

# THE INTEGRATOR

2019



## **DAWN OF A NEW ERA**

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HOW THE NAME  
CHANGE REFLECTS  
WHO WE ARE AND  
WHAT WE DO





# SNAPSHOTS

## TABLE OF CONTENTS

Letter from the Chair	4
Name Change Celebration	5
Hill-crest Celebration	9
Bay Area Mixer	10
2018 Graduation	11
Class of 1968	14
Keith Rattie	17
Marnie Mar	18
2018 ENGINE	19
11th Annual Lytle Lecture	20
ECE Spotlights	21
Memorials	25
Sal Dhanani	26

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Rebekka Coakley, Public Information Specialist  
Rylie Sweem, Publications Student

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# /// CHAIR'S LETTER

*Dear Alumni & Friends,*

It has been a truly exciting year in our department. On September 16th 2018, we officially became the Department of Electrical and Computer Engineering (ECE). The new name correctly reflects the fact that a major portion of our faculty's research and our students' learning has been in the area of hardware driven computer engineering. The name ECE opens up opportunities for our students around the Pacific Northwest innovation ecosystem, and provides us with enhanced capabilities for recruiting from a much larger pool of new faculty and students. Simply put, it is the dawn of a new era for the UW ECE community.

This name change has been thirty years in the making. Our past department chairs and their leadership laid the foundation for it and in the past couple of years, we were able to get unanimous support from our faculty, students, industry partners and community stakeholders. Working hand-in-hand with UW leadership and the leadership of the Paul G. Allen School of Computer Science and Engineering, our long-term dream became reality.

This issue of the Integrator is mainly dedicated to sharing the celebration of three events we held to commemorate this change. The first hosted by UW President Couce at the Don James Center; the second hosted at the official residence of President Couce; and the third with our alumni in the Bay Area.

This issue of the Integrator also covers our 2018 commencement, featuring our alum Sal Dhanani who is an inspiration to all of our fresh graduates. Sal's journey to entrepreneurship is a page out of Silicon Valley dreams becoming reality. We were also delighted to have our regent Jeremy Jaech join us to celebrate his nephew Aaron Jaech graduating with a doctoral degree. Both Sal and Jeremy reminded everyone that no matter how high one flies in the professional world, our families keep us grounded and remind us where home is. At ECE, we strive to provide an intellectual home for our students.

Our alum Keith Rattie and his wife Nancy continue to grow their endowment for Clean Energy in ECE. Finally, at the Bay area

meeting, I was delighted to hear that Marnie Mar was recognized as the top performing account manager at her company.

As we move forward to fulfill the promise of the name change, I call upon all of our alumni to connect with UW ECE. There are so many different ways to support ECE's students, faculty and programs, especially in this exciting time of growth. No matter what kind of support excites you, I urge you to talk to us and engage. Whether your company sponsors a senior ENGINE Capstone Project, or you share your expertise with our students by serving as a speaker in our seminar series, or you donate to the Excellence in ECE Fund, it is a great time to become further engaged. Giving back ensures the next generation of students continue to thrive. Thank you for being a part of this change and for being a part of the future of the UW ECE community.

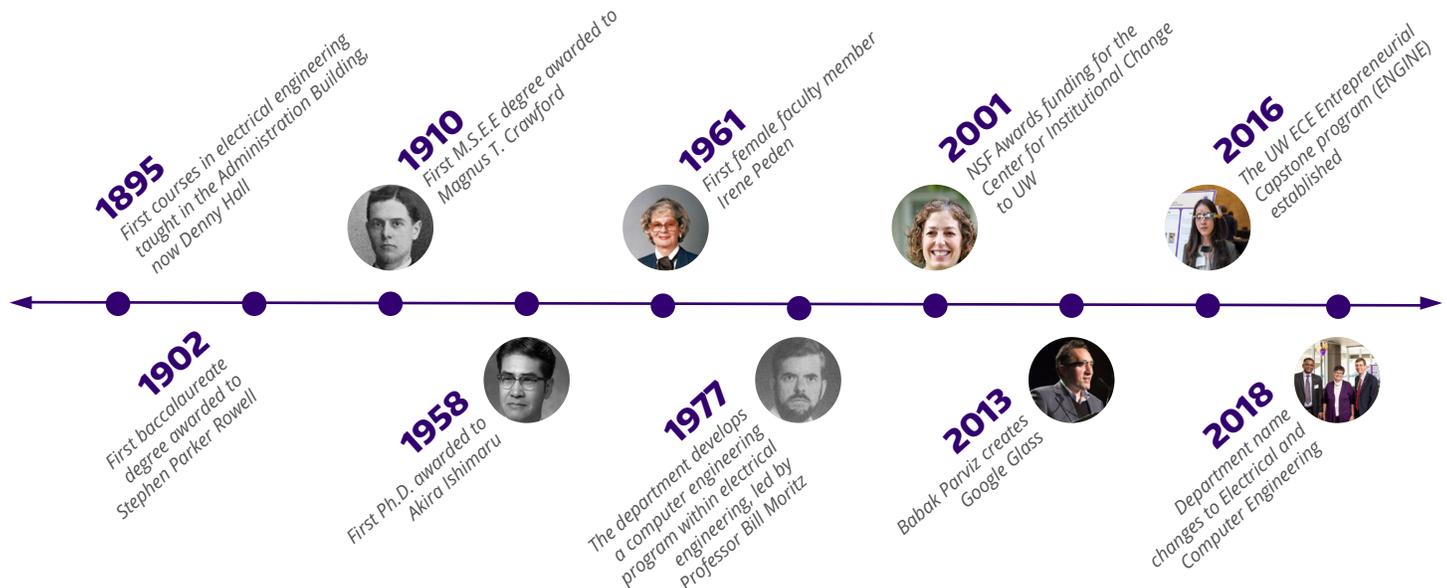


*P. Pooventran*

**RADHA POOVENDRAN**

PROFESSOR AND CHAIR  
ELECTRICAL & COMPUTER ENGINEERING

# /// DEPARTMENT HISTORY



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# CELEBRATING OUR NEW NAME

*We recently celebrated our name change with alumni, university leaders, industry advisors, students, faculty and staff at the Don James Center on campus.*

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## CELEBRATING THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING



### **ELDRIDGE ALCANTARA**

ECE DOCTORAL CANDIDATE

"The way we as students describe what we do and where we are from is important. This name change sends the message loud and clear that we as students and our futures matter, so thank you to our department and University for recognizing that."



### **MARI OSTENDORF**

ECE PROFESSOR

"The name change is really an exciting development that I think will be important for students, both in terms of understanding what they'll be studying, but also in reflecting what they've learned once they graduate."



### **RICO MALVAR**

DISTINGUISHED ENGINEER AND CHIEF SCIENTIST, MICROSOFT RESEARCH

"We are inspired by the work being done at UW ECE. The name change adds a little more emphasis on computing and adds a little more visibility that UW is already doing lots of good things in computer engineering as a subject, both from ECE and from the CSE department."



### **RADHA POOVENDRAN**

PROFESSOR AND CHAIR OF ELECTRICAL & COMPUTER ENGINEERING

"ECE appropriately recognizes the heart of this department and stands for the students and their future. Our department cultivates innovation and inspires through high-impact research. We are truly enriching and improving lives by addressing complex challenges in health, energy, technology and the environment."



## **BABAK PARVIZ**

VICE PRESIDENT, AMAZON

"This is a department that is looking into large problems that impact our society, it's innovative, it is trying to create new things, and it is full of people that mean to make this world a better place."



## **MICHAEL BRAGG**

FRANK AND JULIE JUNGERS DEAN OF ENGINEERING

"In the College we are continually focused on improving our student experience, and this name change is another step to enhance the student experience. I believe this change will raise the visibility of this excellent department."



## **ANA MARI CAUCE**

PRESIDENT OF THE UNIVERSITY OF WASHINGTON

"Innovation is at the heart of ECE, which has been a leader in advancing some of the UW's most exciting initiatives. Today we celebrate the Department of Electrical and Computer Engineering and its impact on our students and on the world they will explore and create."



## **EMILY PARRY**

ECE UNDERGRADUATE

"Intelligent computing devices are a significant part of electrical engineering's present and future. I am grateful that the department and university leadership care enough about my future to change our name and show the world all of what I am learning here."

## ELECTRICAL ENGINEERING CELEBRATES NEW NAME:

# A NEW ERA BEGINS

*UW Electrical Engineering has changed its name to the Department of Electrical & Computer Engineering (ECE) to expand student opportunities and better reflect current teaching, research and service.*

**T**he department's new name — which went into effect on September 16, 2018 — has been widely endorsed by university and college leadership, faculty, students, staff, alumni, advisors and industry leaders.

"This is an exciting development for our engineering community. The UW is known for our interdisciplinary environment and the Department of Electrical Engineering and the Paul G. Allen School of Computer Science & Engineering have a long history of innovation and collaboration. Much of our strength in computer engineering comes from that expertise — at the intersection of computer science and electrical engineering," says Michael B. Bragg, the Frank & Julie Jungers Dean of Engineering.

The new name more accurately reflects the department's research focus and student interest in embedded systems and other hardware digital systems. It also better highlights the close connection between electrical and computer engineering in research and industry.

Current industry jobs and entrepreneurial opportunities in hardware-driven computing domains are vast and it is anticipated that this shift will open more opportunities for our students and alumni.

The name change will not impact the degrees granted. The ECE department will retain its degree program in Electrical

Engineering, and the Allen School will retain its degree program in Computer Engineering as well as its degree program in Computer Science.

"There is an industry need for electrical engineers that also have a computing background because devices are becoming smarter," said Rico Malvar, chief scientist for Microsoft Research and ECE affiliate professor. "Computing is in everything we do today, including electrical engineering."

Much of the UW's strength in computer engineering arises from faculty — including Shwetak Patel, Joshua Smith, Michael Taylor, Georg Seelig and Linda Shapiro — who are jointly appointed in ECE and the Allen School. These faculty members lead notable research programs such as the Ubicomp Lab, the Sensor Systems Laboratory and the Seelig Lab of Synthetic Biology.

"These top caliber faculty attract sought-after graduate students, which feeds the cycle of excellence, and we believe our new name will only strengthen such recruitment efforts," says Radha Poovendran, professor and chair of ECE. "The field of electrical and computer engineering has produced inventions that have changed the world and the way we live. As our department begins a new era, the opportunities for impact are endless." ■



*A special thanks to Chelsea Yates for this story.*

# CELEBRATING AT HILL-CREST

*University of Washington President Ana Mari Cauce hosted distinguished alumni, faculty, and ECE friends at her home to celebrate our new name.*



*Top left: President addressing crowd. Top right: Steve Perrin, Marilyn Stone Lytle, Mahnaz Sherzoi. Middle left: Dean of Engineering, Michael Bragg, ECE Chair, Radha Poovendran, UW President, Ana Mari Cauce, CEO of Guardian Security, Frank Close, UW alum, Marilyn O'Neil, Vice President of Innovation Strategy, Vikram Jandhyala. Middle right: UW Provost, Mark Richards, Microsoft VP Julia Liuson, EE alum, Lowell Skoog. Bottom left: CEO of Guardian Security, Frank Close, CEO of Wood Harbinger, Tom Leonidas. Bottom right: Dean of Engineering, Michael Bragg, ECE Chair, Radha Poovendran, Pam Kummert and her husband, Venture Partner at Madrona, Ted Kummert, UW President, Ana Mari Cauce, Vice President of Innovation Strategy, Vikram Jandhyala.*

# BAY AREA ALUMNI MIXER

In October, the Department of Electrical and Computer Engineering hosted an alumni mixer at the Computer History Museum in the Bay Area.

**See more online!**

Head to our Flickr page for even more photos from the 2018 alumni mixer.  
[flickr.com/photos/uwecenews/](https://www.flickr.com/photos/uwecenews/)



Top photo: ECE Professor Chris Rudell addresses alums. Middle left: Keyu Chen, Pei-An Lee and Tong Zhang. Middle right: Jane Huynh, Sam Huynh and Angelica Huynh. Bottom left: Siri Weerasooriya, Thomas Rowland, Jessie Muhm. Bottom right: Radha Poovendran, Jovanka Ciric Vujkovic and Miki Vujkovic.

**The Bay Area Mixer was hosted by Radha Poovendran, with faculty guests Payman Arabshahi, Chris Rudell, Matt Reynolds, and John Sahr.**

## **STAY UP TO DATE ON FUTURE EVENTS!**

Please visit our alum engagement page for future event announcements and quarterly lab tour dates.

[ece.uw.edu/engage/alumni/get-involved/](https://ece.uw.edu/engage/alumni/get-involved/)



## THE CLASS OF 2018

*University of Washington and ECE alum Sal Dhanani spoke at this year's graduation ceremony.*





## LOOKING FORWARD, REFLECTING BACK

**A**s a young child, Sal Dhanani would take things apart, then attempt to put them together again.

“My mom always tells me that when I was younger, my dad would get mad because he would buy a new watch and I would take it apart to see how it works,” the University of Washington (BSEE ‘96) alumnus said. “When I was a kid, I would buy these electronic kits like you find at Radio Shack, and solder, hack and tweak the contents to create something new. I was born an electrical engineer, I think.”

As he got older, the opportunities to work on more complicated engineering projects were provided in school. His high school, Bellevue High, let him experiment in hardware and software.

“We put together solar powered model cars and raced them to see who would win,” Dhanani said. “It was really so much fun, I liked the feel of machining it and putting it together. We did everything, we built it all, including the software. We had full control over it all, not just one part of it.”

Attending the University of Washington and earning a bachelor’s degree in electrical engineering seemed like the natural next step in building a career path that began back when he first started taking things apart to see how they worked.

As a student at the UW, Dhanani embraced lessons he learned from his professors. His systems design methodologies professor, Mani Soma, showed him how important it was to be level-headed, something he tries to do today. Soma was also the advisor for the UW student chapter of the Institute of Electrical and Electronics Engineers, which Dhanani was president of during his senior year.

“I learned a lot about leadership and how to effectively communicate with people in a professional way from Mani,” Dhanani said. “And professor William Moritz taught me the



*Professor and Chair of ECE Radha Poovendran and Sal Dhanani.*

importance of setting the bar high and to strive for perfection, they both taught me so many things that are still memorable to me even now.”

These valuable lessons have helped serve Dhanani well, as co-founder and co-president of Telenav, a connected car and location-based services company. They pioneered GPS navigation on cell phones in 2003 and over the years have, “paved the way for a bigger end-to-end mobility transformation for all people on the go – starting with connected car solutions for drivers,” as stated on their website.

Even though it’s been 22 years since Dhanani moved his graduation tassel from right to left as he walked across the stage, the department and the people in it still mean a lot to him. Which is why, when asked to give the 2018 commencement address, Dhanani didn’t hesitate.

“The department has done a lot for me, changed my life in a big way, it was so simple to do this for them,” he said.

It was his way of giving back to the students and the department.

“Sal has established himself as a leader in industry,” said Professor and Chair of Electrical and Computer Engineering, Radha Poovendran. “With years of success in product

marketing, product management, business strategy and operations, I am grateful that the department still means so much to him that he was willing to return to teach our newest graduates lessons he learned while working in industry.”

While considering the wisdom he would pass on to the Class of 2018, Dhanani said he thought about what he would have wanted to know at the beginning of his career. He spoke of the future, and made suggestions about working hard and staying focused in the next few months and next few years after college.

“But something I didn’t talk about and have been thinking about since, is what helped me get to where I am today,” Dhanani said. “A big part of who I am today is my parents. They have had a huge impact on my values, my goals and my career.”

Dhanani said his parents instilled in him a drive and passion to make the most positive impact on humanity, and to measure success by how many people he has helped.

“While I spoke about the future, I also should have spoken about the past, my parents, because they were great role models for me and to this day, every day I try to emulate them.” ■

“The department has done a lot for me, changed my life in a big way, it was so simple to do this for them.”



ECE spring commencement.

Douglas Guyman	Kenneth Fenander	Jack Miller
Gary Swofford	Kerry Forschler	Robert Miller
Louis Anderson	Harry Gardner	Earl Mills
Thomas Jones	Meletios Geokezas	David Nichol
James Lin	Terry Glude	David Nordstrand
Patrick O'Keefe	James Grant	John Parshall
James Preble	Donald Greenlaw	Burton Pierard
Ward Helms	Harold Hagen	George Prentiss
James Holmes	John Hare	James Pressnall
Francis Spelman	Gary Harkins	Wayne Quilitz
Thomas Campbell	Kenneth Hentges	Jack Richardson
W. Adrianse	Robert Husby	Scott Richmond
Dennis Anderson	Bert Iwanaka	Glenn Robinson
Bruce Baker	Robert Jodry	James Robinson
Dean Ballou	Walter Kelly	Richard Rothrock
Michael Berge	Gordon Kirk	Afrem Shdo
David Boughner	Lawrence Knutsen	Peter Shreve
Russell Carstensen	Donald Kretz	Henry Singer
Harry Chesser	John Linn	Thomas Skarshaug
Rexford Clark	Frank Mauger	Thomas Steury
Donald Cramsey	Wayne McElroy	Michael Stimac
Michael DeWalt	Paul McManus	Paul Stoll
Dexter Eng	Jackson McNees	Kenneth Takeuchi
Michael Fabre	David Miller	Dimitry Tihomirov



# LASS OF

# 1968

Loyd Walker

Ralph Walter

William Walters

Jack Williams

Kenneth Williams

James Wilson

Allan Wing

Gary Wong

James Yee

Kenneth Yoshida

Horst Zimmer

## Celebrating 50 years

The rapid evolution of electrical & computer engineering keeps the department focused on the future, but it's the department's robust history of creativity, innovation and impactful research that got us here.

Fifty years ago, in 1968, Daniel G. Dow became the third chair of electrical engineering at the University of Washington. At the time, the electromagnetics research program was burgeoning and a lot of the department's research funding was based around antenna design and testing. And, 84 of the department's finest, became UWEE graduates, the class of 1968.

On June 6 of this year, the department celebrated these alums and all that they have accomplished in their lives and careers since leaving the University. Ward Helms, Tom Jones, John Linn, Jack McNees, Jack Miller, Tom Skarshaug and James Wilson attended the department's commencement ceremony and were honored for their work as engineers and for the mentorship of engineers following in their footsteps.

Ward Helms graduated with a Ph.D. and then joined the faculty of the Department of Electrical Engineering. He taught electronics for 38 years and carried out research on ionospheric radio wave propagation and analog integrated circuits. Helms now lives on the shores of Camano Island and is very active in amateur radio with an emphasis on linear satellites.

Tom Jones completed his bachelor's degree and after graduating he worked as a professional engineer in the power field for over 45 years. During his tenure he had the opportunity to see many parts of the country and the world which included 10 years overseas.

John Linn graduated with his bachelor's and then attended graduate school at Stanford University where he studied computer architecture. After receiving his Ph.D. in 1973 he joined Texas Instruments in Dallas Texas and contributed to or managed



*Graduates of the Class of 1968 sit wearing their stoles with UW ECE faculty.*

numerous research and development organizations throughout the company. At his retirement in 2006, he was director of systems and software in semiconductor R&D.

Jack McNees completed his bachelor's degree, worked for two years as an electrical engineer and then converted over to computer process control for 20 years. Following his master's degree in computer science, he eventually did Advanced Business Application Programming (ABAP) in the systems, applications and product environments. Married for 56 years, he and his wife, Penny enjoy the company of their four children, 11 grandchildren, and seeing the world.

Jack Miller graduated with his bachelor's degree and had a 33-year career at the University of Washington Applied Physics Laboratory where he developed instruments for oceanographic research and was a co-principal investigator on cruises in oceans around the world.

Tom Skarshaug completed his bachelor's degree and used the fundamentals of his engineering background every day, including in practicing dentistry for 42 years. Most recently he has been writing books of personal empowerment—the latest is about preventing cancer and heart

disease with an empowered state of mind.

James Wilson graduated with his bachelor's degree, then went to work for IBM designing automated test equipment. After 30 years, he retired, worked independently for two years and then went back to IBM for seven and a half more years. He is now fully retired and spending more of his time with his children, grandchildren and traveling.

While these are just a few stories from the class of 1968, they exemplify the innovation that has always been a part of this department. ■



*Class of 1968 stand while they are recognized during the 2018 spring commencement.*

# GIVING BACK

## KEITH AND NANCY RATTIE SCALE UP THEIR CLEAN ENERGY ENDOWMENT IN ECE

**T**he so-called American energy renaissance may be the most underappreciated story in American business, according to Keith Rattie (BSEE '76).

The retired chairman and CEO of Questar Corp, began his career in the oil and gas industry after graduating from the University of Washington. Since the time of his graduation, until a few years ago, the world feared its energy resources would one day be gone.

"The prevailing wisdom back then was that the world was running out of oil and gas," Rattie said. "But thanks to advances in technologies, we now live in an era of energy abundance. Simply put, planet earth's oil and gas resources are vast."

He said that now that we don't have to worry about 'running out' of those energy resources, researchers can shift their focus.

"The challenge for decades to come will be meeting mankind's insatiable appetite for energy while reducing the impacts of energy on the environment," Rattie said. "That's why it's important to me to support the Department of Electrical and Computer Engineering. Breakthroughs in energy originate in the minds of engineers."

Continuing to aid the department that helped him secure his career in the energy industry, Rattie has added



*Keith Rattie (BSEE '76) and his wife Nancy, continue to support the ECE department with their full professorship endowment in power and energy systems.*



*ECE professor and chair Radha Poovendran, professor Baosen Zhang, and Rattie (left), Rattie and former ECE chair Daniel Dow (right).*

to his already generous donation to ECE, endowing a full professorship to faculty based in power and energy systems.

"Giving back to the UW and the ECE department in particular, is my way of saying thanks," he said.

Baosen Zhang, the Keith and Nancy Rattie Endowed Career Development Professor, said that Rattie is always thinking about the future of energy security and works to ensure that the world will always have cheap and reliable power as technology and society continue to change and grow.

"This endowed professorship has helped me tremendously in my research to make power systems more efficient and more sustainable," Zhang said. "Keith Rattie has always worked toward ensuring economical and reliable supply of energy and through this endowment, he enables our students to freely explore new and innovative ways to achieve this goal."

Rattie stresses that modern life would not be possible without abundant and growing supplies of affordable energy.

"Energy use and prosperity go hand-in hand," he said. "The two are inseparable. There may be no greater challenge facing mankind today than figuring out how we are going to meet the energy needs of a planet that may have nine billion people on it by 2055." ■

# CHANGING CAREERS

Alum Marnie Mar's journey to becoming the **top performing account manager** at Global Foundries, began in electrical engineering.



Marnie Mar

**A**s a self-described math and science person in high school, Marnie Mar (BSEE '81, MBA '83) knew she wanted to someday work in technology. She chose to get her bachelor's degree in electrical engineering and her MBA at the University of Washington, then focused on building a career that spanned engineering and sales roles at Eldec, Hitachi, Ltd. and IBM.

As the director of sales, ASIC, she works with custom semiconductor developers who design leading edge networking and machine learning solutions. Last year she became the Top Performing Account Manager at Global Foundries, a semiconductor manufacturing and design company.

"I started out working in engineering positions, and realized that the sales people bringing us new technology solutions were the ones that were going out to lunch, driving around in company cars and talking to customers about the exciting things they were working on," she said. "To me, that had a lot of appeal."

Mar said that she wanted to talk more and learn about a range of technologies, more than working on a small piece of it. Her technical positions led to sales and sales management positions. Mar's background in the technical field gave her an advantage to her career in technical sales. She said it has made it easier to understand the challenges her customers face and create successful customer relationships.

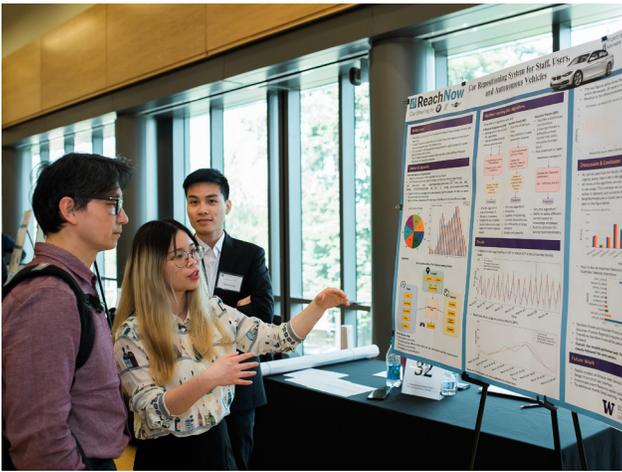
Mar said that becoming the top performing account manager was a lot of work but she appreciated the

recognition amongst her peers for her drive and dedication to her customers and their needs.

"It's exciting for us to see where our alumni go and what they do once they have finished their education," said Professor and Chair of Electrical & Computer Engineering, Radha Poovendran. "Marnie built a career in a field that she was trained in, that also complemented her interest in working with people and sharing her knowledge."

This year Mar is focusing a little more on a good work-life balance after earning such an important recognition in 2017. She is excited about her alma mater's name change to the Department of Electrical & Computer Engineering and hopes to give back to the department by serving on the board. ■





# 2018 ENGINE FAIR

Our annual Engineering Entrepreneurial Capstone Program (ENGINE) was a huge success, with nearly 40 student groups presenting in research areas such as digital signal processing, computer systems architecture and robotics. This year's industry award winners were students Ishan Sarma, Jeffrey Chrisope and Rachel Kominek (right) who formed the OceanLens ROV Underwater Recharging and Data Transfer team. Working under the guidance of faculty advisor Howard Chizeck, they designed, built and tested a system for wireless underwater charging and data transfer for a remotely operated underwater vehicle, including an autonomous self-docking module.



# THE 11TH ANNUAL LYTLE LECTURE



The Dean W. Lytle Electrical & Computer Engineering Endowed Lecture Series is the department's premiere annual event, featuring internationally renowned researchers in the field of communications and signal processing. This year's featured lecturer was Claire Tomlin, the Charles A. Desoer Chair in the College of Engineering and professor in electrical engineering and computer science at the University of California, Berkeley. Tomlin spoke about "Safe Learning in Robotics." The Lecture Series was made possible by an endowment from the Lytle family in honor of ECE Professor Dean W. Lytle.



“  
I have always been interested in safety of autonomous systems, and these learning-based systems present new challenges in terms of showing that such systems are safe. This has been a main direction of recent research in my group.”  
”

# ECE SPOTLIGHTS

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## Arka Majumdar wins Sloan Fellowship

Arka Majumdar, assistant professor of electrical & computer engineering and of physics, has been awarded an early-career fellowship from the Alfred P Sloan Foundation. The Sloan fellowships honor early-career researchers whose achievements mark them as the next generation of scientific leaders.



## Ostendorf wins Flannagan award

Mari Ostendorf, ECE professor, won the 2018 IEEE James L Flannagan Speech and Audio Processing Award for her innovative research in speech and language processing and improving language technology.



## Eve Riskin honored by ECEDHA with Diversity Award

Eve Riskin, professor of electrical & computer engineering and associate dean of diversity and access in the College of Engineering, has been a champion of diversity and inclusion at the University of Washington. In recognition of her efforts, Riskin was honored with the 2017 Diversity Award by the Electrical and Computer Engineering Department Heads Association.



## Johnson's DOE grant will lead us to a better future

The U.S. Department of Energy (DOE) has pledged \$2.84M to a research team led by University of Washington electrical & computer engineering professor Brian B. Johnson to lower the cost of power electronics in solar photovoltaic (PV) systems. The DOE's long-term goal is to cut the cost of solar PV systems in half by 2030, down to \$0.03/kWh over the lifetime of a system. The multi-institutional team includes UW ECE professor Daniel Kirschen, leading experts from the University of Colorado Boulder, the National Renewable Energy Laboratory, and semiconductor manufacturer Wolfspeed.

Over a period of three years, Johnson's team will develop ultra-low-cost electronics that convert direct current (DC) power from PV arrays into grid-compatible alternating current (AC) power. Unlike conventional DC-to-AC inverters used today which require a bulky and costly transformer to step up the low voltage that they produce, the proposed architecture is able to produce voltages up to the tens of thousands of volts using only electronics.



### UW Team wins international Amazon Alexa Prize for the design of conversational AI

A team of researchers led by ECE professor Mari Ostendorf won Amazon's international Alexa Prize. The UW team developed Sounding Board, a conversational agent designed to interact with users with engaging and informative conversation and transform how people interact with information. The Alexa Prize is a \$2.5 million university competition designed to encourage the development of conversational artificial intelligence. \$500,000 went to the UW team.



### ECE hosts Global Electrical Engineering Program

Students from four different universities in China spent six weeks advancing their ECE knowledge at the University of Washington. Students created hands-on projects in the department's labs, studied in our classrooms with ECE professors and toured the city visiting local companies and important landmarks. This was the fourth year for the program, which has been growing each year.



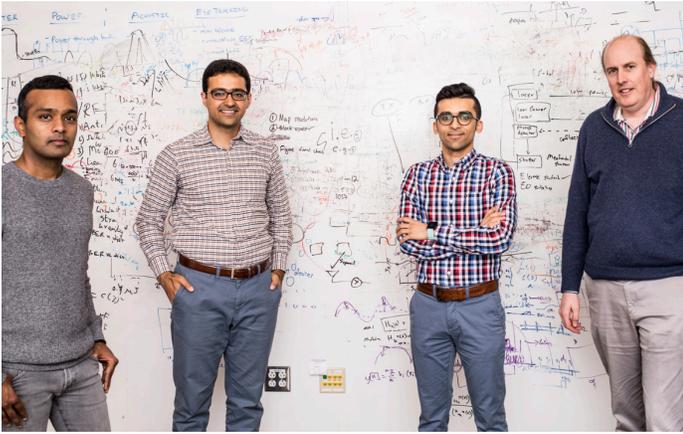
### The UW Electrical & Computer Engineering Entrepreneurial Capstone program (ENGINE)

ENGINE, the Engineering Entrepreneurial Capstone program, was created to enable students to work in teams on industry sponsored projects. Developed in 2015 as the first entrepreneurial system design course of its kind in the department, the option is designed to develop students' skills in innovation, systems engineering and project management. In 2019, the program will join the College of Engineering's Capstone program.

### Three students to attend MIT's Rising Stars

Electrical & Computer Engineering graduate students Pan Li, Rajalakshmi Nandakumar and Yuamyam Shi, were invited to attend MIT's Rising Stars academic career workshop for women in EECS. The annual event brings together top women in EECS for research presentations, poster sessions and candid discussions about academic careers.





## Researchers achieve HD video streaming at 10,000 times lower power

Engineers at the University of Washington have developed a new HD video streaming method that doesn't need to be plugged in. Their prototype skips the power-hungry parts and has something else, like a smartphone, process the video instead.

They do this using a technique called backscatter, through which a device can share information by reflecting signals that have been transmitted to it.

The team presented these findings at the 15th USENIX Symposium on Networked Systems Design and Implementation.



## GIX team competes for \$1 million XPRIZE for women's safety

UW students have developed an inconspicuous wearable emergency notification device about the size of a half dollar. The device monitors physiological signals and allows the person wearing it to trigger an alert for help, even if the user is physically restrained. The team uses machine learning to process the signals produced by the user. Although small, their device has big potential.

"Through technological innovations, we can make meaningful improvements to women's safety that leads to lasting impact over time. We hope to contribute to making the world a safer place for women and communities around the world," said the team leader, Nicholas Becker, a UW ECE doctoral student and GIX dual-degree student.



## Katherine Pratt - TechCongress

ECE Ph.D. candidate Katherine Pratt joined TechCongress in Washington, D.C. this year to share her technical expertise with policymakers, who until recently, in some cases, were describing the internet as 'a series of tubes.' TechCongress strives to bridge the knowledge divide between D.C. and Silicon Valley, and create better outcomes for both.



## UW Hyperloop Team Wins Innovation Prize at SpaceX Competition

UW ECE students helped propel the UW Hyperloop Team to an Innovation Prize at SpaceX's Hyperloop Pod Competition at SpaceX headquarters in Hawthorne, California, this summer. This competition is the open-source SpaceX-sponsored vision of CEO Elon Musk to create a new high-speed system of pods traveling in nearly airless tubes underground.



### UW Advanced Robotics Club takes competition to China

The club, led by ECE Professor Blake Hannaford, traveled to Shenzhen, China this summer, where they competed in the RoboMaster competition for a \$75,000 prize. The team placed third in the international competition and plans to return next year.



### Eldridge Alcantara receives Excellence in Teaching Award

ECE Ph.D. student Eldridge Alcantara received a UW Excellence in Teaching Award, for demonstrating extraordinary abilities in the teaching and learning process as a graduate teaching assistant.



### Robofly

Current flying robo-insects are still tethered to the ground. The electronics they need to power and control their wings are too heavy for these miniature robots to carry. Now, engineers, including ECE students, have for the first time cut the cord and added a brain, allowing their RoboFly to take its first independent flaps. This might be one small flap for a robot, but it's one giant leap for robot-kind. RoboFly is slightly heavier than a toothpick and is powered by a laser beam. It uses a tiny onboard circuit that converts the laser energy into enough electricity to operate its wings.



### Ph.D. student Vikram Iyer wins Microsoft fellowship

ECE Ph.D. student Vikram Iyer was one of 10 graduate students from North America selected as a 2018 Microsoft Research Fellow. The Microsoft Research Ph.D. Fellowship program is designed to promote the careers of promising student researchers in computer science, electrical engineering, mathematics, and related fields.

*A special thanks to Sean Harding for helping to collect these spotlights.*



## Remembering Our Friends; Honoring Their Legacies

# MOHAMED EL-SHARKAWI



In October, ECE lost one of its beloved members, emeritus professor Mohamed El-Sharkawi. El-Sharkawi was an ECE professor, associate chair, and a professor in the Clean Energy Institute.

His research focused on electric and renewable energy, electric safety, electric drives, power electronics, intelligent systems and control.

He was an IEEE Fellow and won an International Fulbright Fellow award which allowed him to spend

three months a year for three years, in Morocco, participating in ambitious renewable energy research.

In 2014 he received the IEEE Outstanding Educator Award for the Western United States. He joined the university in 1980 and taught in the department for 35 years.

# JOHN EHRENBERG



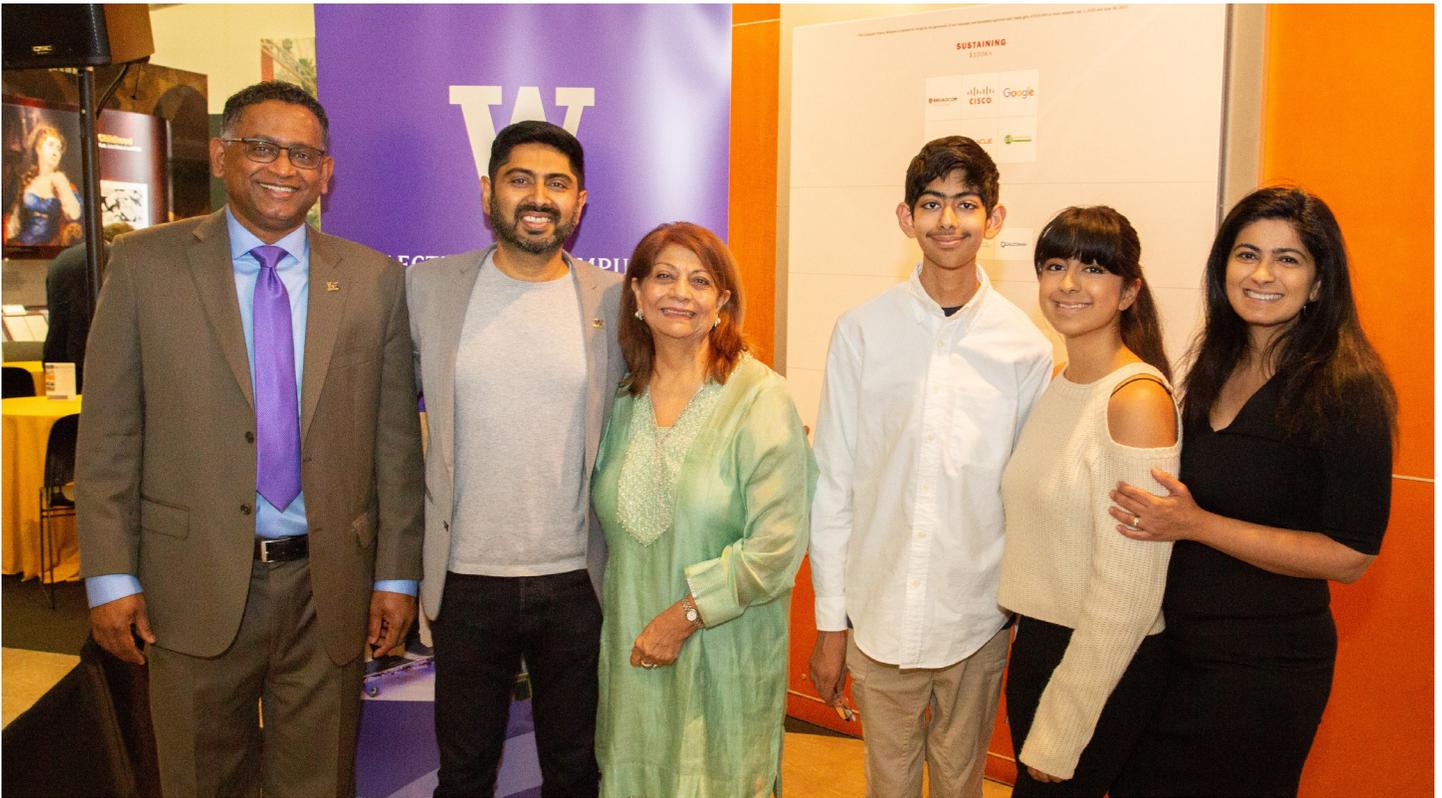
ECE lost friend, faculty and alum, John Ehrenberg, in September. As a graduate student, a research professor and then an affiliate faculty member in the department, he spent 45 years at the University of Washington.

Ehrenberg was a research professor in ECE and at the Applied Physics Laboratory, where he focused on the development of signal processing techniques for underwater acoustic and communications systems and for oceanographic and geophysical instrumentation.

After leaving the University, John

was the director of the Information, Electronics and Avionics Technology organization at Boeing. In 1988, he left Boeing to serve as president and CEO of Seattle-based Hydroacoustic Technology Inc., a company that develops and applies acoustical equipment for remotely monitoring fish populations.

Ehrenberg and his wife Kathleen set up an endowed scholarship in Electrical & Computer Engineering that will support undergraduate students with financial need.



*ECE professor and chair Radha Poovendran, Sal Dhanani and his family.*

## FOLLOWING IN HIS PARENTS' FOOTSTEPS

INSPIRED BY THE COMPASSION AND GENEROSITY OF HIS OWN PARENTS, SAL DHANANI IS WORKING HARD TO CHANGE THE WORLD.

**O**n a road trip more than a decade ago, Sal Dhanani (BSEE '96) was inspired by his pregnant wife's struggle to juggle several maps on her lap as she navigated their journey. Looking for an easier solution for everyone in a similar predicament, he and his company, Telenav, pioneered GPS navigation for mobile phones and changed the way people get from point A to B. Since then the company, which he is co-founder and co-president of, has continued to transform end-to-end mobility transformation.

"I'm proud that we at Telenav invented GPS navigation on phones, and now billions of people use the tools we pioneered," Dhanani said. "We made a positive impact by inventing something that didn't exist in the world, and we still have a lot to do."

Dhanani's to-do list isn't like most. He measures his life by the beneficial contributions he can make to people's lives, which he watched his own parents do every day

while growing up. Most recently, Dhanani's endowed a faculty fellowship to the electrical & computer engineering department at the University of Washington, named after his parents, Afroze and Sherali.

"I am naming the endowment after my parents as a thanks to them for everything they have done for me and inspired me to do; my parents have always given back to others," Dhanani said. "They taught me kindness and empathy and to talk less and do more."

Dhanani's mother is a doctor who joined a non-profit in Pakistan, called Aga Khan Health Services soon after Dhanani was born. She rose through the ranks to lead the organization, which provides healthcare to the poor and people living in very rural areas, reaching them by helicopter or horse, or via whatever means she had.

"She's impacted tens of millions of lives," he said. "Setting up clinics, reducing infant mortality and training others to do the same."

Dhanani's father, who is also an entrepreneur, has always helped people where he can, by helping them get back on their feet, helping them whenever asked.

"He taught me to always work hard not just professionally but in helping others," Dhanani said. "He showed me the importance of having a positive impact on people's lives, by doing it himself."

Dhanani's endowment came about after giving the commencement address in the spring.

"That got me thinking more about how much ECE has done for me and I felt that I had to take the next step because coming back to speak wasn't enough," he said. "I wanted to do more and I still want to do more beyond this."

One of his professors, Mani Soma, said he is not surprised by Dhanani's gift to the department.

"Sal was a very dedicated and hard-working student, I knew he would do well no matter which job he chose," Soma said. "He clearly has a strong focus on education and supporting education."

"I wanted to do more and I still want to do more beyond this."

Dhanani, who learned a lot from from Soma, said he chose to bestow a faculty fellowship to the department because it's where the knowledge and greatness in the department happen—the mission is fulfilled through faculty, who execute it then pass it onto their students.

"As professors, they have a gift that keeps on giving," he said. "The endowment will then have an even bigger impact." ■



*Dhanani and his wife and children (top), his mom Alfroze, children and father Sherali (middle), UW Assistant Director of Advancement Kelly Williams, Aynnah, Sal and Alfroze (bottom).*

Paul Allen Center - AE100R  
Campus Box 352500  
Seattle, WA 98195-2500  
206-221-5270  
chair@ece.uw.edu



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### Endorsements

- Paul Merguerian MD, Seattle Children's Hospital
- Kathleen Kieran MD, Seattle Children's Hospital
- Natasha Parman DPT, University of Washington
- Erica Goss, RN BSN CPN, Seattle Children's Hospital

### References

- J.M.S. Lubin and America Bethesda Diabetes & Digestive Institutes of Health

**Radha Poovendran**  
Professor and Chair

**John Sahr**  
Associate Chair for Education and Entrepreneurship

**Mahnaz Sherzoi**  
Director of Advancement, College of Engineering

**Matt Reynolds**  
Associate Chair for Research and Entrepreneurship

**Jenq-Neng Hwang**  
Associate Chair for Global Affairs and International Development

**Rebekka Coakley**  
Public Information Specialist

**Payman Arabshahi**  
Associate Chair for Advancement

Send address updates to:  
[alumni\\_relations@ece.uw.edu](mailto:alumni_relations@ece.uw.edu)

