

CURRENT TRANSMISSIONS

Electrical and Computer Engineering | Missouri S&T | Spring 2018

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BACK

FROM THE ASHES

It has been a long road, but the department has nearly fully recovered from the December 2016 fire.

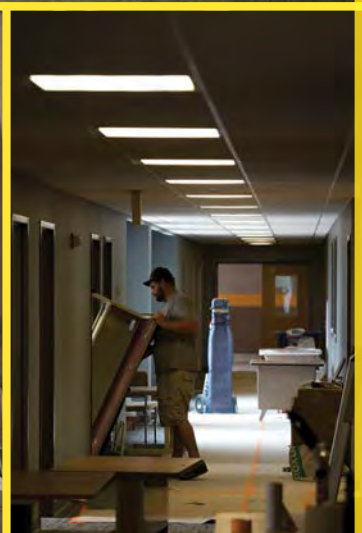
It took a round-the-clock effort over the 2016–17 holiday break to have the west side of the building safe for students by the beginning of the spring 2017 semester, but nearly every classroom and lab was operational in time for classes.

The newer, east side of the building could not be used until all of the carpet and ceiling tiles were replaced, drywall and electrical damage repaired, and the walls repainted.

Since students needed easy access to the secretarial and administrative employees, staff members volunteered to cram together in a “spare” classroom in Emerson until their offices were ready in March. Faculty started to return that same month and were fully back in the building by May. The last of the offices to be repaired, for the department chair and two staffers, were finished by September.

The distance learning classroom and main lecture hall in the east wing, which sustained substantial water damage, were back online by the start of the fall 2017 semester, though some finishing touches had to wait until 2017–18 winter break.

The three rooms that got the worst of the water damage, just beneath the rooftop cooling tower that burned, are just being finished up and should be back in service soon. The good news: the building is looking great, and in many ways, our department is better than ever.



DEAR ALUMNI, COLLEAGUES AND FRIENDS,

To hear my three teenage daughters tell it, age is a bad thing — and I've got far too much of it. I'm older than 30, after all, which means I was born in the time of the dinosaurs, when cavemen suffered without 24-hour access to Google or text messaging.

With age, however, comes wisdom, knowledge and growth. And here at Emerson Electric Hall, 100 years is certainly looking good on ECE during our centennial year.

In 1917, after a hard-won fight with Columbia, the Missouri School of Mines and Metallurgy, our forerunner, awarded its first electrical engineering degree. Since then we've seen thousands of electrical engineering and computer engineering students pass through our halls and go on to great success, making a substantial impact on the community and people around them and building a better world through their work.

Our alumni include a National Academy of Science member who helped enable the invention of the transistor, engineers who were a driving force in the Apollo mission to the moon, astronauts who flew on the space shuttle, entrepreneurs who helped form some of the country's first high-speed optical communication networks, industry titans who built the success of major companies, and technology leaders who created some of the first calculators and electric cars and made modern cinematic special effects possible. And this is just the start. Each of you make me very proud.

Speaking of proud, S&T graduate student and alumna **Katie Brinker**, CpE'17, EE'17, won the IEEE-HKN Outstanding Student Award for 2017, making it the second year in a row an S&T student has beat out all other contenders for this international award, and the sixth time an S&T student has won in the award's 52-year history. No other university can match that achievement.

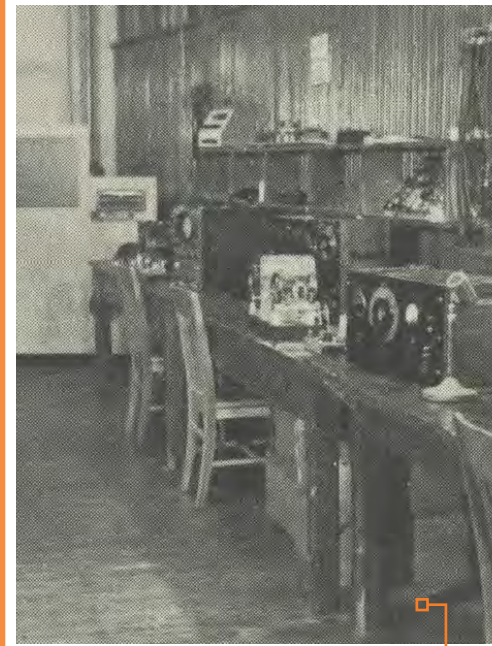


As you might recall, 2017 started off with a "bang" when we had a major fire on the Emerson roof. All of our temporarily displaced faculty and staff are back in the building now, students are again filling our classrooms and labs, and we are nearly fully operational, and in many ways better than ever. A big thank you to all our alumni who contributed to help with the recovery. Your donations made an enormous difference!

Much more has happened than I can fit in this brief introduction, but you can read all about it in the following pages. As always, if you're in Rolla please stop by — I would love to see you!

Warm Regards,

Daryl Beetner, Ph.D.
**Chair, Electrical and
Computer Engineering**



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If you have any updates about yourself or other alumni, or photos or memories to share about the ECE history, please send them to ece@mst.edu.



GRADUATE STUDENT AWARDED TOP IEEE HONOR

Katelyn Brinker is on a roll.

The Missouri S&T graduate student from Highland, Illinois, is co-winner of the 2017 Alton B. Zerby and Carl T. Koerner Outstanding Student Award from IEEE-Eta Kappa Nu (HKN). The honor society for electrical and computer engineers is an affiliate of the Institute of Electrical and Electronics Engineers (IEEE), the world's largest technical professional organization for the advancement of technology.

The award recognizes "outstanding scholastic excellence and high moral character, coupled with demonstrated exemplary service to classmates, university, community and country." She shares the award, which will be presented at a national IEEE/HKN meeting in California in March, with co-winner James Smith of Auburn University.

Brinker, CpE'17, EE'17, was also named to the IEEE-USA New Faces of Engineering, College Edition.

"Katie exemplifies the Missouri S&T work ethic," says **Steve E. Watkins**, professor of electrical engineering and computer engineering, adviser to the university's HKN chapter and the international organization's president. "She also demonstrates HKN's membership ideal, with a professional balance of academic excellence, leadership accomplishments and volunteer effort."

Growing up in Highland, 30 miles east of St. Louis, Brinker learned about engineering from her father, who is also an electrical engineer, and from Project Lead the Way courses in high school.

Brinker was also a member of the university's Mars Rover Design Team, which in June 2017 won the annual University Rover Challenge, an international competition. And as an intern with the Southwest Research Institute, she helped write software that will be aboard the European Space Agency's mission to explore Jupiter's moons.

In grad school, Brinker has received a NASA Space Technology Research Fellowship to work as a graduate research assistant with **Reza Zoughi**, the Schlumberger Distinguished Professor of Electrical and Computer Engineering and director of the Applied Microwave Nondestructive Laboratory.

Brinker has worked part time as an undergraduate research assistant with Zoughi since August 2015. There, she uses the lab's microwave testing equipment to analyze materials for a variety of projects, from determining the porosity of clay pots used to filter water in Guatemala to studying simulated skin — made of agar, water and gelatin — for a Ph.D. candidate's research on microwave imaging of severe burns.

For her capstone senior project, Brinker and fellow undergraduate researchers **Matt Dvorsky**, **Cody Edwards** and **John Gallion** developed a microwave imaging system that could be flown on unmanned aerial vehicles to inspect aging infrastructure that is difficult to monitor from the ground — such as the tops or sides of bridges. This work will continue as one of the research areas of Missouri S&T's Tier 1 University Transportation Center, which recently received a \$1.4 million grant from the U.S. Department of Transportation.

Zoughi praises Brinker as a "remarkable, hard-working, intelligent and meticulous young lady" who has a bright future ahead of her.

"Her academic performance has been outstanding," he says, "and yet she still finds time to be involved in so many worthy extracurricular endeavors, and does so with a very high level of energy and enthusiasm."

Brinker, in turn, credits Zoughi for further inspiring her to conduct research.

"This undergraduate research experience has provided a lot of opportunities for me," Brinker says. "I probably wouldn't have gotten the NASA fellowship without it."

By the time the ultraviolet spectrograph for which she helped write the software starts snapping images of Jupiter's moons in 2030, Brinker may well be on her way to developing her own new tools for space exploration.



The Missouri S&T Mars Rover Design Team won the 2017 University Rover Challenge, an international design competition where teams showcase potential next-generation Mars rovers.

The team finished first among 35 collegiate teams at the University Rover Challenge, held last summer at the Mars Desert Research Station in Hanksville, Utah. The competition is designed to demonstrate the fundamentals of remote robotic travel and task completion. The Utah desert is used for the annual competition because it resembles the rocky terrain of Mars.

The Missouri S&T team competed against teams from around the world. Countries represented include Bangladesh, Canada, India, Poland and Turkey in addition to the United States.

RESEARCH TEAM HELPS BOEING SET UP NONDESTRUCTIVE EVALUATION LABORATORY

Researchers at the department's Applied Microwave Nondestructive Testing Laboratory (amntl) recently worked with The Boeing Company to establish a new laboratory that uses millimeter wave technology to improve the detection of potential flaws in coatings, surfaces and materials.

The lab at the Boeing Research & Technology Center in Charleston, S.C., is focused on research and development efforts in areas of advanced manufacturing, with a focus on composite fuselage and propulsion systems production.

The increasing potential of microwave and millimeter-wave techniques to address complex inspection problems led to Boeing's decision to work with Missouri S&T to establish the laboratory. It will be used to address a number of needs spanning materials characterization and high-resolution imaging.

Microwave and millimeter wave NDE can be used to detect flaws under attenuative materials, make precise thickness measurements of dielectric coatings and even detect small surface cracks in metallic structures. Boeing and amntl researchers are working together to investigate a millimeter wave crack-detection approach that could significantly improve ultrasonic and eddy-current approaches currently used for small-crack detection associated with widespread fatigue damage.

The lab design was led by **Reza Zoughi**, Schlumberger Distinguished Professor of Electrical and Computer Engineering and director of the amntl. The team also included **M.T. Ghasr**, associate research professor of electrical and computer engineering; **Jeffrey Birt**, a technical assistant in the ECE department; and several ECE students.



ECE GRAD DELIVERS WINTER COMMENCEMENT ADDRESS

Kelcey Yunghans' tinkering ways started early.

The December 2017 graduate, one of four seniors chosen as student commencement speakers, described her first engineering project: an attempt to remove the engine from her mom's car as a five-year-old. That early experiment was followed by trying to take apart the thermostat in an elementary school classroom.

That self-described "passionate curiosity" led her from Liberty, Missouri, to S&T, where under the guidance of **Ian Ferguson**, she conducted research into solid state lighting and its applications and contributed to two research papers.

"Everyone sitting here has that curiosity, that fire and passion, that still drives us," she told her fellow new graduates. "It has taken all of us through seemingly impossible classes (and) sleepless nights to opportunities that surprised us. And if we let it, it will continue to push us on to new experiences, new advancements, and new beginnings."

An active member of IEEE, Kappa Mu Epsilon and Phi Sigma Pi, Yunghans now works for Boeing.



100 YEARS OF ECE

By Daryl Beetner

Top left: The student branch of the American Institute of Electrical Engineers in 1940.

Lower Left: **Austin McRae** was the lone faculty teaching electrical engineering until 1914, when he became MSM's 10th director. He was a major force in establishing engineering degree programs at MSM (and was also MSM's first capable football coach).

Lower Right: **Jean McCaw Lloyd** was EE's first female graduate. She graduated in 1944.

Right: **C. James Grimm** (faculty 1943-74) with students testing an electric motor.

It's been a shade over 100 years since the university awarded its first electrical engineering degree — an act that required legal intervention by the state of Missouri's highest court.

The Missouri School of Mines and Metallurgy was established in 1870, during a time of significant discovery in electrical engineering: the era of James Clerk Maxwell, William Wallace, Alexander Graham Bell and Thomas Edison. By the 1890s, electrical engineering classes were being offered in the physics department.

But MSM couldn't offer a degree in electrical engineering until state lawmakers passed the Buford Act in 1915, which also created professional degree programs in mining engineering, metallurgy, mechanical engineering, chemical engineering and civil engineering.

Officials with the University of Missouri, however, didn't want to see the creation of a competitor to the Columbia campus, and with the help of the Board of Curators chose to ignore

the new law. Rolla student **Harry Tobias Heimberger** sued, and the state Supreme Court ordered the University of Missouri to properly implement the programs. Heimberger went on to become the first MSM graduate with an electrical engineering degree in 1917.

Much has changed since then. Electrical engineering was initially part of the department of physics and electrical engineering, and did not become its own department until 1924. The department was housed in Norwood Hall, with a single lecture hall in the building's northeast corner and some laboratories located in the basement. In 1920, just six students and four faculty members called electrical engineering home, and students were required to take between 185 and 197 credit hours to graduate. By 1945, the department had grown to 126 students.

Today, Missouri S&T and the electrical and computer engineering programs are recognized as among the top in the country, both for their research output and their outstanding quality of students. The department offers bachelor, master's and doctoral degrees in electrical engineering as well as in computer engineering, which came into the fold in 1998. We now have 36 faculty serving 738 students.

Electrical engineering got its own building in 1959 and saw that building expanded in 1998, when it was named Emerson Electric Company Hall. While students now only take 128 credits, I'd wager there is a much greater quantity and diversity of information stuffed into each credit hour than 100 years ago.

NOTABLE FACULTY AND GRADUATES

The lack of a formal electrical engineering degree in our early days didn't keep several physics students specializing in electricity from becoming highly accomplished in the field.

Mervin Kelly, for example, graduated in 1914 and went on to become the president of Bell Telephone Laboratories, leading the lab during the invention of the transistor.

George Mueller, EE'39, was associate administrator of NASA's Office of Manned Space Flight from 1963-69 and a major force in the Apollo mission to the moon and in the planning for Skylab.

In 1944, **Jean McCaw Lloyd**, the daughter of long-time MSM faculty member **Sam Lloyd**, became the first female electrical engineering graduate, ranking 10th in a graduating class of 77. Although Lloyd qualified for membership in the Tau Beta Pi engineering honor society, she was only allowed to be an honorary member of the all-male club. One year later, **Amy Goodue West** — also the daughter of an MSM faculty member — became the second female electrical engineering graduate.

Theodore L. "Ted" Weise, EE'67, is a retired president and chief executive officer of Federal Express Corp. He worked as a pilot while a student in Rolla, and went on to serve as assistant vice president of operations for Sun Airlines and a flight test engineer for the U.S. Air Force F-111 plane with General Dynamics Corp. at Eglin Air Force Base in Florida. Missouri S&T recognized him with an Award of Professional Distinction in 1994 and an honorary doctorate in 2000.

Roy Wilkens, EE'66, launched and served as president of Williams Telecommunications Group, one of the nation's first optical communications companies and later a foundational block of MCI WorldCom. He is also a retired chief executive officer of networks for McLeod USA. Wilkens has endowed a named professorship in the department.

John P. Fairbanks, EE'71, created both the TI-30 calculator and the Poquet computer — two inventions at the vanguard of personal computing. He began his career at General Motors, moved to Texas Instruments and went on to become vice president of engineering for Mattel Electronics before founding the company that built the first sub-notebook-style computer using what is now known as voltage and frequency scaling.

Steve Sullivan, EE'89, is a principal engineer at Industrial Light and Magic, filmmaker George Lucas' visual effects company. Sullivan won an Academy Award for technical achievement in 2001.

Sandra Magnus, Phy'86, M.S. EE'90, is a former NASA astronaut now serving as executive director of the American Institute of Aeronautics and Astronautics. She flew four missions aboard the International Space Station, logging 133 days in orbit.

Fairbanks, Magnus, Mueller, Sullivan, Weise and Wilkens are each members of the university's Alumni of Influence.

STUDENT TEAM MAKES FINALS OF IEEE SPACE ANTENNA DESIGN CONTEST

A three-person team of ECE students competed for top honors in an international competition to construct more reliable antennas used in space travel by small satellites.

The S&T team was one of six finalists, including university teams from Canada and Sweden, in an IEEE student design contest that required student engineers to design and build antennas linking a ground station with a research spacecraft known as a cube satellite, or CubeSat.

The miniature satellite designed by two S&T graduate students and one undergraduate consists of three units, each measuring 10 cubic centimeters. That's about the size of a single-serving cereal box found on a grocery store shelf.

Team leader **Ali Foudazi**, a doctoral student in electrical and computer engineering, and his colleagues developed a spiral antenna with a broad frequency range and the widest possible bandwidth that can be folded into a balloon attached to the CubeSat. Once in space, the hemispherical antenna would be released, unfolding to its full size.

Mohammad Tayeb Ghasr, an associate research professor of electrical and computer engineering and the team's faculty advisor, says his students' "out-of-the-box thinking" has the potential to be more broadly embraced by other space engineers and scientists, including those working for the National Aeronautics and Space Administration (NASA) as well commercial interests.

Other team members are **Atieh Talebzadeh**, a doctoral student in electrical and computer engineering and Foudazi's wife, both of Tehran, Iran; and **Matthew Dvorsky**, EE'17, of Peoria, Illinois, who received his bachelor's degree in May.



MOHAMMAD TAYEB GHASR

Associate research professor of electrical and computer engineering

SEVEN INDUCTED INTO S&T ACADEMY OF ELECTRICAL AND COMPUTER ENGINEERING

We're pleased to welcome seven new members to the Academy of Electrical and Computer Engineers, an advisory group of alumni and other industry leaders who have made outstanding contributions to their profession.



Dean S. Ford, EE'95, of Baltimore, is the chief operating officer and executive vice president for Westin Engineering Inc. A certified automation professional, Ford is a licensed control systems engineer in 15 states and a member of several professional organizations.



Tina E. Gaines, EE'89, of Baxter Springs, Kansas, is the director of engineering for the Empire District Electric Co. A member of the Missouri S&T Corporate Development Council, Gaines has given presentations at S&T's Expanding Your Horizons and for the Chancellor's Leadership Academy.



Mark R. Hoffman, EE'86, of St. Louis, is the president and co-founder of Automation and Control Concepts Inc. He founded Mark Hoffman and Associates Inc. in 1994 and served as company president until 1996, when he co-founded Automation and Control Concepts, which is one of the top five largest systems integrators in the Midwest and one of the top 50 worldwide.



Marcus A. Huggans, EE'96, M.S.'97, Ph.D.'98, of Mesquite, Texas, is the senior director of external relations for the National GEM Consortium. Huggans is also a former director of student diversity and academic support programs at Missouri S&T.



Kevin J. McEnery, EE'86, of St. Louis, CEO of McEnery Automation Corp., began his career as an applications engineer for Wilco Precision Testers. He is also a member of the Missouri S&T Corporate Development Council.



Michael E. McEnery, EE'85, of St. Louis, is the president of McEnery Automation Corp. He began his career with Boise-Cascade and worked for Bussmann, French Gerleman Electric and FeedForward Inc. before becoming president of McEnery Automation in 1993.



Gregory A. O'Neill Jr., EE'65, of Rockledge, Florida, is the chairman of Helical Communication Technologies. He also holds a master of electrical engineering degree from the Illinois Institute of Technology. O'Neill holds over 20 U.S. patents in antenna and radio technology. He is a senior life member of IEEE and past vice chair for the Canaveral Section.

MEMORIALS



Jack Bourquin



Charles McDowell

JACK BOURQUIN

Dr. **Jack Bourquin** served on the ECE faculty from 1968 to 2001. A dedicated instructor, "Happy Jack," as he was sometimes known, was once described by a student as "way too excited about circuits for an 8 a.m. class." Bourquin died on Oct. 14, 2017 at the age of 83. Two of his children attained degrees in EE at Missouri S&T and a grandson is currently a sophomore at S&T in computer science.

CHARLES MCDOWELL

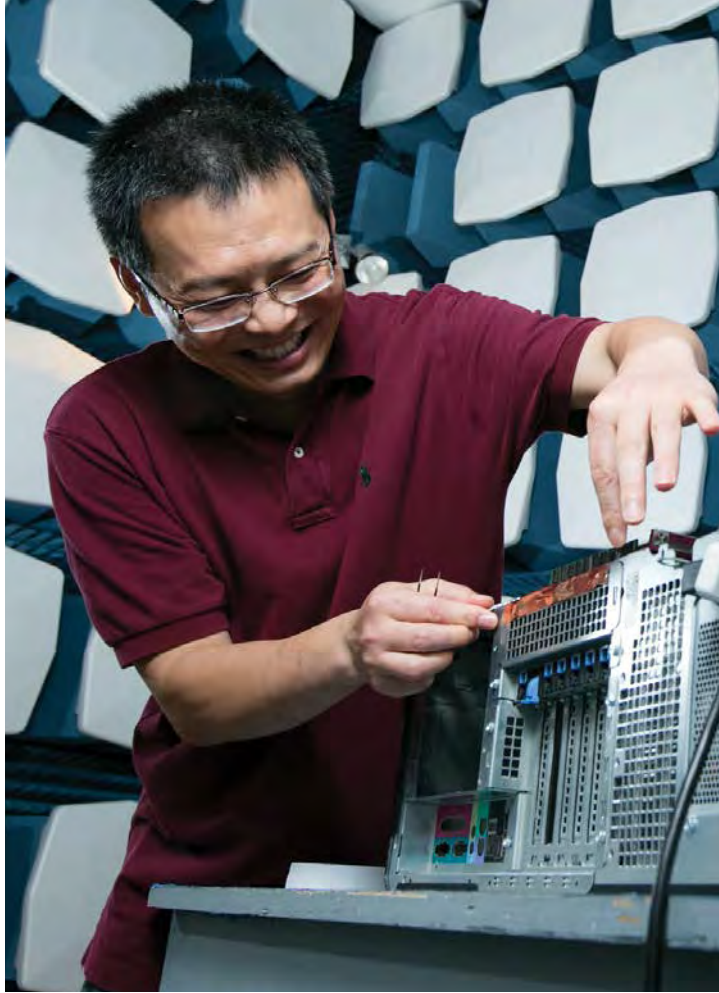
Dr. **Charles McDowell** died on Nov. 6, 2017 at the age of 87. He received his undergraduate degree at Missouri S&T and his graduate degrees from the University of Michigan. He was an assistant professor in ECE from 1978 to 1987.

GEORGE MCPHERSON JR.

Dr. **George McPherson Jr.** died on Dec. 18, 2017, at the age of 96. He began his teaching career after serving time as a project engineer for the U.S. Naval Research Lab. He joined Missouri S&T in 1956 and retired in 1985 as a professor emeritus after serving 29 years on the faculty. He was a member of the Academy of Electrical and Computer Engineering.



George McPherson Jr.



S&T RESEARCHER STUDIES NEXT GENERATION PHONES, CARS

In 10 years, your cellphone won't look anything like it does today — at least on the inside. The phones, with 5G technology, will be 10 times faster than they are today. And self-driving cars won't be a novelty, they will be part of your daily commute.

A Missouri S&T researcher is working to make those goals a reality — a safe reality — by deciphering and solving the problems of electromagnetic interference inherent in the systems. **Jun Fan**, professor of electrical and computer engineering at Missouri S&T, is using a Google grant to provide real-world solutions.

Every electronic device emits electromagnetic radiation, and cellphones are no different with their multiple channels and multiple digital and analog circuits. "Noise," or electromagnetic interference,

affects the performance of multiple input, multiple output (MIMO) systems by slowing the speed of apps and downloads, dropping calls and making calls you do receive sometimes hard to hear clearly.

Those issues can be frustrating, but they're not life-threatening — but keeping self-driving cars safe is.

"We need to make these devices, phones and cars, work in a real-world setting," Fan says.

Fan's work in the Missouri S&T Electromagnetic Compatibility (EMC) lab

tests current cellphones to understand the interference and its effect on the performance of over-the-air MIMO systems. The lab has a fully enclosed electromagnetic quiet room equipped with wave-absorbing material on three walls and the ceiling, with big pads and smaller egg crate shapes. Here the researchers gauge the radiation from electronic devices' transmitters and receivers.

New technology moves quickly, and it's necessary to understand today's phones to get to that fifth-generation 5G future. Current international standards for 4G phones set peak speed requirements of 100 megabits per second for high mobility communication (auto users) and 1 gigabit per second for low mobility communication (pedestrians and stationary users).

The information gleaned by studying cellphones can be applicable to autonomous automobiles, Fan says. Just as reducing interference in phones can lead to better performance, reducing interference in and among self-driving cars will make them safer when multiple vehicles are on the road. Of course, infrastructure investment in and surrounding roads will be necessary to keep the communications between autos clear and direct.

"Google wants to see if results to de-bug fail, what went wrong," Fan says. "If it was interference, what kind of interference is it?"



ZHENG NAMED WILKENS PROFESSOR

Yahong Rosa Zheng, a wireless communications expert and member of the Missouri S&T faculty since 2005, is the new Roy A. Wilkens Missouri Telecommunications Professor. Her appointment took effect on Sept. 1, 2017.

The professorship was established by telecommunications pioneer **Roy A. Wilkens**, EE'66, former president of Williams Telecommunications Group, which later became WorldCom. He is also a retired chief executive officer of networks for McLeod USA.

Zheng succeeds the first Wilkens Professor, **Steven L. Grant**, who was named in 2005 and held the title until his death in April 2016. She joined ECE following a two-year stint as a postdoctoral fellow at the University of Missouri-Columbia.

An expert in wireless communications and underwater cyber-physical systems, she has received funding from several federal agencies, including the National Science Foundation, the Office of Naval Research, the U.S. Department of Transportation and the Army Research Office. She received an NSF Early Career Award in 2009 and was elected an IEEE Fellow in 2015. Most recently, she was named the IEEE Vehicular Technology Distinguished Lecturer.

Zheng holds a Ph.D. in electrical engineering from Carleton University in Ottawa, Canada; a master of science degree in electrical engineering from Tsinghua University in Beijing, China; and a bachelor of science degree in electrical engineering from the University of Electronic Science and Technology of China in Chengdu, China.

Currently an associate editor for the *IEEE Journal of Oceanic Engineering*, she previously served as an associate editor for *IEEE Transactions on Vehicular Technology* and *IEEE Transactions on Wireless Communication*.

→ RANDY MOSS RETIRES

Randy Moss retired in 2017 after 36 ½ years on the ECE faculty. He received B.S. and M.S. degrees from the University of Arkansas, and his Ph.D. from the University of Illinois before joining S&T in 1981. During his career, in Moss's words, he "cobbed together a decent number of refereed journal articles, in spite of the indecent words he muttered as he wrote them, and a number of conference papers." The winner of several university awards for outstanding teaching and faculty excellence, he also won the 10th annual Pattern Recognition Society Best Paper Award, the American Institute of Aeronautics and Astronautics St. Louis Section

Lindbergh Award, the Ralph R. Teetor Educational Award, and the honorable mention for the C. Holmes MacDonald Outstanding Teaching Award of Eta Kappa Nu.

He plans to continue to help the department by teaching some courses while in retirement, in addition to spending time with his grandchildren.



RANDY MOSS

Professor emeritus of electrical and computer engineering

NEW FACULTY MEMBER TO FOCUS ON REAL-TIME POWER LINE MONITORING

Please join us in welcoming **Rui Bo**, our department's newest faculty member, who comes to ECE after nearly a decade in private industry.

Bo specializes in computation, optimization and economics in power system operation and planning, as well as high-performance computing and electricity market simulation, evaluation and design.

He holds a Ph.D. in electrical and computer engineering from the University of Tennessee and joined Missouri S&T in August 2017 from Midcontinent Independent Transmission System Operator in Minnesota, where he served as a principal engineer and project manager.

In that job, he helped design high-voltage transmission upgrades worth over \$5 billion that increased the efficiency and reliability of the power grid and enabled integration of renewable energy.

While at Missouri S&T, Bo hopes to build a real-time power line monitoring system using advanced sensing technology. This system will enhance operational efficiency, system observability and grid resilience.

Bo also wants to develop high-performance computing tools using Graphics Processing Units to improve the ability to tackle computationally intensive problems like contingency analysis, probabilistic power flow and economic dispatch.

Finally, he will explore creation of state-of-the-art electricity market monitoring platforms which use big data analytics and deep machine learning to identify deficiencies in the power marketplace and to help develop changes which ensure fair and efficient electricity markets.



RUI BO

Assistant professor of electrical and computer engineering



To celebrate excellence in the classroom and contributions toward student service, four Missouri S&T faculty members were honored by the College of Engineering and Computing with the title of Dean's Educator Scholar. The two-year title includes a \$5,000 stipend. Winners included ECE faculty **Joe Stanley** and **Theresa Swift**.

STUDENT AWARDS

Amir Ghazanfari, W. Li, M. C. Leu, J. Watts, Y. Zhuang, and advisor **J. Huang** won the Best Student Paper award at the 2016 Conference on Smart Materials, Adaptive Structures and Intelligent Systems.

M. Aman and advisor **E. Cetinkaya** won the Best Student Paper award at the 2017 International Conference on Design of Reliable Communication Networks.

Amad Alzahrani, along with ECE faculty **Mehdi Ferdowsi** and **Pourya Shamsi**, won the Best Poster Award at the IEEE International Conference of Renewable Energy Research.

John Gallion received a Graduate Fellowship from the American Society for Nondestructive Testing.

The Gamma-Theta chapter of HKN won the Outstanding Chapter Award.

College of Engineering and Computing Dean's Ph.D. scholars:

- **Ali Foudazi** (advisor **Kristen Donnell**)
- **Atieh Talebzadeh** (advisor **David Pommerenke**)

Missouri S&T won a number of awards from the IEEE St. Louis section, including:

- Outstanding Student Member — **Katelyn Brinker**
- Outstanding Student Branch
- Outstanding Young Engineer — **Trevor McCasland**
- Outstanding Branch Counselor — **Amardeep Kaur**

ECE FACULTY AWARDS

Steve Watkins won the IEEE-USA Jim Watson Student Professional Awareness Achievement Award for "sustained contributions to the professional development of students and for outreach to precollege students." Watkins and student **John Ciezki** won the Outstanding Technical Paper Award at the 2017 American Society for Engineering Education Midwest conference.

Chulsoon Hwang, along with **David Pommerenke** and **Jun Fan**, received the Best Paper Award at the Asia-Pacific EMC 2017 conference.

Maciej Zawodniok and his students won a Best Paper Award at the 2017 IEEE International Conference on Smart Computing.

Mehdi Ferdowsi was given the Outstanding Professor Award of Excellence by S&T for his performance in distance education classes.

Faculty were recognized in every category of Missouri S&T's yearly faculty awards:

- Faculty Achievement Award — **Theresa Swift**
- Faculty Excellence Award — **Mehdi Ferdowsi**
- Faculty Research Award — **Y. Rosa Zheng**
- Faculty Service Award — **Steve Watkins**
- Faculty Teaching Award — **Kelvin Erickson**

Outstanding teaching awards and commendations:

- **Daryl Beetner**
- **Mariesa Crow**
- **Kelvin Erickson**
- **Jun Fan**
- **Mehdi Ferdowsi**
- **Jonathan Kimball**
- **Kurt Kosbar**
- **David Pommerenke**
- **Jagannathan Sarangapani**
- **Joe Stanley**
- **Theresa Swift**
- **Reza Zoughi**

FERGUSON JOINS ROYAL SOCIETY OF ARTS

Ian Ferguson, professor of electrical and computer engineering, was named a fellow of the Royal Society of Arts (RSA) in June 2017.

The RSA — formally known as the Royal Society for the Encouragement of Arts, Manufactures and Commerce — was established in 1754 in

London to enrich society "through ideas and action." The organization focuses on supporting innovation in creative learning and development, public services and communities, and enterprise and manufacturing.

The 28,000-member RSA fellowship's members have included several notable luminaries throughout history, including Adam Smith, Benjamin Franklin, Charles Dickens and Stephen Hawking.

Ferguson was recognized by the RSA for his entrepreneurial mindset in

academia, industry and the non-profit sector. His research has contributed to the development of next-generation solar and solid state lighting and has resulted in more than 480 scholarly publications. Ferguson's work has also contributed to the development of light-emitting diode (LED) semiconductors, which are now part of a \$1 billion-a-year industry. He also co-founded a green business incubator — PiES, or the Project for Innovation, Engineering and Sustainability, based in Davidson, N.C.

Ferguson served as vice provost and dean for the College of Engineering and Computing at Missouri S&T from August 2014 through the fall of 2015.



IAN FERGUSON

Professor of electrical and computer engineering



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GRADUATION DOESN'T MEAN GOODBYE.

Tell us how you're doing. We'd love to hear about new appointments, degrees earned, job promotions and other family or professional news. Get in touch with your department by emailing ece_alum@mst.edu.

Tell us what you're doing with a degree in electrical or computer engineering so we can feature your accomplishments among our alumni achievements.

JESSE CURETON, EE'17

Software engineer at Garmin

