



# The Integrator

## UW EE Welcomes New Faculty



Sreeram Kannan, Baosen Zhang and Sam Burden, from left.

Chair's Message	2
Faculty Awards	2
Lytle Lecture	3
Women in Engineering	4
Student Fellowships	5
Loew Scholarship	6
EE on the Road	7
New BS-MS Degree	7

If good things come in threes, faculty hires are no exception. UW EE welcomes three new assistant professors: Sreeram Kannan, Baosen Zhang and Sam Burden. Kannan joined the department this fall, Zhang starts in spring 2015 and Burden arrives in fall 2015.

### Sreeram Kannan

Sreeram Kannan joined UW EE this fall, coming from the University of California, Berkeley, where he was a postdoctoral researcher.

Originally from Chennai, in south India, Kannan moved to the U.S. to complete his doctoral studies. Kannan selected UW EE because of the collaborative atmosphere of faculty and UW's reputation as a leader in genome sciences and the analysis of large datasets, both of which overlap with his research area.

"I had several offers from top schools around the country and chose UW because of its vibrancy, dynamism and strength in interdisciplinary research," Kannan said.

Kannan and his wife were happy to relocate to Seattle to enjoy "the pristine air, vivacious trees and majesty of Mount Rainier."

### Education

- Ph.D. Electrical Engineering and M.S. in Mathematics, University of Illinois, Urbana-Champaign, 2012
- M.Eng. Telecommunications, Indian Institute of Science, India, 2008
- B.Eng. Electronics and Communication, Anna University, India, 2006

### Research

Kannan's research interests are centered around information theory, which deals with the fundamentals of information processing and transmission, and its application to genomics and wireless networks.

### Baosen Zhang

Baosen Zhang will join UW EE in spring 2015. Zhang is currently a postdoctoral scholar at Stanford University.

"What I'm looking forward to most is working with students," said Zhang. "There are a lot

See NEW FACULTY, page 5



## Message From The Chair

Dear EE Community:

Autumn 2014 has arrived and I'm excited to see the return of students. This year there are some new faces as well as some departures, with colleagues moving onward and upward. Perhaps most notable, Vikram Jandhyala completed his term as the Electrical Engineering Department Chair and was immediately selected as the Vice Provost for Innovation, running the UW Center for Commercialization. As we begin the search for the next Department Chair, I am delighted to serve as Interim Chair.

The Department welcomes several new faculty this fall, including Sam Burden, Sreeram Kannan, Baosen Zhang and Arka Majumdar, who was hired last year but started this fall. Their research areas span the wide field of electrical engineering topics. I hope you were able to enjoy Arka's seminar on September 30 titled Low Power Optoelectronics Enabled by Nanophotonics. If not, you can find a recording of it on our Department Web pages. If you weren't able to join us for the Lytle Lectures on October 20-21, you may also view the talks online to learn about the future of wireless technology.

Several Electrical Engineering Professors have been featured in the news recently. Matt Reynolds, Joshua Smith and Shwetak Patel continue to get media attention for their novel inventions in cell phone technology, wireless power and energy management. Blake Hannaford and Howard Chizeck also made waves with their startup companies. EE faculty were involved in five of the 17 startups that originated at UW last year, demonstrating their vitality and creativity.

The EE Department was the top producer of engineering degrees in the College of Engineering last year, with a total of 178 bachelor's degrees awarded. We anticipate growing in coming years to educate even more engineers for the high tech jobs that are in demand, especially in Seattle.

John Sahr  
Professor & Interim Chair



## Four Faculty Awarded

Congratulations to the four Electrical Engineering faculty who received awards at the Institute of Electrical and Electronic Engineers (IEEE) Seattle 110th Anniversary Gala on October 19.

### Mohamed El-Sharkawi

UW EE Professor Mohamed El-Sharkawi is the recipient of the 2014 IEEE Outstanding Educator Award for Region 6 (Western United States). With 35 years of teaching experience, El-Sharkawi specializes in renewable energy, smart grid and intelligent systems. He has authored four textbooks and with colleagues developed online courses for power engineers called the Northwest Workforce Training on Smart Grid.



### Bishnu Atal

UW EE Affiliate Professor Bishnu Atal received an IEEE 20th Century Landmark Award in recognition of his contributions to digital speech coding. Inspired by the high cost of long-distance phone calls to India, Atal invented efficient digital speech encoding, which produces high-quality speech with compressed bandwidth. This is now the standard for all modern digital voice coding for cell phones, Skype and more.



### Henrique Malvar

Chair of the UW EE Advisory Board, Henrique (Rico) Malvar, who is an EE Affiliate Professor, received an IEEE 20th Century Landmark Award for his contributions to multiresolution signal processing and media compression standards. A Chief Scientist for Microsoft Research, Malvar worked on the video compression format H.264, which is now the most widely used video format for digital TV and Internet video.



### Li Deng

UW EE Affiliate Professor Li Deng received an IEEE Region 6 Outstanding Engineer Award for his contributions to deep machine learning and neural networks. A Principal Research Manager at Microsoft Research, Deng's work has impacted speech recognition and areas of information processing and is used in Microsoft speech products and text and data products.





# Annual Dean W. Lytle Lecture Draws a Crowd

## Featured Speaker Developed MIMO Antennas

The past, present and future of wireless technology was, appropriately enough, a timely topic for the seventh annual Dean W. Lytle Electrical Engineering Endowed Lecture Series. Alumni, students and faculty gathered to hear Professor Emeritus Arogyaswami Paulraj, from Stanford University, give two talks October 20-21.

"It was interesting to learn about the developing technology and how each is more clever than the next," said Patrick Hall, BSEE 2001.

Paulraj, who revolutionized high-speed wireless with the development of MIMO antennas, gave a general audience talk on Monday, October 20, where he discussed the evolution of mobile air interface technology. Highlighting the various developments and motivation that led to 2G, 3G and 4G wireless, Paulraj said the future of 5G is still "hazy." The goal is for higher speed that will enable people to receive large files more quickly.

"I think it will be even more surprising," Paulraj said about 5G. "We are really only in the beginning."

Paulraj also presented a technical colloquium talk on Tuesday, October 21, where he described the drivers for 5G mobile standards and the various solutions consid-

## Miss the Lytle Lectures?

Videos from the general audience and technical colloquium lectures are available to watch anytime, anywhere: [www.ee.washington.edu/news/lytle\\_lecture.html](http://www.ee.washington.edu/news/lytle_lecture.html)

ered. He specifically discussed the use of massive MIMO in the millimetric band.

"The technology is rapidly changing," said Professor Emeritus Rubens Sigelmann. "This gives a general idea of where we are headed."

Paulraj joined Stanford in 1992 after spending several decades in the Indian Navy. During this time he founded three national-level laboratories in India and led the development of a world-class sonar system. Paulraj has received several recognitions including the 2011 IEEE Alexander Graham Bell Medal and the 2014 Marconi Prize and Fellowship.

The Dean W. Lytle Electrical Engineering Endowed Lecture Series is the Electrical Engineering Department's premiere annual event, featuring internationally renowned researchers in the field of communications and signal processing. The Lytle Lecture Series honors the 40-year career of late Professor Dean W. Lytle, who influenced many with his teaching.



Top Left: Interim Chair John Sahr, Arogyaswami Paulraj and Louis Scharf, Ph.D. 1969, from left.



Top Right: Arogyaswami Paulraj's general audience talk on October 20.



Dean Lytle's wife, two daughters and son-in-law.



Professor Matt Reynolds and Arogyaswami Paulraj.



UW EE alumni, faculty and staff at the reception.





Ph.D. candidate Nicole Nichols, Ph.D. graduate Jessica Tran, Ph.D. candidate Tamara Bonaci and master's degree student Cassandra Hooper at the career fair, from left. Bonaci and Tran are both past recipients of the Irene Peden Fellowship, established by the first female UW EE professor (more about Peden on page 6).

## Students Attend Women in Engineering Conference

The topic of women in engineering may not seem overly serious—until you ask women engineers for their perspective, that is.

To connect female engineering students with other women in the field, UW EE sent eight students to the Grace Hopper Celebration (GHC) of Women in Computing from October 8-10 in Phoenix, AZ. The GHC is the world's largest gathering of women in technology.

The eight women who attended are undergraduate students Ruiheng Wang, Amanda Loh and Neda Mohammadhosseini and graduate students Renshu Gu, Nicole Nichols, Victoria Zayats, Cassandra Hooper and Tamara Bonaci. This is the second year that graduate students attended the conference and the first year for undergraduates.

First-time attendee Tamara Bonaci, a Ph.D. student working in the BioRobotics Lab, was excited to ask well-known women in engineering for career advice.

"I am a strong proponent of the idea that diversity in engineering is crucial for success."

Tamara Bonaci,  
Ph.D. student

"The topic of women in engineering seems to be quite popular, doesn't it?" Bonaci said. "I am a strong proponent of the idea that diversity in engineering is crucial for success."

The importance of diversity in engineering is best summarized by computer scientist Bill Wulf, Bonaci said. In Wulf's article "Diversity in Engineering," he describes engineering as a creative profession. Without diversity in engineering, life experiences of engineers are limited and products are not invented, designed or built.

Fourth year Ph.D. student Yi (Eve) Zhao, who works in the Sensor Systems Lab, attended the conference in 2013. Prior to attending the conference, Zhao was hesitant about pursuing a career in engineering. After talking with other women, she felt more confident.

"At school, there are not many women in our department and sometimes I feel lonely," Zhao said. "I work well with men, but I like the way women collaborate."

A session at the conference also gave Zhao some insight into the psychological differences between men and women. Considering that women are strong communicators and have a supportive nature, they have a special role in the field when it comes to teamwork and leadership, Zhao said.

"We need more women to help improve the engineering field as well as introduce the beauty of engineering to women who are interested, but hesitate to work in the field," Zhao said.

See WOMEN ENGINEERS, page 6



# Graduate Student Receives Two Fellowships

In the Information Age, good news travels faster than ever before. So fast, in fact, that Vamsi Talla wasn't even the first to know he received one of two recent fellowships.

"Qualcomm announced the results on their Web site before sending out emails. One of my friends found out and messaged me about it," Talla said. "I thought he was joking, but when I went to the Web site I was pleasantly surprised."

Talla, a fifth year Ph.D. student, is the recipient of both a Qualcomm Innovation Fellowship and Intel Ph.D. Fellowship. Talla's primary research focus is developing battery free sensing, computational and communication platforms.

"Vamsi has really been on a roll! His work is having an impact in two important areas: Internet of Things and implanted biomedical electronics," said Electrical Engineering Assistant Professor Joshua Smith. "The Qualcomm and Intel awards are well-deserved national recognition of his work."

Nine Qualcomm Innovation Fellowships were awarded,

from an initial pool of 137 proposals. Talla received the fellowship with Vincent Liu, from UW Computer Science & Engineering, for their battery and infrastructure free devices project. The \$100,000 award funds ongoing research.

"The most important thing about the fellowship is that it validates the importance of our work and that other people are also interested and excited by our research," Talla said.

Nine Intel Ph.D. Fellowships were awarded and the fellowship supports Talla's final year in the Ph.D. program. The \$50,000 fellowship funds tuition, a stipend and travel. Talla, who submitted a one-page research statement as part of the application, said cumulative research, goals and accomplishments were taken into consideration.



## New Faculty

(Continued from page 1)

of exciting problems to be solved and I'm eager to start working on them."

Born in China, Zhang was a teenager when his family immigrated to Canada, where he completed his undergraduate work. Zhang joined UW EE for several reasons, including a culture that fosters the growth of junior faculty and research institutes such as the Clean Energy Institute.

"In the area that I work in (power and energy systems), UW is really a leader in the U.S.," Zhang said. "I feel that I can make the most impact by working here."

Zhang and his wife are looking forward to relocating to Seattle to enjoy the "unmatched combination of city life and outdoor activities."

### Education

- B.A.Sc. Engineering Science, University of Toronto, 2008

- Ph.D. Electrical Engineering and Computer Science, University of California, Berkeley, 2013

### Research

Zhang's research interest is in the area of energy systems, particularly the intersection between power systems control, economics and data analytics.

### Sam Burden

Sam Burden will join UW EE in fall 2015. Burden is presently a postdoctoral researcher at the University of California, Berkeley. It has been a dream of his to work for UW since attending a math camp on campus as a high school student in 2003.

"I'm most excited about the people," Burden said. "My future students, both in classes and my lab, colleagues and collaborators across campus."

Burden grew up in eastern Washington and Idaho. In his spare time, he teaches

robotics to students in K-12 classrooms, Maker Fairs and campus events.

"I had a phenomenal undergraduate experience in UW EE and am thrilled to return," Burden said.

Burden is excited to return to Seattle where he will have easy access to wilderness, seafood, coffee and music.

### Education

- B.S. Electrical Engineering, University of Washington, 2008
- Ph.D. Electrical Engineering and Computer Science, University of California, Berkeley, 2014

### Research

Burden develops sensorimotor control theory for neuromechanical and cyberphysical systems. Specifically, he focuses on enabling dynamic locomotion and dexterous manipulation in robotics, biomechanics and human motor control.



# Henry R. Loew Endowed Scholarship Established

## The Century Long Loew Family Legacy Continues

Because Henry "Hank" Loew believed the value of higher education was priceless, an endowed scholarship to support electrical engineering undergraduate students with financial need was established by his family.

The Loew family legacy at the University of Washington dates back to 1909, when Hank's father, Edgar Loew (the namesake of Loew Hall), joined the Electrical Engineering Department. Edgar was a researcher, lecturer, professor and dean at the University for more than 40 years.

Hank graduated from the University of Washington along with his two brothers. Earning a bachelor's degree in electrical engineering in 1937, Hank went on to have a 44-year career at GE in management and sales.

Hank passed away in 2013 and the scholarship was established by his children and grandchildren in recognition of his commitment to learning and to the University of Washington. An endowment signing celebration for the Henry R. Loew Endowed Scholarship in Electrical Engineering was held on May 2, 2014, attended by the Loew family. The scholarship benefits electrical engineering undergraduate students specifically with a focus on financial need.



Above:  
The Loew Family  
at the endowment  
scholarship signing  
celebration in May  
2014.

Left:  
Henry "Hank" R.  
Loew.

## Women Engineers

(Continued from page 4)

### Support Women in Engineering Contribute to Irene Peden's Legacy

Thanks to the generosity of Professor Emerita Irene Peden, the first woman faculty member hired in UW EE in the 60s, fundraising is underway for an endowed fellowship to support young women in the field of electrical engineering. Almost 90 years old, Peden invites you to join her in funding the fellowship with a 1:1 matching incentive. With a goal of raising \$250,000, close to \$189,000 has already been raised. Your help is needed to make it a reality!

Among many accomplishments, Peden is one of few faculty in the history of UW EE to be inducted into the National Academy of Engineering. Her pioneering efforts brought equal pay issues to the forefront and inspired many women to join UW EE.

*To make a gift, please contact Mahnaz Sherzoi, Director of Advancement, at 206-685-1927 or [mahnaz@uw.edu](mailto:mahnaz@uw.edu).*



Jessica Tran, who graduated with a Ph.D. in June 2014, attended the conference the past two years. As a first time attendee, she presented her dissertation research and attended the career fair, where she connected with her present employer, Thomson Reuters.

"I walked away from the career fair with multiple job interviews and landed a job as a Technology Associate Leader," Tran said.

At this year's conference, Tran had a different role: she spoke to attendees about internships and positions at the company.



# EE on the Road

## San Francisco, September 2014

Every year, UW EE staff and faculty hit the road to visit alumni throughout the U.S. and abroad. Celebrating UW EE pride, the following alumni were visited in the Bay Area.



Robert Bathiany, BSEE 1967 and MSEE 1969, and his wife Mara. Robert had a dynamic career in radio frequency and microwave. Enjoying retirement, they keep busy traveling and sailing.



Fred Anderson, BSEE 1968, is a huge Husky sports fan and had a long career at Lockheed Martin. In retirement he enjoys spending time with family and volunteering at the Pacific Stroke Association.



Kelly Williams (EE Advancement) and Don Chinn, BSEE 1963. Don had a long career at Lockheed Martin and is currently retired. He enjoys spending time with his family, traveling and volunteering at the Sunnyvale Senior Center computer lab.

## Alumni Spotlight



Tom Rolander (MSEE 1976) kneels next to an IEEE "Milestones in Electrical Engineering and Computing" plaque in Pacific Grove, CA. The plaque honors UW CSE Ph.D. alum Gary Kildall. Rolander met Kildall while studying at UW EE and later joined Kildall at Digital Research, which created one of the first operating systems that made computers more affordable. The two went on to form additional companies together. Last year, Rolander was honored with the College of Engineering's 2013 Diamond Award for Entrepreneurial Excellence.

## New Combined Bachelor's and Master's Degree Program

It's never too early to start thinking about an advanced education, especially now with the new combined UW EE Bachelor's and Master's Degree Program.

Available to UW undergraduates and undergraduates from select overseas partner institutions, the program offers early admission into the graduate program, with increased efficiency, continuity and prestige. The combined degree program is offered to highly qualified undergraduates who have completed their junior year. Students are expected to start their graduate studies in the following autumn quarter, after completing their bachelor's degree.

To apply, students must have a minimum 3.7 GPA, two letters of nomination from EE faculty, a written statement of purpose that includes a description of the intended thesis or project direction and TOEFL scores for non-native English speakers.





John Sahr  
Professor & Interim Chair

Jenq-Neng Hwang  
Associate Chair for Research

R. Bruce Darling  
Associate Chair for Education

Lih Lin  
Associate Chair for Advancement

Brooke Fisher  
Public Information Specialist

Contributors  
Mahnaz Sherzoi  
Kelly Williams

Send address corrections to:  
[alumni\\_relations@ee.washington.edu](mailto:alumni_relations@ee.washington.edu)



University Of Washington  
Department of Electrical Engineering  
Paul G. Allen Center - Room AE 100R  
Box 352500  
Seattle, Washington 98195-2500

## UW EE CarEEr Fair and Casino Night Looking to Hire Outstanding Graduates?

Join us for the third annual UW EE Career Fair and Casino Night to connect with students! In addition to a table at the Career Fair, participating companies will have access to EE's student resume book and the opportunity to post jobs and set-up on-campus interviews.

Tuesday, January 20, 2015  
Career Fair: 1-4pm, HUB Lyceum  
Casino Night: 5:30-8:30pm, Walker-Ames Room

Following the Career Fair, the student society IEEE-HKN will host Casino Night, which has attracted hundreds of students in past years. The fun, interactive event provides industry representatives an opportunity to talk with students about their goals and interests.



Register:

Please email [events@ee.washington.edu](mailto:events@ee.washington.edu)