide an update on the swim team.

On Oct. 30, 2018, McPherson pulled a student from the pool at the Gale Bullman Building and performed CPR until she regained consciousness. McPherson is a senior in electrical engineering from Oakdale, Minnesota, an IEEE-HKN Gamma Theta member and a member of the S&T swimming team.

Roberts says McPherson saved the woman's life, and he wanted to recognize McPherson's good deed.

We are proud of Kevin for responding quickly and resuscitating the drowning victim, *Roberts says.* ***I know her husband and her family are grateful, too, that he was there and able to help.***

Following Roberts' presentation, Smith presented McPherson with a Rolla Fire and Rescue "challenge coin" in recognition of the rescue.

In addition to being a member of the swimming team, McPherson helps coach local swim students through the Rolla Fins Swim Club. In the 2017-18 school year, McPherson earned All-American honors as part of the Miners' 400- and 800-yard freestyle relay teams, both of which finished among the top eight at the NCAA II Championships.

Kevin McPherson, from Oakdale, Minnesota, is a senior in Electrical Engineering at Missouri S&T. He was inducted into IEEE-HKN Gamma Theta in the spring of 2018 and is the recipient of the Founder's Chapter Award for exceptional contributions by a member in the fall of 2018.

Sarah Potter is the Director of Strategic Communications in the Marketing and Communications Office at Missouri University of Science and Technology. She can be reached at sarah.potter@mst.edu

José M. F. Moura

2019 IEEE President and CEO

José M. F. Moura is the Philip L. and Marsha Dowd University Professor at Carnegie Mellon University, a member of the U.S. National Academy of Engineers, corresponding member of the Portugal Academy of Sciences, and Fellow of the U.S. National Academy of Inventors, IEEE, and American Association for the Advancement of Science (AAAS). He received the IEEE Signal Processing Society Award and the IEEE Signal Processing Society Technical Achievement Award. He holds a doctorate from MIT and an EE from Instituto Superior Técnico (IST), Lisboa, Portugal.

José holds 15 patents, including two (co-inventor Alek Kavcic) used in over 4 billion disk drive chips in 60 percent of all computers sold in the last 15 years and the subject of a 2016 US $750 million settlement between Carnegie Mellon and a semiconductor manufacturer. He co-founded Spiralgen, whose super-fast software codes were licensed by Intel and used by other companies.

José has two main priorities: to strive for a transparent, lean, open IEEE running balanced operational budgets and focusing its capital investments on creating IEEE's future through new sustainable businesses that serve members and IEEE's technical communities; and to significantly increase IEEE's membership by making it relevant to professionals from all walks of life, gender, young and seasoned, from any industry or country in the world.

José has served on the IEEE Board of Directors as Technical Activities Vice-President and Division IX Director. He was a member of the IEEE Awards Board, Educational Activities Board, Publication Services and Products Board. He is a founding member of the IEEE Portugal Section. He was inducted into the Eta chapter of IEEE-HKN in 2016.

José Moura and 2016 IEEE-HKN President S.K. Ramesh

How has Eta Kappa Nu (IEEE-HKN) impacted your life? Your career?

I am honored to have been inducted into IEEE-HKN in 2016.

What inspired you to choose the engineering field?

Certainly my father, who by the way did not have the opportunity to go to college. I always wanted to be an engineer, even before I knew what engineering meant or was.

What do you love about engineering?

Problem solving by asking the right questions and finding the simplest solution that works.

Professional Profile

Whom do you admire and why?

Some of the living giants in my fields of research (Bucy, Kailath, Mitter…), my wife, a giant in her own field of AI, and of course my very successful children and students.

In your opinion, what has been the greatest change in engineering since you were a student?

The ability to solve large scale complex problems that require interdisciplinary teams, technologists and domain experts working together. Look at an iconic example, the iPhone that preconfigures the fourth industrial revolution, the one we are living right now. Then it is the confluence of many different technologies and advances ranging from materials, design and human-computer interface, wireless communications, chip design, image and signal processing, and many others.

I wish I had known…

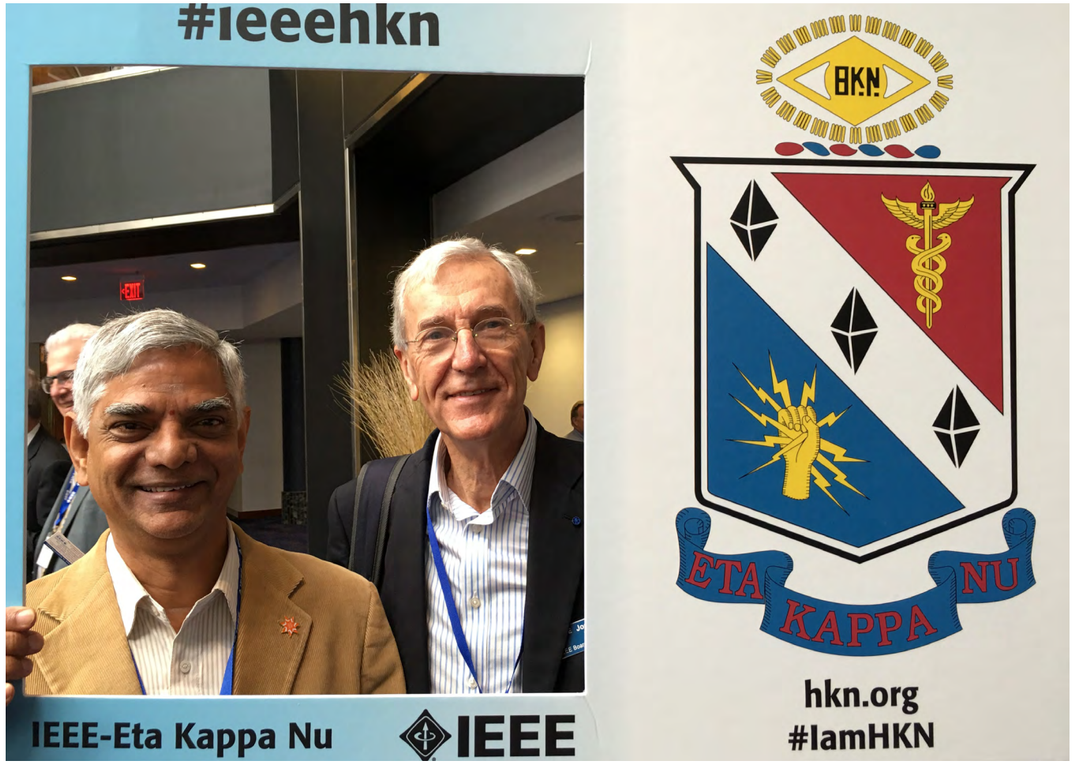
Einstein? Or Edison, Bell, Curie, Westinghouse? Or Lincoln, Fernão de Magalhães? So many others.

Best advice for new graduates…

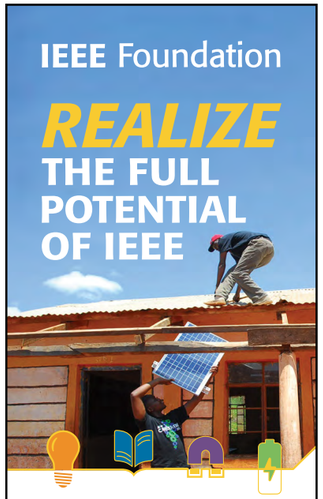
Find good problems to work on and don't give up. Get involved. Be happy.

From your perspective, what's the next BIG advance in engineering?

Beyond an outstanding advance in a narrow field, I will refer to the National Academy of Engineers XXI Century 14 grand challenges ranging from reverse-engineering the brain to sustainability, personalized learning, better medicines, health, clean water, or secure cyberspace, among others. The last one has an interesting ring to it – engineer the tools of scientific discovery. Conquering any of these would make a tremendous impact in our lives.



José Moura with Ramakrishna Kappagantu, Region 10 Director



The IEEE Foundation Kicks Off An Historic Initiative

IEEE Eta Kappa Nu enjoys a close working relationship with the IEEE Foundation. Currently IEEE-HKN exists as a Legacy Program of the IEEE Foundation. For 45 years, the IEEE Foundation has served as the philanthropic partner of IEEE. Recently the Foundation has evolved, assuming a more proactive profile and adopting a more targeted approach to Advancing Technology for Humanity. One of the hallmarks of that new approach is the first-ever major fundraising Campaign undertaken by IEEE. Its objectives are outlined as follows.

Many of the world's most pressing challenges require innovations in engineering. IEEE-HKN members are among those helping to provide solutions to some of these critical issues:

MORE THAN 1/2
of the world's population cannot access the Internet

MORE THAN 1/3
of the world's population does not have access to adequate sanitation

MORE THAN 1 BILLION
people have no access to reliable electrical power

These challenges are daunting and solvable, with IEEE committed to playing a full role. IEEE has identified a number of strategically important initiatives that will help meet the pressing global challenges cited above.

The IEEE Foundation is leading a special Campaign to Realize the Full Potential of IEEE across IEEE's expansive network to raise awareness, forge partnerships and generate the required financial resources, with a current **$30 million goal.** This ambitious Campaign was launched in February of 2018. To date, in excess of **57 percent of the goal has been achieved.** The objective is to meet and/or exceed the goal by IEEE Day 2020.

You can be a part of the success AND benefit HKN directly.
Simply follow this link and designate your contribution to one of the IEEE-HKN programs listed in the drop down menu.

Watch this space in subsequent issues of The Bridge as we detail some of the specific programming designed to positively impact IEEE, Eta Kappa Nu and society at large.
It is only through your support that we are able to meet these challenges.

Dr. Asad Madni is pictured at right with his wife, Gowhartaj, and son, Jamal.

Asad Madni, Ph.D.

Iota Gamma Chapter
IEEE Life Fellow

Dr. Madni was elevated to IEEE-HKN Eminent Member in 2015 and received the IEEE-HKN Vladamir Karapateoff Outstanding Technical Award in 2017 "for seminal contributions to the development and commercialization of intelligent sensors, systems and instrumentation for aerospace, commercial aviation and automotive safety."

His achievements include leading the development and commercialization of intelligent sensors, systems and instrumentation for the aerospace, military and commercial and transportation industries. Major contributions with worldwide impact include the Extremely Slow Motion Servo Control System for the Hubble Space Telescope's Star Selector System, which provided the Hubble with unprecedented accuracy and stability, resulting in truly remarkable images that have enhanced our understanding of the universe; and the revolutionary MEMS GyroChip® technology, used worldwide for electronic stability control and rollover protection in passenger vehicles, thereby saving millions of lives every year.

"As I reflect upon my 40+ years in engineering, I cannot help but realize the important role that IEEE played in helping me achieve my career objectives -- from keeping me abreast of the technical advancements taking place in my field through its publications and conferences, providing me opportunities to interact with some of the best minds in the world and providing a tremendous sense of satisfaction in mentoring the next generation of engineers to recognizing me with its most prestigious awards," shared Asad Madni.

Involved with IEEE since 1976, Asad appreciates the unique place IEEE holds in the engineering and electronics arena. "IEEE's most significant contribution may be best stated by the tagline 'Advancing Technology for Humanity,' which not only includes achieving breakthroughs in technology but also training a whole new generation of engineers to address the challenges of the 21st century," he said.

> *I urge all of my fellow colleagues to generously support IEEE-HKN* in helping to develop the next generation of engineering leaders.
>
> ASAD MADNI

"IEEE, together with other leading societies, will play an important role in training engineers with the necessary skills to address the engineering challenges confronting society," he said. "I urge all of my fellow IEEE colleagues to generously support IEEE-HKN in helping to develop the next generation of engineering leaders."

Regarding his decision to donate to both the IEEE-HKN Student Leadership Fund and the IEEE-HKN Operating Fund, "I believe that the IEEE-HKN has a major role to play in educating the next generation of engineers and in providing them with the necessary leadership training," Asad said. "I hope to continue supporting IEEE-HKN in this most important mission."

Geeling Alina Chau

Kappa Psi Chapter

Geeling (pronounced Jee-ling) is a third-year undergraduate student at the University of California, San Diego (UCSD). She is working toward a bachelor's degree in Computer Engineering and Cognitive Behavioral Neuroscience in hopes of developing better brain computer interfaces to augment human cognitive capabilities. Geeling was raised in the San Francisco Bay Area, where she attended Stanford's Online High School and competed in FIRST Robotics. At home, Geeling enjoys building hardware and software tools for her family's store. Geeling was inducted into UCSD's IEEE-HKN Chapter, Kappa Psi, during her freshman year of college. She served a year as ECE Tech Chair and is now Vice President of External Affairs, helping run a board of 20 officers. In addition to HKN and academics, Geeling enjoys going to Hackathons, staying fit and going on adventures with friends and family.

During a Monterey Bay Adventure on 1 January, Geeling climbed down the rocks (left photo) to meet these little critters (right photo). *Photo Courtesy of Kappa Psi and Geeling Chau*

What has it meant to you to be inducted IEEE-HKN?

To me, being in HKN means valuing academics, growth, and inclusiveness. Being able to say that I'm part of an honor society is a nice plus for resumes and garnering congratulations, but what I value the most is the community of people who shares similar values. I felt really lucky to have found HKN through our school's ECE tutoring center, a group of people who are not only passionate about succeeding academically, but also enjoy helping others develop. During the induction process, I learned that HKN really stands by these values by putting on professional, academic, and technical workshops for the broader engineering community. These are areas that all students can benefit from, no matter race, gender, or any other identity divisions. We're all engineers, passionate about our field. This focus of striving to be successful and supporting each other in a safe and inclusive environment is what means the most to me about being inducted IEEE-HKN.

Do you have a best HKN story to share?

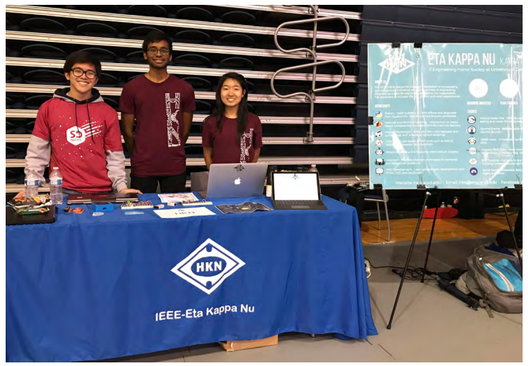
One of my favorite HKN experiences was hosting the Wireless Power Workshop for our engineering community. After testing the workshop demo, I had to gather help from other officers to wind the transmitter and receiver coils for 30 sets of the materials. Each coil is 20 rounds of thin magnet wire, and each set had 2 coils that had to be spun. We had a lot of fun finding innovative ways to make the process faster, such as using an electric drill and water bottle to make the winding faster. On the day of the event, we were thrilled to share the workshop with nearly 30 attendees! After a couple hours of building, disassembling, and debugging circuits, many students were able to walk away with working wireless power transmitters and show their friends how such a simple circuit can light an LED without being connected to any power source!
I love how neat and interesting this workshop was, representative of the technical development we aim to provide for our community.

Induction photo: Winter 2018 Cycle | *Photo Courtesy of Kappa Psi and Geeling Chau*

Why did you choose to study the engineering field?

I've always loved fiddling with things around me, making random gadgets to reduce work. At home, I installed a plastic pipe, which draws recyclable water from our kitchen sink directly to our garden so we don't need to bring buckets of water outside anymore. When I was little, I would build trains out of strawberry cartons to carry all my stuffed animals. The little gadgets my stuffed friends had were things collected from around the house. At the family store, you'll find random pens and packaging knives stuck together or makeshift grabbers made from cardboard -- very useful for the 5-foot-tall me.

I discovered computer science, electronics and hardware while taking Stanford's Press Play:



Tabling at SD Hacks | *Photo Courtesy of Kappa Psi and Geeling Chau*

Interactive Device Design course in high school, which taught prototyping and designing for needs. Over that summer, I enjoyed how much I was learning, the hands-on nature of the labs, and the application of building for needs for the final project. The process of applying my new-found knowledge and seeing the fruits of my summer develop into something that could better our lives felt powerful and heroic.

What do you love about engineering?

Engineering is a fascinating field because it's where the impossible becomes possible. Crazy ideas are made into reality. It's the next level, after we learn a few things about the world.

I love how learning is greatly encouraged and how everyone is open-minded about crazy ideas. Engineering incorporates many different disciplines, techniques and sciences in order to make something a reality. This opens up learning in nearly any field you could possibly be interested in and gives that curious learning a purpose. Being open-minded in a brainstorming session is incredibly important, and I love it when our imaginations run wild. Engineering is what has built our world to be as amazing as it is: skyscrapers, cars, planes that can bring you across the planet. Engineering gives us power, more to do, more experiences to have. Engineering opens up endless possibilities.

What is your dream job?

My dream job is to help build a non-invasive brain interface that will be able to augment our human cognitive capabilities with the advancing powers of artificial computation. What I mean here is using computers and technology to interface directly with our brains to provide extra computation, memory, and intelligence to each individual person. I want to see computers read your intent, carry out the necessary commands to pull up the requested knowledge or type out messages to send. I know this sounds impossible, but hey dream job, right? This project excites me because it is an interdisciplinary dance between two of the fastest progressing fields: engineering and neuroscience. Luckily I have the opportunity to explore both during my time in college. I am looking to hone my engineering and data science skills as well as my understanding of the brain's functions and technology that is used to sense data from the brain.

At HackMIT! | *Photo Courtesy of Kappa Psi and Geeling Chau*

What is the next BIG advance in engineering?

I think the next exciting breakthrough in engineering will be BCI technology: to have our brains connect directly with computers. Computers have made immense improvements in the past 80 years, going from a room-sized computing devices, to chips smaller than your eye can see. Computers are faster, smarter and smaller, yet, for the past 50 years, our human ability to interface with computers has largely been through mice and keyboards. The speed of computing power has surpassed the speed at which we can provide computers with new commands, calling for a more direct and efficient way to integrate computer usage with ourselves. Our brains are the source of our intents and actions, so what is better than to have our brains directly connect with a computer interface? This will allow anyone with a working mind to operate a computer. With the advances in neuroscience and biology, BCI technology is gaining traction. People are already able to type by just looking at letters, control avatars by looking at flashing arrows, and control virtual hands by using nerve signals from the wrist. Such advances will enable us to improve ourselves with technology to become more capable in our surroundings.

What is the most important thing you've learned in school?

Being uncomfortable is a sign of growth. When I came to college, I thought a lot about how mature I should be. I was awed by all the student tour guides, tutors and residence advisors. Inside, I still felt like a kid. To be honest, I still do, but here's a story about how I tried to develop myself early in my college career.

I received much inspiration from my high school friends and how they were doing in their new colleges and began researching into how I could develop my own social and communication skills. College is a place to network, meet new people, and learn new things, why not take advantage of that and practice my interpersonal skills? I plopped myself down with a random person at dining hall nearly every meal for a quarter. It was a bit of a crazy idea, but I took notes on our interactions and met some really cool people! I got more comfortable with asking for permission to sit with random people, identifying who would be open to chatting, and carrying on a conversation. I'm still not perfect at it, but throwing myself out there gave me many more learning experiences than I could have collected by traditional means. College is one of the safest places to make mistakes. Embrace awkwardness and being uncomfortable.

What advice would you give to other students entering college and considering studying your major?

Two big pieces of advice for students going to college studying engineering: (1) get involved in leadership if you haven't had too much experience with this, and (2) participate in hands-on projects.

Leadership for an engineer is incredibly important. I have found that having leadership skills plays a major role in any project or hackathon. The best teams are where the members each take the initiative to do their own part, speak their own minds, and contribute the most that they can. Being organized and able to communicate with each other saves a lot of work and headache, and delegation is important for any project. Thus, if these are skills you feel like you can improve upon, get involved with a student organization that trains you in this aspect. In a student organization, you will be able to put your leadership and organizational skills to the test and make all the mistakes you need in order to be able to make this form of working with others second nature. In the future, such fail-safe environments will be less readily available, so it is important to get it in college when you can.

Projects are a great way to solidify what you learn in class and test your adaptability to new problems and challenges. Doing classwork is not enough. As an engineering major, you will need to put your new-found theoretical skills to work and build projects from start to finish. This will give you an experience to talk about when interviewing for a job or graduate schools. Projects represent what you will be doing in the real world (with skills ranging from teamwork, organization, and technical skills), so everyone will

Two big pieces of advice for students going to college studying engineering: *(1) get involved in leadership* if you haven't had too much experience with this, and *(2) participate in hands-on projects.*

GEELING ALINA CHAU

be interested in what you put your free time into. Not knowing enough is not an excuse for not trying. Try your best to ask around, figure things out, and make what you want to happen happen. Even if it's a simple project, anything that will challenge you to learn new things will be a step in the engineering direction.

Of course, all these things will overwhelm you at first, so it is important to remember that all will be okay, and that everyone in college is learning and growing. Give yourself time to reflect and breathe. Be patient with yourself and know that stretching yourself out and making yourself uncomfortable means that you are growing. You will be embarrassed sometimes and feel awkward at other times, but it's all a part of the process.

I Make AN Impact

2018 By the NUMBERS

IEEE-HKN chapters and committees were hard at work in 2018.
Positive measures of organizational health include the following summaries.

13 IEEE Leaders were Inducted **AS PROFESSIONAL MEMBERS** into the Eta (at-large) Chapter at Three IEEE Events *(see Figure 5)*

REPRESENTS 1

48 Chapters Achieved **KEY CHAPTER STATUS**

REPRESENTS 10

141 Chapters Submitted **INDUCTIONS** (**15.99** average inductions per chapter)

REPRESENTS 10

141 Chapters Submitted **ANNUAL REPORTS**

REPRESENTS 10

2,386 Students were **INDUCTED**

**More inductions will be reported in Q1 2019*

REPRESENTS 50

2018 Annual Report for IEEE-Eta Kappa Nu

2018 President Steve E. Watkins

It is with great pleasure that I present to you the 2018 Annual Report for IEEE-Eta Kappa Nu (HKN), an honor society that is growing in size, stature and significance.

HKN students, volunteers and staff collaborated to make 2018 one of the society's most impactful yet.

At the end of 2018, HKN membership exceeded 200,000, and the collegiate chapter charters totaled 263. Just a quick glance at the graphics, you will see that:

- We chartered nine new chapters, six of which are international.
- Students devoted over 80,000 community service hours and reached more than 88,000 community members.
- 10 percent – or 27 chapters – were named Outstanding Chapters for 2017-2018 as they embodied Eta Kappa Nu's ideals of scholarship, character and attitude.

Fig. 1. Department chairs accepting recognition of the outstanding chapters for 2016-2017 at the Electrical and Computer Engineering Department Heads Association meeting in March 2018.

Photo Credit: Dallas Ostin

The entire Board of Governors is proud of what we accomplished in 2018. More importantly, we see 2018 as a jumping off point for 2019 and beyond. We will continue to build on the services and programs we have to support our chapters. We will leverage successful partnerships and seek out new ones to further our goals.

I welcome you to review the report on the next few pages and see the impact IEEE-HKN is having on the world.

IEEE-HKN 2018 OVERVIEW

Active collegiate chapters are present in 14 countries in which they support engineering departments primarily in the disciplines of electrical and computer engineering. Currently, four alumni chapters contribute to chapter engagement with working members. The activities of these honor society chapters complement, but are independent of, the programs for IEEE student branches. Chapters are noted for positive contributions to their host institutions. Top chapters are recognized at the annual meeting of the Electrical and Computer Engineering Department Heads Association. Figure 1 shows the latest presentation to the 24 top chapters.

The guiding ideals of HKN are scholarship, character, and attitude. Membership eligibility is based on

HISTORY

IEEE-Eta Kappa Nu (IEEE-HKN) is the honor society for IEEE. It has been promoting excellence in the profession and in education since its founding as an independent organization in 1904. It has been part of IEEE since 2010. Election to membership is a lifelong designation for engineering students or working engineers who have distinguished themselves professionally. Its emphasis is in the disciplines of electrical engineering, computer engineering, computer science, and other IEEE fields of interest.

Fig. 2. Examples of chapter activities: Recognition of *Scholarship*, Service demonstrating *Character*, and Teamwork reflecting *Attitude*. *Photo (on right) Credit: Kayla Ninh*

these ideals. Membership for undergraduates and graduate students is an early indicator of career success and becomes a part of members' permanent IEEE record. Many professionals also are elected to membership through collegiate chapters or the Eta (at-large) Chapter of the Board of Governors. Chapters support the HKN ideals as well as through activities including recognition, community service, and professional engagement, see Figure 2.

Fig. 3. University of Florida President (and HKN member) W. Kent Fuchs (right) and 2018 HKN President Steve E. Watkins at the 2018 SLC. *Photo Credit: Dallas Ostin*

The governing body and staff of IEEE-HKN advance the honor society mission with signature programs and operational support. The annual October Founders Day promotion encourages chapters to celebrate HKN and to engage in local service. The annual Student Leadership Conference (SLC) provides opportunities for networking and professional development. The 2018 SLC was hosted by the Epsilon Sigma Chapter at the University of Florida. In Figure 3, Dr. W. Kent Fuchs, University President and HKN Member, welcomes HKN to Gainesville, Florida. The annual HKN awards program recognizes excellence at all levels. THE BRIDGE, HKN's digital magazine, connects chapters, members and others in the profession and industry. The issue cover shown in Figure 4 received an APEX Award in 2018.

The Board held a series of chapter leader and chapter advisor discussion tele-meetings, led a series of focus groups to journey map the member and advisor experience, conducted a reader survey for THE BRIDGE magazine, and continued a social media presence on Facebook, LinkedIn, and Twitter.

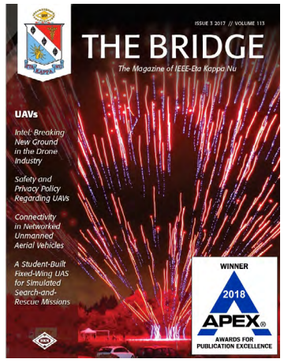


Fig. 4. THE BRIDGE Magazine wins its fifth consecutive APEX Award of Excellence for the October 2017 Issue Cover.

HKN CHARTERED **9 NEW CHAPTERS** IN 2018 FOR A TOTAL OF **263 CHAPTERS ACROSS 10 REGIONS.**

Region 1-6:

- **Mu Rho** at Valparaiso University, Indiana
- **Mu Phi** at the University of California, Santa Cruz
- **Mu Chi** at the University of Evansville, Indiana

**The induction group for the Mu Rho Chapter at Valparaiso University is shown in *Figure 6*

Regions 7-10:

- **Lambda Phi** at Khalifa University, United Arab Emirates
- **Lambda Lambda** at American University of Sharjah, UAE
- **Mu Pi** at G. H. Raisoni College of Engineering Nagpur, India
- **Mu Beta** at Arab Academy of Technology, Egypt
- **Mu Sigma** at National Chiao Tung University, Taiwan
- **Mu Tau** at Waseda University, Japan

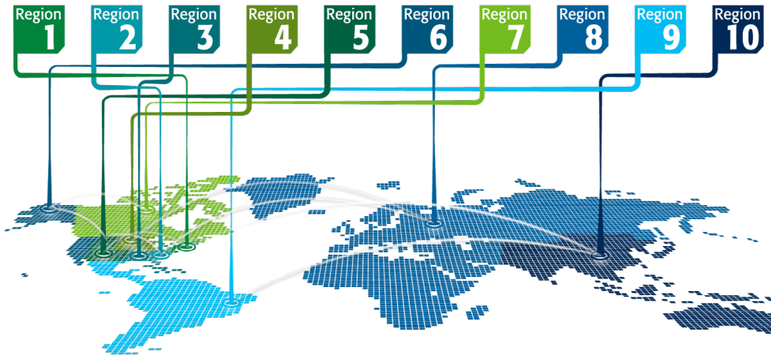


Fig. 5. Induction of Professionals into the Eta (At-Large) Chapter.

The Eta Kappa Nu awards program and partnerships show wide engagement in the professional community. HKN has especially close connections with IEEE-USA, the Computer Society, and the Education Society within IEEE. Select engagements are listed below.

- An awards presentation for the Outstanding Chapters and the Zerby-Koerner Outstanding Students was held at the annual meeting of Electrical and Computer Engineering Department Heads Association (ECEDHA).

Fig. 6. The Mu Rho Chapter was chartered at Vaparaiso University, Indiana, US.

- An awards presentation for MacDonald Outstanding Teaching, Karapetoff Outstanding Technical Achievement, and Distinguished Service were held in conjunction with the awards program of IEEE Educational Activities.
- The 2018 SLC included programs and contributions from the University of Florida, IEEE N3XT®, and EPICS in IEEE and additional support from Intel and IEEE Young Professionals.
- HKN organized a student workshop "Pathways to Industry" as part of the ECEDHA meeting. HKN organized a session and exhibited at the 2018 Technology Time Machine Conference.
- HKN was an exhibitor at the IEEE/ASEE Frontiers in Education Conference.

Fig. 7. Networking at the Pathways to Industry program during the ECEDHA meeting. HKN Alumni Chair Dennis Leitterman (right) speaks with students Katelyn Brinker and Jerrell Gardner.

During 2018, the HKN Board addressed operations by formalizing a job description for regional governors and a Board Secretary position, and preparing for the 2019 Student Leadership Conference (SLC) in Boston, MA. In addition, the Board of Governors established specific 2018 initiatives within the following **five priority areas:**

Financial Security

Faculty Advisor Support

Student Conferences

Awareness and Branding

Chapter Experience

Fig. 8. Chapter Directory Information for the Mu Nu Chapter at the Politecnico di Torino, Italy.

Advances in these areas include expanding the donor base, revising resources for faculty advisors, instituting an advisor recognition program, improving SLC documentation, preparing new promotional documents and items, updating public information (i.e. social media, Wikipedia, and the Engineering and Technology History Wiki), approval of a job board as a member benefit, and developing video resources to model the induction ceremony.

The new resources are currently being made available. The official HKN website continues as an ongoing project. During 2018, the governance section and the chapter directory were emphasized to provide greater operational transparency and expanded chapter visibility. Figure 8 shows one of the seventy-two active directory pages for chapters.

IEEE-Eta Kappa Nu moves into 2019 with a list of annual initiatives and a consensus on strategic goals. **The Board of Governors approved the following areas for strategic improvement:**

IEEE-HKN SHOULD PROVIDE clear **member benefits** related to career development

IEEE-HKN SHOULD ENCOURAGE members to **make an impact** through service

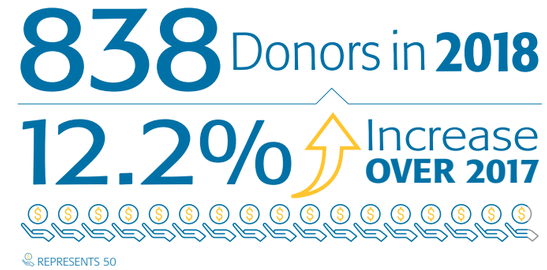
IEEE-HKN SHOULD DEVELOP strong **donor relationships**

FINANCIAL HEALTH

IEEE-HKN is funded through returns on an endowment that is managed by the IEEE Foundation, generous donations from individuals, a portion of the one-time induction fee for new members, and sales from the HKN store. Expenses include operational expenses (i.e. conferences, meetings and chapter infrastructure), HKN staff compensation, and volunteer expenses. Details are shown in accompanying charts. These charts illustrate that IEEE-HKN is efficiently managed, and the majority of our expenditures directly benefit our members and chapters through services and programs. Our income primarily is from our endowment and student dues and fees.

However, our current funding level does not enable IEEE-HKN to meet the needs of our expanding program, increased membership and active chapters, as well as to fulfill the lifetime member experience that defines the society.

To meet those needs, IEEE-HKN will need to increase revenue from individual donors and corporate support. The need is anticipated to be an additional $200,000 per year. This type and amount of support

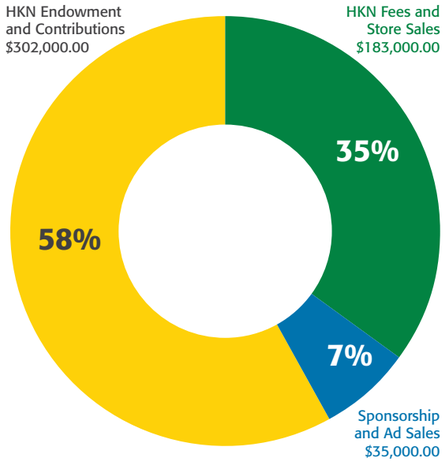


is necessary for HKN to grow and improve its support and reach. As such, the Board has made this a priority for 2019.

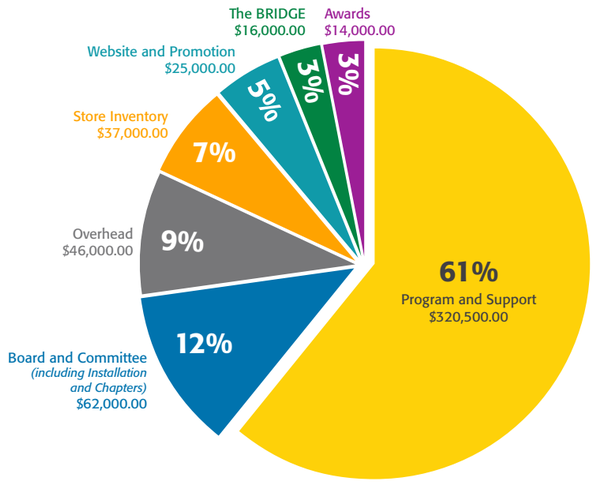
Donations in 2018 to IEEE-HKN were made to the general fund or to specific programs, such as the Student Leadership Conference. The organization is one of the programs of the IEEE Foundation and is included in annual campaigns.

Much of the year-over-year growth is attributed to a generous donation to the Madni Family Fund, which was established to endow a new award program and other programming enhancements specifically for IEEE-HKN. Details will be developed in 2019.

HOW IEEE-HKN IS FUNDED



HOW FUNDS ARE DISTRIBUTED



ACKNOWLEDGMENTS

The vision of the founders of HKN was to create an honor association that promotes excellence within the discipline while supporting members in all aspects of their professional careers. As HKN and now IEEE-HKN, the organization has a strong history of connecting students, working professionals, and retirees to benefit the profession as a whole, as well as the individual members. This vision and the ideals of scholarship, character and attitude guide each generation of HKN leaders.

The accomplishments of 2018 were a result of the dedication and efforts of student officers, chapter advisors, professional volunteers, IEEE staff, and others. In particular, the work of the 13 members serving on the 2018 Board of Governors, the HKN Director and Program Manager, and the volunteers on 19 standing and ad hoc committees is gratefully acknowledged. The 2018 Board of Governors and staff are shown in Figure 10.

Fig. 10. The 2018 Board of Governors and Staff.

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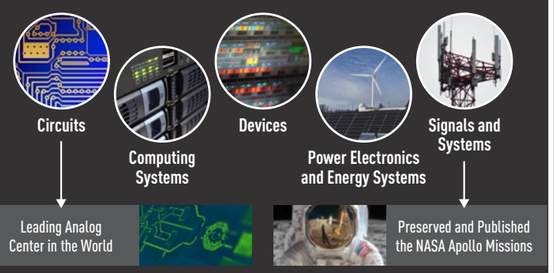

ece.utdallas.edu
ecegradprogram@utdallas.edu

UT DALLAS

Special Graduate School edition coming out in October 2019

The issue will focus on the programs available, the opportunities graduate schools can provide and expert advice for students. Reach the top electrical, electronics, computer science and computer engineering students from around the globe. **More than 34 percent of IEEE-HKN undergraduates go on to graduate school.**

Contact Christine Cherevko at c.cherevko@ieee.org to reserve your spot in this special edition and show off your graduate school program. **Space is limited.**

HKN | IEEE

THE UNIVERSITY OF TEXAS AT DALLAS

TEXAS INSTRUMENTS ANALOG EXCELLENCE GRADUATE FELLOWSHIP

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Fellowship Benefits*

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IEEE-HKN Founders Day 28 OCTOBER

Chapters Everywhere Celebrate Founders Day!

Chapters everywhere celebrated Founders Day on 28 October in all sorts of ways, including pizza parties like this one sponsored by the Mu Alpha Chapter at UCSI University in Kuala Lumpur.

On Friday, 26 October, the Gamma Theta – Missouri S&T chapter decorated the ECE Lobby and hosted a social time with a Founders Day cake, which they apparently really enjoyed.

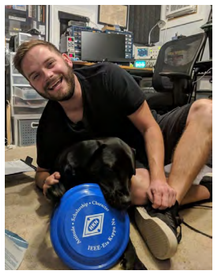
The IEEE-HKN Kappa Psi chapter at the University of California, San Diego hosted a Destresser BBQ! Officers prepared fresh food to be grilled, and members/inductees were able to enjoy a free meal and mingle with each other. The outdoor setting proved to be a great way for students to escape their studies for just a bit and celebrate the HKN community at UC San Diego.

The Lambda Omicron chapter at Miami University hosted a picnic in a local park and invited all Electrical and Computer Engineering students and faculty. Special invites were sent to students who qualified but have not yet joined the chapter so they could interact with current chapter members. The event enabled members to help spread awareness of chapter activities and of IEEE-HKN as a whole to help increase interest in the organization, as well as to celebrate Founders Day through sharing good food with good people. The event was two hours long and saw a steady stream of people coming and going.

On 26 October, the Mu Rho chapter at Valparaiso University inducted seven members into the chapter. On 28 October, the chapter held a social event for new and continuing members, during which an engineering-related movie was viewed in the theater room of a local business.

The Theta Mu chapter at Stony Brook University celebrated Founders Day with a social event on Halloween. Thus members came in costume while participating in chapter activities. Activities included the HKN JeoPARODY game (which was downloaded from the HKN newsletter), a circuit analysis problem (difficulty depended on students' years), and a soldering station for a switching LED circuit with PNP transistors. Snacks, drinks and of course candy were served. The chapter opened the event to IEEE student members, not only HKN members in an effort to spread awareness of our Honor Society to the current Freshman and Sophomore students and to encourage their academics and joining the Theta Mu chapter.

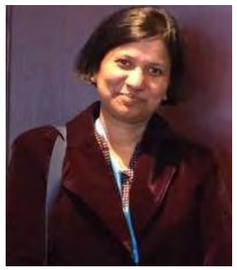
Zeta Beta HKN Members from Texas A&M University in Kingsville commemorated Founders day by planning upcoming community service events, leadership activities, and fundraising events. At the conclusion of the meeting, a social was held for current, potential, and IEEE members. During the social, participants enjoyed refreshments and watched the classic IEEE-HKN recruitment video. Everyone involved was able to discuss everything the local HKN chapter is all about!



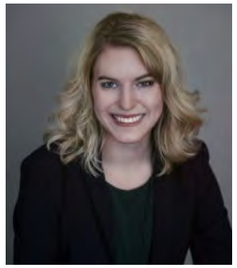
Many chapters used the day to promote HKN on their campuses. Others made sure that their pumpkin carving skills were put to good use, and others showed off their technical skills at a game. Man's best friend even took part in the festivities!

IEEE-HKN Welcomes New Members of the Board of Governors

The 2019 IEEE-HKN Board of Governors welcomed three new members, and a fourth member was elected to a regional governor position after having served as Student Governor for the past two years.



Dr. Preeti Bajaj was elected as Governor At-Large in the November 2018 elections. She is Director of G.H. Raisoni College of Engineering, Nagpur, India, with 5,500 students. Her major contribution is in design and development of driver assistance systems, such as a driver's fatigue detection system and driver's action and emotion detection system, and driver's behavior modeling and applying hybrid fuzzy/genetic/PSO to various Intelligent Transportation Systems.



New Student Governor **Katelyn Brinker** is pursuing her M.S. degree in electrical engineering at Missouri University of Science and Technology (Missouri S&T) with the support of a NASA Space Technology Research Fellowship. She is the recipient of the DiscoverE New Faces of Engineering 2017 IEEE-USA award and the HKN 2017 Outstanding Student Award.

New Student Governor **Panagis Samolis,** is pursuing a PhD in Electrical and Computer Engineering at Boston University. He is conducting interdisciplinary research on the use of ultrafast sources for super-resolution photothermal imaging of biomedical samples and characterization of nanomaterials. He has given two poster presentations (Boston Centennial 2018, MRS), an invited talk at SPIE Optics and Photonics 2018 and an SPIE proceeding.

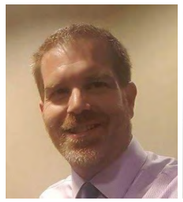
Michael Benson was elected as Governor for Regions 3-4 in November after having served as Student Governor in 2017 and 2018. He is a PhD candidate at the University of Michigan's Radiation Laboratory, where he is studying multi-modal remote sensing of the environment with a focus on radar. He led the IEEE-HKN Ritual Committee and is a member of the society's strategic planning committee.

Dr. Karen Panetta, a Fellow of the IEEE, has assumed the position of President for the 2019 year. She is the Dean for Graduate Education and a Professor of Electrical and Computer Engineering and Adjunct Professor in Computer Science at Tufts University in Massachusetts.

Dr. Edward Rezek, also an IEEE Fellow, is President Elect this year. He retired after 35 years from Northrop Grumman Space Technology. He has received 19 patents and has more than 50 publications in refereed journals.

Dr. Steve E. Watkins, an IEEE Senior Member, is Past President for 2019. He is currently a Professor of Electrical and Computer Engineering at Missouri University of Science. He received the IEEE-USA 2016 Jim Watson Student Professional Achievement Award.

ROUNDING OUT THE BOARD ARE:



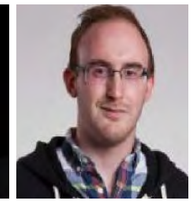
Sean Bentley
Governor for Regions 1-2

Rakesh Kumar
Governor for Regions 5-6

Enrique Tejera
Governor for Regions 7-10

James M. Conrad
Governor At-Large

John DeGraw
Governor At-Large



Kyle Lady
Governor At-Large

Please click this link for more information about the IEEE-HKN Board of Governors.

Gamma Chapter Member Named IEEE-HKN Outstanding Student of the Year for 2018

Ramandeep Vilkhu, who was inducted into the Gamma Chapter of IEEE-HKN at The Ohio State University, has been selected as the 2018 Alton B. Zerby and Carl T. Koerner Outstanding Electrical or Computer Engineering Student Award recipient.

He is currently pursuing his Ph.D. in Electrical Engineering at Stanford University.

He holds a patent for "Power Harvesting from Fabric Electrochemistry." His undergraduate thesis focused on the use of fabrics to provide power generation capabilities and resulted in numerous IEEE scholarships and a journal presentation.

Joel T. Johnson, Professor and Department Chair for Electrical and Computer Engineering at The Ohio State University, said Ramandeep "received high praise for the support he provided, and for his thorough, fair, and caring grading and feedback on student assignments" as a teaching assistant.

"The external impact of his research topics in future medical wearable technologies to support patient treatment and monitoring further represents another important aspect of his service to community and country," Johnson wrote in a recommendation letter.

"I am honored to be presented with the IEEE-HKN Outstanding Student Award," Ramandeep Vilkhu said.

> *The work that the organization does to further advancement both inside and outside the classroom for the field of electrical engineering is inspiring,* and I am truly humbled to join the list of amazing students that have come before me and represented the IEEE-HKN organization. I would like to extend a special thank you to everyone at The Ohio State University that made this possible -- I can't be more proud to represent the Buckeyes at IEEE-HKN international!

Ramandeep will receive his award on Monday, 25 March 2019 during the annual conference of the Electrical and Computer Engineering Department Heads Association (ECEDHA).

Honorable mentions for the Outstanding Student Award were given to Li Guan of the Gamma Theta Chapter at Missouri University of Science and Technology, and Carrie Smith of the Mu Iota Chapter at Seattle University.

27 Chapters Earn 2018 Outstanding Chapter Award

The IEEE-HKN Board of Governors has conferred upon 27 student chapters the distinction of Outstanding Chapter for 2018. This represents the top 10 percent of all HKN chapters worldwide.

The Outstanding Chapter Award (OCA) recognizes excellence in IEEE-HKN chapters for their activities. The award is based on the content and description of chapter activities that are documented in the Annual Chapter Report, which summarizes the chapter's activities from the previous academic year.

For the purposes of this award, emphasis is placed on service activities to the department, school, community and chapter. Equally important is promoting the goals of IEEE-HKN by inducting as many eligible undergraduate students, graduate students and faculty in the IEEE designated technical fields of interest as possible and by participating in IEEE-HKN student chapter projects.

The awards will be presented on Monday, 25 March 2019 during the annual conference of the Electrical and Computer Engineering Department Heads Association (ECEDHA). Each recipient chapter receives an engraved plaque.

The chapters recognized as 2018 Outstanding Chapters are:

Alpha
University of Illinois at Urbana–Champaign

Beta
Purdue University

Beta Epsilon
University of Michigan Ann Arbor

Beta Eta
North Carolina State University

Beta Omega
University of Connecticut

Beta Theta
Massachusetts Institute of Technology

Delta Omega
University of Hawaii at Manoa

Delta Omicron
University of New Mexico

Delta Pi
Colorado State University

Epsilon Xi
Wichita State University

Epsilon Sigma
University of Florida

Epsilon Eta
Rose-Hulman Institute of Technology

Epsilon Iota
San Jose State University

Gamma Mu
Texas A&M University

Gamma Rho
South Dakota State University

Gamma Tau
North Dakota State University

Gamma Theta
Missouri University of Science and Technology

Iota Gamma
University of California, Los Angeles

Kappa Psi
University of California, San Diego

Lambda Tau
University of Puerto Rico at Mayagüez

Lambda Zeta
University of North Texas

Mu
University of California, Berkeley

Mu Alpha
UCSI University–Kuala Lumpur

Mu Nu
Politecnico di Torino

Nu
Iowa State University

Sigma
Carnegie Mellon University

Zeta Beta
Texas A&M University–Kingsville

IEEE-HKN Announces Recipients of its Top Professional Awards

Stephen M. Goodnick, Ph.D., a professor of electrical engineering at Arizona State University's Ira A. Fulton Schools of Engineering, was awarded the 2018 IEEE-Eta Kappa Nu (IEEE-HKN) Distinguished Service Award; Ward Jewell, Ph.D., a professor at Wichita State University, was awarded the 2018 C. Holmes MacDonald Outstanding Teacher Award; and Mau-Chung Frank Chang, Ph.D., President of National Chiao Tung University in Taiwan, was awarded the 2018 Vladimir Karapetoff Outstanding Technical Achievement Award.

The awards were bestowed upon the recipients by IEEE Vice President for Educational Activities Witold M. Kinsner and Steve E. Watkins, 2018 IEEE-HKN President, at IEEE's Educational Activities Board Awards ceremony held 16 November 2018 in Vancouver, British Columbia, Canada.

Arizona State University Professor **Dr. Stephen M. Goodnick** Recognized for Leadership and Commitment

Professor Goodnick was singled out for "exceptional leadership and long-term support and service to Eta Kappa Nu and IEEE-Eta Kappa Nu members, chapters and volunteers."

He served as 2012-2013 President of the IEEE Nanotechnology Council and as President of IEEE-Eta Kappa Nu Board of Governors for 2011-2012. He is currently the deputy director of ASU Lightworks in the Julie Ann Wrigley Global Institute of Sustainability.

He has published more than 400 journal articles, books, book chapters and conference proceedings, and has been a Fellow of IEEE since 2004 "for contributions to carrier transport fundamentals and semiconductor devices."

Professor Goodnick's main research contributions included analysis of surface roughness at the Si/SiO2 interface, Monte Carlo simulation of ultrafast carrier relaxation in quantum confined systems, global modeling of high frequency and energy conversion devices, and fabrication and characterization of nanoscale semiconductor devices.

Wichita State University Professor **Dr. Ward Jewell** Recognized for His Dedication to Student Success

Ward Jewell, Ph.D., was awarded the C. Holmes MacDonald Outstanding Teacher Award for his "caring, knowledgeable approach to teaching and mentoring at all levels in his specialization."

Dr. Jewell began his career at the Oak Ridge National Laboratory in the Power Systems Technology Program. He later spent 32 years teaching electric energy engineering at Wichita State University in Kansas.

During that time, he advised 17 Ph.D. and 90 M.S. students and taught "countless" undergraduates.

Dr. Mau-Chung Frank Chang Recognized for Pioneering Research in High-Speed, High-Frequency Semiconductor Devices, Materials and Integrated Circuits

Mau-Chung Frank Chang, Ph.D., President of National Chiao Tung University in Taiwan, was awarded the Vladimir Karapetoff Outstanding Technical Achievement Award for his "transformative contributions in undergraduate engineering education and for pioneering research in high-speed,

IEEE-HKN Awards

high frequency semiconductor devices, materials, and integrated circuits."

Dr. Chang, also the Wintek Chair in Electrical Engineering and Distinguished Professor at the University of California, Los Angeles, has primarily focused on research and development of high-speed semiconductor devices and integrated circuits for radio frequency and mixed signal, radar and imaging Systems-on-Chip applications, all of which are used in handheld device technology.

Dr. Chang has published more than 450 technical papers and holds more than 50 US patents. He has graduated more than 45 Ph.D. students and 85 M.S. students at UCLA.

The IEEE-HKN Distinguished Service Award was initiated in 1971 to recognize those members who have devoted years of service to Eta Kappa Nu, resulting in significant benefits to all of the Society's members. The award is based on lifetime contributions to IEEE-Eta Kappa Nu.

The C. Holmes MacDonald Outstanding Teaching Award recognizes the central and crucial role of college professors in training and motivating future engineers in the IEEE fields of interest. The program attempts to identify and give recognition to electrical engineering professors who have demonstrated, early in their careers, special dedication and creativity in their teaching responsibilities. Thus it is, in part, a counter-balance to the significant pressure for research and publication performance on young professors, and a re-affirmation of the basic and essential need of excellence in teaching.

The Vladimir Karapetoff Outstanding Technical Achievement Award recognizes career accomplishments of a practitioner of electrical or computer engineering who has distinguished him or herself through an invention, development, or discovery in the field of electrical or computer technology.

Reach Out to Your Community with IEEE-USA E-BOOKS

Georgia C. Stelluto

Looking for a way to fulfill your community service requirement and have fun in the process? IEEE-USA E-BOOKS has the answer.

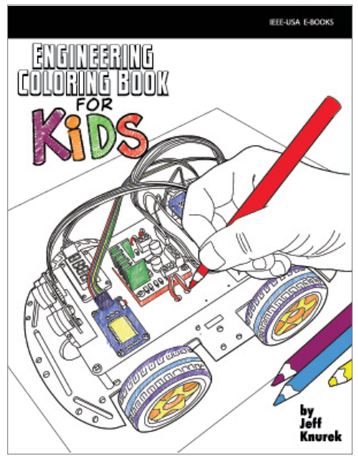
IEEE-USA E-BOOKS offers a library of more than 250 e-books and audio books for children, students, young professionals and mid-to-late career engineers on a variety of engineering career guidance and development, government relations, and skills and best practices. IEEE-USA offers members a free monthly e-book or audio book selection, as well as significant member discounts. Members can download their free monthly e-book or audio book, as well as purchase many IEEE-USA E-BOOKS for only $2.99 at https://ieeeusa.org/shop/

If you want to find ways to work with younger children and teach them about technology, perhaps you would consider using an IEEE-USA E-BOOK to educate them about engineering in a fun way.

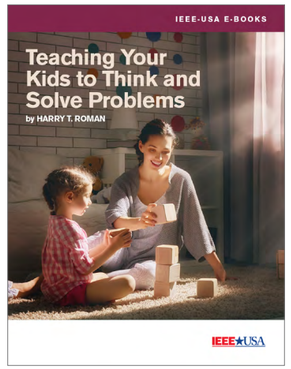
For instance, the e-book library contains a very creative book for young children, written by a middle school student – IEEE-USA's youngest published author. In 34 colorful, imaginative pages, Abigail and The Fish Tree, by Sonali Ranawweera, relates the story of a young girl who uses her curiosity and creativity to produce a gardening wonder in her family's backyard. When she sees that the fish tree she grew is not perfect – she instinctively does what almost any inventor knows: makes plans to improve the next version.

Intended for children ages 5 to 8, Abigail and The Fish Tree promises to become a valuable tool for encouraging youngsters to both enhance their reading skills and explore their creativity. Older elementary and middle school students also can use the e-book for writing assignments, as an example of how to use their imaginations. This book is available to IEEE members as both a free audio book download in MP3 format, and for purchase as an e-book for $2.99.

In early January, IEEE-USA E-BOOKS released another fun way for children to learn about engineering – the IEEE-USA Coloring Book for Kids, specially created by award-winning Jumble cartoonist Jeff Knurek. The coloring book is a collection of 25 full-page designs, developed to teach children about science and technology, while also providing a fun means of self-expression. If you want to nurture a youngster's creative spirit while also encouraging them to learn about technology, this imaginative new coloring book for kids from IEEE-USA E-BOOKS may be the perfect resource. Available for $2.99 for members.



And through 15 March, IEEE-USA's free e-book for members is Teaching Your Kids to Think and Solve Problems.

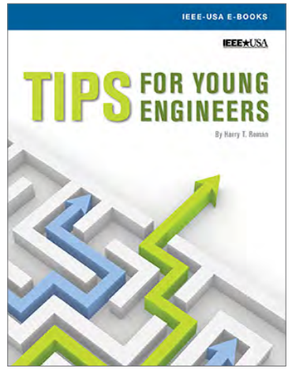


Learning is not something you just do in school, or to be left solely in the hands of school teachers. So, why not take an active interest in helping children solve problems?

Challenge children with fun and practical, real-world problems they will probably encounter in their adult lives. Such exercises are likely to decrease their fear of problem-solving; put them in your shoes; demonstrate to them how adults solve problems; promote familiarity with problem-solving; build confidence and self-esteem; illustrate how math is -- and will be -- used every day in their adult lives, and help organize their thinking skills.

Through 15 March, you can download this free e-book, by going to: https://ieeeusa.org/shop/careers/ebook-teaching-kids-think-solve-problems/ Log in with your IEEE member number, add the book to your cart, and use promo code **FEBFREE19** at checkout.

You might also consider downloading IEEE-USA's **free audio book**: Tips for Young Engineers. Veteran author and educator Harry T. Roman has written a career guidance and development e-book, now available as a free audio book. Packed with solid, practical advice, Tips for Young Engineers offers dozens of useful, career-building ideas the author acquired during his 36-year career with Public Service Electric and Gas Company (PSE&G), the largest utility serving New Jersey. In nine concise chapters, one for each major facet of developing a technical career, the author discusses specific steps young engineers can take to advance themselves — for both immediate and long-term benefits. This audio book also is available as an e-book for purchase at a discount of $5.99 for members. Non-members pay $7.99.



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Consider holding a special "library corner" for kids in your local libraries and schools, using IEEE-USA's audio books and e-books, to help children in your community learn about engineering and technology. It would be a great way to fulfill your community service requirement, and have a lot of fun in the process.

Georgia C. Stelluto is IEEE-USA's Publishing Manager, Manager/Editor of IEEE-USA E-BOOKS, Co-Editor of IEEE-USA Conference Brief, and Department Editor for InFocus for IEEE-USA Insight.

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