

# Arkansas ENGINEER

The alumni magazine of the University of Arkansas College of Engineering **SPRING 2016**



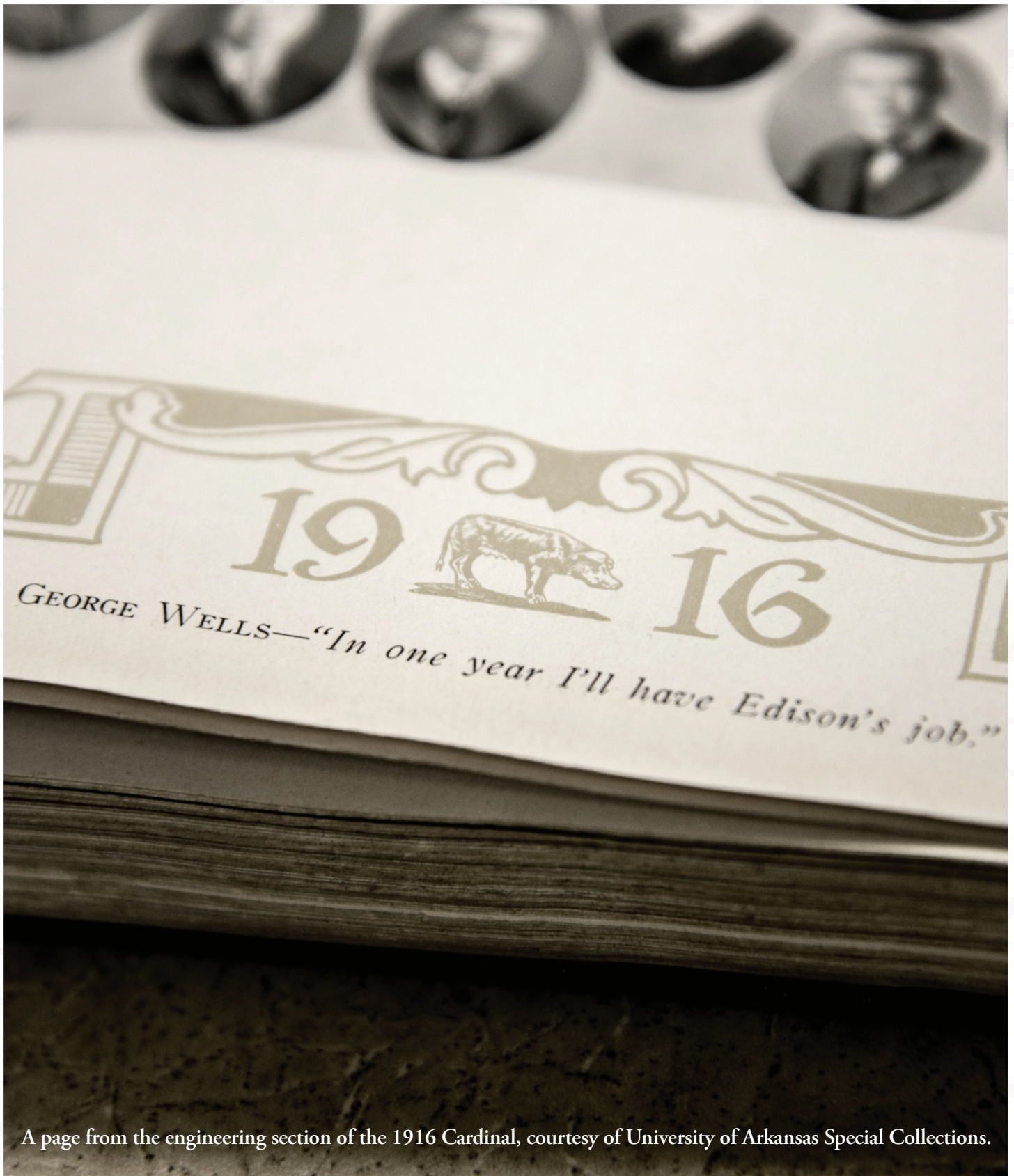
## ENGINEERING THE SPACE SHUTTLE PROGRAM

Rita Willcoxon, BSIE '82

## NEW CENTERS, NEW RESEARCH

Over the past year, four new centers have emerged with College of Engineering faculty in leadership roles.





A page from the engineering section of the 1916 Cardinal, courtesy of University of Arkansas Special Collections.

## A message from the dean



### John English

Dean, College of Engineering  
Irma F. and Raymond F. Giffels Endowed Chair in Engineering

Thanks for taking a look at the Spring 2016 issue of the Arkansas Engineer. We're introducing a new look for the magazine, and I'm very excited about this issue. In it you can read about Rita Willcoxon, who used her industrial engineering degree to lead NASA's space shuttle program. You will also learn about our new research centers, which are helping us stay on the cutting edge and find solutions to the world's most pressing problems.

We also have a new online version of the magazine: [arkansasengineer.uark.edu](http://arkansasengineer.uark.edu). On this website, you can find even more stories about our amazing students, faculty and alumni. You can also see all of the college's recent achievements, and read stories from past issues of the magazine.

As always, we love to hear from you! Send news and story ideas to [engrcomm@uark.edu](mailto:engrcomm@uark.edu). And don't forget to update your information with the Arkansas Alumni Association at [arkansasalumni.org](http://arkansasalumni.org).

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# ENGINEERING THE SPA

## RITA WILLCOXON, BSIE '82

On July 21, 2011, Atlantis landed at the Kennedy Space Center and NASA employees gathered to watch this historic event. Atlantis was the last STS — Space Transportation System, commonly known as the space shuttle — to fly on a mission. It was the end of an era, and for many employees, the end of their jobs. The mood was not somber, however; it was celebratory.

“Nobody expected us to be able to perform the way we did on these last few missions,” said Robert Cabana, the director of the Kennedy Space Center, as he addressed the crowd of employees. “You performed flawlessly right up to the very end. I can’t say enough good things about the dedication this team has.”

Cabana then called Rita Willcoxon up to the front of the crowd. As the Director of Launch Vehicle Processing at NASA, Willcoxon led the shuttle program in its final six years, and was largely responsible for the positive nature of the event. Referring to her and Patty Stratton, a contractor who worked with the shuttle program representing the United Space Alliance, Cabana said “I don’t know of any two people that care more about this team than the two standing here now. They take care of you like you wouldn’t believe.” He then awarded Willcoxon a Distinguished Service Medal for “continuous outstanding leadership contributions provided to the nation’s space shuttle program.”

In a move that was emblematic of her leadership style, Willcoxon leaned over to the microphone and gave all the credit to her employees. “It’s all about you guys,” she told the crowd. “It’s not about us. You’re the best team ever.”

### A WELL-ROUNDED EDUCATION

Rita Willcoxon grew up as Rita Patterson, and went to Southside High School in Fort Smith, Arkansas. As a child, she loved math, and decided she wanted to focus her career around it. She learned about industrial engineering from IE professor John Imhoff at an orientation at the U of A. “He was so dynamic,” she remembered. “I thought, I want to do what that guy does.”

As a student, Willcoxon took on two different and challenging roles: engineering student and majorette. She has fond memories of studying with fellow engineering students and of twirling a baton on the field while the Razorback band played the fight song. In 1980 she was crowned St. Patricia in the annual Engineer’s Week celebration.

Willcoxon married her high school sweetheart, Jim, the summer after graduating college. Jim was attending Oklahoma City University. After she graduated, they moved to Oklahoma City, where Jim had a job as a high school teacher. Willcoxon’s first engineering job was at Tinker Air Force Base, where she focused on aircraft maintenance performing fixture design, facility layout, equipment management and logistics studies.

After a few years in Oklahoma, the Willcoxons decided to move to a warmer climate, so they both started looking for jobs in Florida. Rita found a job with the Defense Contract Management Administration. In this role, she represented the government at the Harris Corporation. From there, she started working for NASA, where she had a series of jobs in the space industry, working her way up the ladder and honing her management style.





# SPACE SHUTTLE PROGRAM

## A CAREER IN SPACE

Willcoxon began working at Kennedy Space Center in 1988, in the Payload Operations Directorate. From there, she worked in several key leadership positions at Kennedy and led agency wide teams, and she had a year-long assignment at the Jet Propulsion Laboratory. She has been involved in several Spacelab missions, the Magellan mission, the European Retrievable Carrier (EURECA), the Gamma Ray Observatory, and the Cassini mission. Her work supported the Space Shuttle, International Space Station and Expendable Launch Services Programs, as well as future NASA programs.

One of the highlights of her career was being part of a team that designed a mission to Mars. For this mission, which unfortunately never took place, a spacecraft would convey a rover to the surface of Mars. The rover would collect samples, which it would send into orbit on a rocket. A spacecraft would pick up a payload canister full of Martian rock and soil samples, and it would convey the samples back to Earth. Willcoxon was responsible for the design and mission requirements of the rocket element of the mission.

Over the years, Willcoxon has earned numerous awards. In addition to the Distinguished Service Medal, she has received the Silver Snoopy award, two Exceptional Achievement Medals, the Outstanding Leadership Medal and an Exceptional Service Medal. When the Space Shuttle Program reached its final flight, the U.S. Senate honored the men and women of the program with Senate Resolution 233, and Willcoxon received a personal copy from Senator Bill Nelson with a thank you note.

In the course of her career, Willcoxon's industrial engineering point of view proved useful. She is an expert in the ways technology and people work together, and she worked to ensure that NASA's systems were designed to be operated and repaired easily and cost-effectively. While mechanical and electrical engineers focus on how devices and systems work and how much they cost to build, it is the role of an industrial engineer to look at how these designs affect the people who interact with the technology.

"When you are operating a vehicle, it needs repairs and maintenance," Willcoxon said, explaining that this raises several questions for an industrial engineer. "How many times will you change the parts? What materials will you need? Will the parts need to be uniquely made or will they be standard? How much staff will be required to maintain the vehicle? What is the schedule timeline?"

## THE SPACE TRANSPORTATION SYSTEM

In 2006, Willcoxon became the Director of Launch Vehicle Processing. In this role, she was responsible for the launches of the Discovery, Atlantis and Endeavour shuttles, and she managed approximately 5,400 civil service and contractor employees.

The first space shuttle, Columbia, launched in 1981. Over the next three decades, these vehicles carried more than 600 crewmembers and over 3 million pounds of cargo into space. During the six years that Willcoxon oversaw the program, Discovery, Atlantis and Endeavour launched 21 times, carrying astronauts, supplies, laboratories and equipment for the International Space Station. In previous years of

Continued on the next page...

**"IN EVERYTHING YOU DO, THE PEOPLE ARE KEY**

That's why my number one priority is the people. Because I feel like if I take care of them, they take care of everything else"





the Shuttle Program, the shuttles carried communications and defense satellites, and they transported interplanetary spacecraft, such as Galileo, and telescopes, including the famous Hubble Space Telescope.

Willcoxon was the first and only woman to have this NASA director position. She explained this as a sign of changing times. “This organization for a long time was mostly men,” she said. “If you look at my direct reports right now, 50 percent are women.”

When it came to her gender, Willcoxon said, “I’ve really not felt like there’s been any holdback at all. Maybe it’s just my personality. I’m never going to back off of an opportunity. If somebody thinks I can do something, I’m going to step up and try to do it.”

#### INTEGRATING TECHNOLOGY AND PEOPLE

Willcoxon and her employees were responsible for making sure that the space shuttles were completely prepared for their journeys. The contents of the shuttles, called the payload, had to be carefully designed, prepared and packed away for the journey, and Willcoxon’s industrial engineering training and previous payload experience made her an expert in the processes needed to make sure each shuttle’s payload was safe and secure.

Before a shuttle launched, workers had to check that all the components of the payload had been tested to make sure the

materials would survive in the harsh environment of space, and that all the equipment would work properly. Then, they had to figure out the best way to integrate the payload into the shuttle. It needed to be securely held in place, making the best use of the limited capacity of space and weight the shuttle had to offer. Finally, the entire arrangement had to be thoroughly tested through simulations, and everything had to be double checked before launch.

The shuttle missions involved complex arrangements of equipment and technology, but Willcoxon pointed out that behind each mission there was also a complex arrangement of people. Willcoxon and her teams worked alongside government contractors, university faculty and employees of other NASA labs, such as the Jet Propulsion Lab. Each group had a distinct culture and a different set of norms and expectations. Like the different components of the payloads, these had to be integrated so they could work together effectively.

“At Kennedy, everything came together,” said Willcoxon, explaining that she used similar problem solving skills on both technical and human problems. “You’ve got to be very customer oriented when a lot of people and organizations are giving you requirements,” she explained. “A lot of people are throwing things your way, so you’ve really got to be able to have a lot of patience, and you’ve got to be able to work really well with other people. You’ve got to work hard to understand what it is they need you to do with their hardware that they’re bringing here, and that now you’re responsible for integrating it all together and getting it ready for launch. So there’s a lot of communication, a lot of forums.”

For Willcoxon, solving human problems meant being accessible to everyone she worked with, and paying close attention in order to catch issues before they became a problem. “I have small group meetings with people to talk one-on-one about what their issues are,” she said. “It’s just another way to make sure that they know that I’m always there for them, and that my focus is on the people.”

#### LIFE AFTER THE SHUTTLE

Once the space shuttle program ended, Discovery, Atlantis and Endeavour were moved to their final homes in museums, where they will be remembered and honored. Willcoxon explained that the thing she is most proud of in her career is the way she was able to honor the employees who had worked in the program, as well. Her employees made a “human shuttle” in a parking lot and videotaped it for YouTube. Willcoxon honored all the shuttle employees who had been with the program from the beginning as “Shuttle Legends,” conducting special ceremonies and providing them with a Shuttle Legend patch. She and her management team even organized a Jimmy Buffett concert for employees after the last shuttle launch. “I tried to make people feel special, pointing out to them that they were a part of history,” she said. “They had a tremendous amount to be proud of.”

Five months after the shuttle program ended, Willcoxon began a job at General Electric, Transportation. Willcoxon was still looking out for her employees, and brought several of them with her from NASA to GE. In a more down-to-



earth role, she led a group that put intelligent controls inside locomotives and along train tracks. These systems included safety software and electronic systems that could save fuel and optimize trips. This job took her around the world, to Europe, the UK, Australia, Brazil and all over the United States. After nine months, she decided to back off from the travel, moving down to part time, and then retiring after four years with the company. She and Jim live in Florida, where he was the Principal at Melbourne High School. They have two children, a daughter Erica, 26, and a son, Grant, 21.

With a little more time on her hands, Willcoxon has decided to spend more time at the school where she started on her career path. She visited the University of Arkansas last fall, connecting with the Department of Industrial Engineering and taking part in a Society of Women Engineers career panel, as well as reuniting with her fellow baton twirlers and Pi Beta Phi sorority sisters. After a career filled with solving technical problems and helping people work together, Willcoxon can now use her engineering and management skills to provide a role model for students in the College of Engineering, and they are lucky to have an opportunity to benefit from her knowledge and experience.

“Never stop learning,” is Willcoxon’s advice to students. “Don’t get comfortable. Always push yourself. Don’t be afraid to do something different.”



## FEATURED STUDENT

LIONEL DAVIS, BSME '17



Mechanical engineering student Lionel Davis spent the summer of 2015 as a Global Services and Solutions intern at General Electric. During his internship, he designed the Commutator Brush Clamp Release Tool, which won the company’s internship-wide competition.

All 42 of the interns for Global Services and Solutions took part in the competition to design a device that improved quality, enhanced operations, decreased costs, or simplified current processes for the company. Davis’s tool stood out as a simple way to increase safety and productivity, a good fit for what Davis referred to as “the culture of simplification” at GE.

The tool Davis designed could be used by maintenance workers to safely change the commutator brushes inside the traction motor of a locomotive. These brushes must be changed every 184 days, and Davis explained that, since GE has thousands of locomotives, changing these brushes is a daily operation. Davis discovered the need for a tool when he attempted to change one of these brushes himself.

“These brush holders are usually changed out from beneath the locomotive,” he said. “It is a relatively small working area and the amount of space inside a traction motor is much smaller. The craftsmen mainly use their hands to release the clamps, so I gave it a try and was unsuccessful in my attempt. From this experience I was persuaded to find a reliable solution that would assist craft in the brush change-out process.”

Material he’d learned in Introduction to Machine Analysis with mechanical engineering instructor David Albers proved to be valuable for Davis in his internship. “His class provided a project structure that allowed me to complete the project in such a limited time,” he said. “Although I never got the opportunity to properly design the tool, I knew that the design process would have been very similar to what we practiced in class. He also introduced us to some machinery that happened to be used in the shop, as well as safety tips.”

Davis is part of the Engineering Career Awareness program, which provides support for underrepresented students in order to remove financial and social barriers in their engineering education. He explained that, in addition to funding his education, ECAP provided him with a supportive network of alumni, as well as plenty of opportunities for education and personal growth, such as attending the annual convention of the National Society for Black Engineers.



# FOUR NEW RESEARCH CENTERS SUPPORT INTERDISCIPLINARY INNOVATION

Research centers support collaboration between researchers in different fields and connect faculty with industry. Centers allow researchers to tackle complex problems that couldn't be solved without these connections.

Over the past year, four new centers have emerged with College of Engineering faculty in leadership roles. These centers are addressing everything from new kinds of materials to cybersecurity, but they are all working on projects that have the potential to change our lives for the better.

## CENTER FOR POWER OPTIMIZATION OF ELECTRO-THERMAL SYSTEMS (POETS)

Electric vehicles may be the future of transportation, but only if they become more attractive to consumers than gas-powered vehicles. Researchers at the University of Arkansas play an important role in POETS, a new engineering research center to design and develop higher power density and higher efficiency power electronics for electric vehicles, heavy equipment, airplanes, trains and ships. Researchers will focus on improving current thermal and electrical limits in vehicle designs to make them more fuel efficient and expand their range.

Working with partners from around the world, POETS researchers will build new technologies such as three-dimensional thermal circuitry for cooling, next-generation power converters, and algorithms for coordinating the technologies automatically. They'll look at those technologies from the microchip level all the way up to the entire vehicle.

POETS is supported by an Engineering Research Center award from the National Science Foundation, which is the NSF's most prestigious award, totaling nearly \$40 million over 10 years. The POETS team was one of three selected for the award in 2015 out of almost 200 proposals. Alan Mantooth, Distinguished Professor of electrical engineering and holder of the Twenty-First Century Research Leadership Chair, will serve as deputy director of the research center. Andrew Alleyne, professor of mechanical engineering at the University of Illinois at Urbana-Champaign, will serve as director. Howard University and Stanford University are also partner institutions.



Alan Mantooth

## CYBERSECURITY CENTER FOR SECURE EVOLVABLE ENERGY DELIVERY SYSTEMS (SEEDS)

We rely on the power grid every day, but this vast and complicated system is vulnerable to cyber threats. The goal of SEEDS is to protect the hardware and software that is vital to energy delivery for electricity, oil and natural gas; make the digital systems behind these systems less susceptible to cyberattack; and to provide reliable delivery of energy if such an attack were to occur.

In order to protect our energy delivery systems, SEEDS researchers are working on algorithms for software modules that can be incorporated into equipment such as fault-current limiters, breakers, measurement units, relays, wireless communications systems and power-line communications.

The center is made possible by a \$12.2 million grant from the U.S. Department of Energy, augmented by \$3.3 million in matching funds from the research partners. In addition to the U of A researchers, all of whom are associated with the university's National Center for Reliable Electric Power Transmission (NCREPT), the new cybersecurity research center includes faculty from the University of Arkansas at Little Rock, Carnegie Mellon University, Florida International University and Lehigh University. Arkansas Electric Cooperative Corporation, a Little Rock-based generation and transmission cooperative, will serve as an industry partner.

Mantooth will also serve as executive director of the SEEDS research center. SEEDS and POETS join the existing NSF Center on GRid-connected Advanced Power Electronic Systems (GRAPES) to create a powerful research ensemble in the area of power electronics for energy, security and transportation.

## CENTER FOR ADVANCED SURFACE ENGINEERING (CASE)

Technological breakthroughs in mechanical and surface engineering are leading to the creation of completely new products and materials, and to improvements in products we use every day. A new statewide center focused on advanced surface engineering is bringing together top researchers in this field and connecting them with industry and education in the state to ensure that Arkansas can make the most of these breakthroughs.

Researchers at CASE will partner with Arkansas industries to create new products for use in manufacturing, aerospace and defense, agriculture, forestry, oil and gas, food packaging and health care. The center includes four interdisciplinary research teams made up of about 40 faculty members from 10 Arkansas institutions. CASE will also work with industry leaders to develop internships and seminars for Arkansas students.

Plans also include establishing start-up companies to commercialize technologies developed by the center, creating new products and new jobs to bolster the knowledge-based economy in Arkansas while also creating a workforce with the specialized skill-sets necessary to sustain industries that can utilize the center's research. Center researchers and laboratories will mentor students from high school through graduate school in an integrated science, technology, engineering and mathematics pipeline that feeds directly into the center and out to industry.

CASE is supported with a \$20 million grant from the NSF through its Experimental Program to Stimulate Competitive Research (EPSCoR). Min Zou, who holds the endowed Twenty-First Century Professorship in Mechanical Engineering, will serve as the center's director.



Min Zou



## ARKANSAS SECURITY RESEARCH AND EDUCATION INSTITUTE (ASCENT)

It is easier than ever to take advantage of digital technology. Smart devices, the cloud and big data processing techniques provide new opportunities for businesses, governments and other organizations. These new tools all come with additional security risks, however. This new center focuses on spreading security expertise across several different fields.

Researchers at ASCENT focus on four areas, and they plan to connect researchers and industry partners in these areas in order to develop security solutions. In the area of cybersecurity, the center takes advantage of the expertise of the U of A's cyber talent and local industry. In the transportation area, the center hopes to find ways to make supply chain logistics more efficient, while protecting the proprietary information of companies involved. The critical infrastructure area focuses on the digital infrastructure underlying the services we use every day, such as banks, power systems and the internet. This area also looks at future security risks associated with the emerging Internet of Things. Finally, ASCENT plans to focus on our food supply and water supply, finding ways to make sure these remain safe and plentiful.

The director of ASCENT is Jia Di, professor of computer science and computer engineering and holder of the Twenty-First Century Research Leadership Chair. The three co-directors are Chase Rainwater, associate professor of industrial engineering; Dale Thompson, associate professor of computer science and computer engineering; and Steve Ricke, director of the Center for Food Safety of the Arkansas Division of Agriculture.



# ALUMNI STORIES

## LYNDELL “J.C.” GEORGE, BSCE ‘60



Lyndell “J.C.” George arrived at the university as a “poor little country kid.” He paid for his college education by working part-time jobs to finance his coursework, according to his wife, Doris George.

That experience turned out to be particularly meaningful for him. After graduating in 1960, George began a successful career as a civil engineer. His first job was with the Arkansas State Health Department. He then spent a year at the University of Michigan where he earned his master’s degree in engineering.

In 1963, George and his partner, Glen R. Blount, conceptualized the use of lasers for building gravity flow sewer lines and improving the accuracy in establishing grade lines. George and Blount invented the first laser to be used by the construction industry for alignment purposes and founded their company, AGL Corporation, in 1968. During this time, George also worked as the city engineer for Jacksonville from 1965 to 1968.

In 1973, George was named the Outstanding Small Businessman of the year for the central region of the National Council for Small Business Management Development. This prestigious honor brought national attention for the Jacksonville businessman.

George stayed in touch with his alma mater, primarily through the Arkansas Academy of Civil Engineers, and his wife noted that he frequently donated to the scholarships supported by the academy. It was this connection that eventually led her to establish a scholarship in his honor after he passed away in 2013.

“He always enjoyed meeting the students who received the Arkansas Academy of Civil Engineers scholarships,” said Doris. “I thought creating this scholarship in his honor would be particularly meaningful to him.”

Doris George is honoring her late husband’s legacy as a civil engineer and his passion for helping students by establishing a scholarship in his name at the U of A. The Lyndell J.C. George Endowed Scholarship will benefit students in the College of Engineering who are majoring in civil engineering and demonstrate financial need.

Kevin Hall, head of the Department of Civil Engineering, said, “Mr. George was an active and generous supporter of our program and our students. As a long-time contributor to the Arkansas Academy of Civil Engineering Scholarship Program, Mr. George helped numerous students complete their educations. This is a tremendous legacy – enabling the next generation of engineers to follow the paths that he blazed in his career. The Lyndell J.C. George Endowed Scholarship will ensure his legacy continues with future generations. We are so fortunate to have this level of dedication among our alumni and are thrilled to join Mrs. George in honoring Mr. George and his career through this gift.”

## CHARLES ZIMMERMAN, BSCE ‘85

Charles Zimmerman and his wife, Susan, were the first people in each of their families to earn college degrees. Both financed much of their education on their own. Charles, who is originally from Tulsa, began his college career as a music major at the University of Oklahoma. After deciding to switch majors, he asked for recommendations on where to study engineering, and was referred by family and friends to the University of Arkansas. He earned a Bachelor of Science in Civil Engineering in 1985. Susan attended the University of Texas at Tyler.

Charles Zimmerman is now the vice president of international design and construction at Walmart Stores Inc. He has been with the company for nearly 20 years and has almost always been involved in real estate, construction and design. For the last seven years, he has worked on capital expenditures for the company’s facilities on an international level.

Because of their experience working multiple jobs in order to pay for their educations, the Zimmermans feel passionate about helping other first-generation college students facing similar circumstances. Recently, they made a \$250,000 gift

to the College of Engineering, creating the Charles R. and Susan D. Zimmerman Scholarship in Engineering. This scholarship is directed at first-generation students with financial need.

“We want to make sure opportunities exist for future generations of students,” said Charles Zimmerman.

At the university, Charles Zimmerman serves on the College of Engineering’s Dean’s Advisory Council and is a life member of the Arkansas Alumni Association. He was named a Distinguished Alumnus in the College of Engineering in 2009. Susan Zimmerman is a teacher in Siloam Springs and a “die-hard Razorback fan,” according to her husband.

Despite sometimes feeling skeptical about the state of the world today, Charles Zimmerman says he feels encouraged when he returns to campus. “The students at the university today are more socially responsible than when I was in school,” he said. “Every time I’m around the engineering students in Fayetteville, I feel good about the future. They inspire me.”



*Charles and Susan Zimmerman (far right) with their son and daughter-in-law*

## JIM DAVIS, BSEE '79



Jim Davis was born and raised in Prescott, Arkansas. He met his future wife, Marsha, when they were both undergraduate students at Henderson State University. Davis graduated with a Bachelor of Arts in psychology and was commissioned as a 2nd lieutenant through the R.O.T.C. program. After serving two years as a commissioned officer on active duty in the U.S. Army, Davis received an honorable discharge and used the benefits of the G.I. Bill to attend the U of A.

Davis graduated with a Bachelor of Science in Electrical Engineering, while Marsha finished her Bachelor of Science in Education. He worked for Southwestern Bell and ITT Telecommunications. In 1982, Davis joined a small group of engineers who wanted to design a cellular telephone system for small and rural areas. With just pencils, paper and one copy of the Bell Labs’ IS-3B Cellular Specification, the four engineers astonished everyone by creating the fifth cellular system in the country in record time and with only 10 local investors.

Since then, Jim led a team that developed the first cellular system in Russia, and helped start three companies. His work has resulted in six patents. After working with engineers all over the world, Jim knows that the U of A equipped him with the skills he needed to succeed in a global context. He especially appreciated the encouragement of two of his professors, Jim Gattis and Neil Schmitt. In 2011, he received the Distinguished Alumni Award from the College of Engineering.

Davis is now the retired co-founder and vice president of operations for Celcore Inc. Of all the things he has accomplished during his career, what Jim values the most is helping bring cellular phone service to places like the British Virgin Islands, South America, Africa, Russia, Madagascar, Colombia and Greenland. He explained that “many people in some of those isolated areas had never made a telephone call of any kind until our system brought the latest in cellular technology to their mountaintops, their frozen lands and their jungles.”

The Davises have established a graduate student fellowship in the College of Engineering with a \$150,000 gift. The Jim and Marsha Davis Endowed Graduate Fellowship in Electrical Engineering will be awarded to a graduate student who assists the Department of Electrical Engineering’s undergraduate students in learning electrical engineering design.

“We want to do our part to help enhance and reinforce the 21st century vision for the future of the Department of Electrical Engineering at the U of A,” Jim Davis said. “Seeing the level of commitment to set even higher goals for the department motivated us to give back just a small portion of what the University of Arkansas gave to us. We hope our commitment might encourage other alumni to consider giving back to the university as well.”



## FEATURED RESEARCH

### USING SOCIAL MEDIA IN EMERGENCY RESPONSE

Ashlea Milburn, associate professor of industrial engineering, studies the role of social media in emergency response planning. After a disaster, information such as locations of victims and the supplies they need often appear on social media sites such as Twitter, and Milburn's goal is to help responders use this information. She has received a prestigious CAREER award through the National Science Foundation's Faculty Early Career Development Program to support her research, which seeks to find a balance between acting quickly and seeking reliable information..

"One way to accelerate emergency response is to harness the power of social data," said Milburn. "But we have to be careful. Just like everything we hear or read or see on the Internet, we can't believe it's accurate just because it's there. I've talked to many emergency managers who said their agencies take action on social data only after verifying it. This takes time too. Our models will help address this problem."

Milburn's computer models will quantify the value of information at various stages of verification. Algorithms for the models will focus on "uncertain" data, which is information from reports that emergency responders cannot verify or trust, as opposed to information gleaned from "boots-on-the-ground" assessments. Milburn will then use simulated scenarios to compare the results of response planning with and without the help of social media.

Milburn said there are risks associated with ignoring social-media data. Her research is aimed at evaluating the trade-off of getting more information faster with a risk that some of the information may not be accurate. Milburn joined the faculty of the Department of Industrial Engineering in 2010. She received a doctorate in industrial and systems engineering from Georgia Institute of Technology, after earning a master's degree from Virginia Tech and a bachelor's degree from the U of A. Her primary areas of teaching and research are healthcare systems engineering, humanitarian logistics and transportation logistics.



## CHANCELLOR'S SOCIETY

Members of Chancellor's Society have given at least \$2,000 to the university more than ten years after graduating, \$1,000 six to ten years after graduation, or \$500 as students or one to five years since graduation. Listed below are members of the Chancellor's Society who are either engineering graduates or have given to the College of Engineering.

JERRY B. ADAMS  
EDWIN BOYD ALDERSON, LLB 1966  
GERALD S. ALLEN, BSCE 1962  
COLLINS A. ANDREWS  
ANN WILSON APPLGATE, 1996  
DAVID L. BALLENGER, BSEE 1972, MBA 1974  
BENNY J. BARBOUR, BSCE 1961  
REGINALD R. BAXTER, BSCE 1948  
LARRY H. BEAUMONT, MSCE 1977  
HAROLD D. BEAVER, BSCE 1969  
JOSEPH T. BECK, BS 1981  
NATALIE K. BECKNELL, BSCE, 2003, MSCE, 2005  
BOB BIGGADIKE, BSME 1958, MSME 1961  
LARRY BITTLE, BSBA 1971  
LYNNETTE BLACK, BSBA 1987  
IRMA L. BOYER, BSE 1959, MED 1960  
NORMAN ALLAN BRANNON, BSBA 1985, BS 1989, MSOR 1993  
HUGH BREWER, BSEE 1959  
R. H. BROTHERTON, BSCE 1967

CHARLES D. BROWN, BSCE 1951  
KEVIN W. BROWN, BSCE 1981  
JACK E. BUFFINGTON, BSCE 1961  
G. KENT BURNETT, BSIE 1968  
JOHN F. BUSHKUH, BSCE 1958  
JOEL D. CARVER, BS 1974  
SUSAN L. CHADICK, BA 1965  
LING-RONG CHEN, BSCE 1992, MSCE 1994  
WILEY H. CHRISTAL, BSEE 1969, MSEE 1970  
CLAYTON S. COLE, BSIE, 2006  
RANDELL C. COLEMAN, BSCE 1970, MSCE 1971  
CARL COLLIER, 1964  
ANSEL L. CONDRAY, BSCE 1964  
REGGIE A. CORBITT, BSCE 1970, MSCE 1972  
KEITH A. COVERT, BSEE 1985  
J. WAYNE CRANDELL, BSIE 1966  
DAVID G. DANIELS, BSEE 1992, MSEE 1994  
BOB DAVIDSON, BSIE 1970, MBA 1972  
JAMES M. DAVIS, BSEE 1979

EDDIE DIXON, BSIE 1983  
DELWIN E. DODD, BSCE 1961  
SHARON M. DONNELLY, BSIE 1982, MSIE 1983  
ROY L. DOWNS, BSME, 2012  
REUBEN L. DOWNS, BSME, 2012  
JIM DUNAWAY, BSCE 1971  
THOMAS AARON DUNCAN, BSIE, 2005  
MEGAN F. DUNN, BSCE, 2013  
BRETT W. ELDRED, BSCE 1993  
ROBERT BRUCE ELDRIDGE, BSCE 1980, MSCHE 1982  
JOHN R. ENGLISH, BSEE 1981, MSOR 1983  
LEWIS E. EPLEY, BSPA 1961, JD 1961  
THOMAS J. EPPERSON, BSEE 1958  
ROBERT A. ETIEN, BSIE 1966  
CATHY G. EVANS, BSBA 1971, MED 1985  
JEFF FACKLER, MSOM 2013  
RANDALL C. FERGUSON, BSBA 1974  
LAWRENCE H. FLETCHER, BSCE 1960  
TONY DEAN FREEMAN, BSCE 1988  
VIRGINIA O'NEAL GARDNER, BSE 1947  
DAVE GEARHART, JD 1978, EDD 1989  
DORIS R. GEORGE  
JEFF DAVID GEURIAN, BSCE 1989  
PAMELA B. GIBSON, BA 1972, MPA 1976  
HARLEY W. GOODMAN, BSME 1950  
CARL HALFORD, BSEE 1966, MSEE 1967, PHD 1970  
ORVILLE HALL, BSME 1959, MSEM 1961  
BRAD HAMMOND, BSCE 1992, MBA 1994  
STUART W. HANKINS, JD 1972  
ED G. HARDING, BSCE 1967  
BILLY W. HARRELL, BSCE 1956, MSCHE 1958  
WILLIAM A. HARRISON, BSIE 1966  
GRADY E. HARVELL, BSCE 1972  
JERRY HAVENS, BSCE 1962  
ROBERT A. HERRINGTON, BSME 1967  
MAX BYRON HICKS, BSCE 1991  
LYLE M. HOBBY, BSBA 1977, BSEE 1983  
MAC HOGAN, BSME 1965  
JOHN E. HOLLOWAY, BSCE 1985, MSOM, 2007  
GENE HOSEY, BSCE 1977, MSCE 1978  
JOHN HUG, BSEE 1982, MSEE 1988  
STOTTS ISBELL, BSCE 1995  
PRAKASH RAMCHANDRA JALIHAL, MSIE 1972  
JEROME JANSMA, MA 1966, MA 1968, BSCE 1985  
ALICE CLAIRE JERNIGAN, MSCHE 2009, PHD 2014  
KRISTOPHER CODY JOHNSON, BSEE, 2015  
JOE RAY JONES, BSME 1982  
CHARLES H. JONES, BSCE 1985  
MIKE D. JONES, BSAGE 1967, MSAGE 1968  
JAMES D. JORDAN, BSEE 1970  
RAYMOND R. KASKEL, BSME 1967  
BETH KING, BSIE 1969, MSIE 1971  
JOSHUA A. KING, BSCMP 2013  
JACK L. KING, BSEE 1962, MSEE 1963  
RODGER S. KLINE, BSEE 1966  
GEORGE E. KNIGHT, BSCE 1964  
JERRY A. LEACH, BSME 1961  
LYNN M. LEEK, BSCE 1966, MSCHE 1968  
BRUCE DAVID LILLY, BSCE 1992  
AJAY P. MALSHE  
ERIC H. MASON, BSEE 1975, MS 1977  
MARTY D. MATLOCK  
JERRY L. MAULDEN  
MICKY F. MAYFIELD, BSEE 1964, MS 1966  
JAMES E. MCCLELLAND, BSCE 1967  
RAYMOND MCCLELLAND  
JOHN DARREN MCKUIN, BSIE 1993

PATRICK J. MICKLE, BSCE 1973  
ALISON MONROE, BSBA 1989  
PAVAN KUMAR NARENDRA, MSEE, 2007  
KIM LASCOLA NEEDY  
JOHN W. NICHOLS, BSCE, 2010  
STEWART W. NOLAND, BSCE 1975, MSCE 1976  
GARY A. NORCROSS, BSBA 1987  
JERALD NORTON, BSCE 1980  
BEN N. ONUKWUBE, BSCMP, 2011  
THOMAS C. OPPENHEIM, BSCE 1983  
DON PEDERSON  
CHESTER D. PHILLIPS, BSBA 1954, BSIE 1958  
KIRK POND, BSEE 1966  
ADAM JAMES POWELL, BSCE 2005  
JAMES M. RANKIN  
GREGORY D. REED, BSME 1971, MSEE 1973, PHD 1976  
AARON P. RICHARDSON, MSOM, 2012  
BLAKE RICKMAN, MED, 2011  
JOSEPH S. ROGERS, BARCH 1973, BA 1973  
REYNIE RUTLEDGE, BSIE 1972, MBA 1973  
RALPH W. SANDAGE, BSIE 1978, MSE 1984  
JEFFERY C. SANDERS, BSEE 1969  
ASHOK SAXENA  
CHARLES E. SCHARLAU, LLB 1951  
TOM B. SCHUECK  
PHILIP A. SELIG, BSCE 1962  
STEVE SHARP, BSCE 1976  
KENT E. SHREEVE, BSCE 1960, MSCE 1965  
MIKE SHUPE, BSIE 1967, MBA 1971  
GREGORY M. SISTI, BSME, 2004  
RICHARD D. SKINNER, BSCE 1962  
CAROLYN J. SMART, MA 1972  
DEWITT H. SMITH, BSCE 1970  
AMI FRANCES SPIVEY, BSIE 1995  
GEORGE E. STAGGS, BSIE 1971, MSIE 1972  
LARRY G. STEPHENS, BSIE 1958  
JULIAN C. STEWART, BSCE 1957  
BOB STOREY, BS 1980, BSCE 1981  
BRENT MICHAEL STRATTON, BSCE 1992  
SIDNEY SUGG, BSIE 1959  
MICHAEL TERRY TAYLOR, BSCE 1965  
MARVIN PALMER TERRELL, BSIE 1957, MSIE 1960  
C.M. THATCHER  
ROBERT L. THURBER, BSCE 1971  
KEVIN SCOTT TODD, MSCHE 1983, PHD 1984  
DERIK WESLEY TROWLER, BSEE, 2008, MSEE, 2011  
BILL UNDERWOOD, BSBA 1961  
T.A. WALTON, BSCE 1981, MSCHE 1983  
ELIZABETH SALISBURY WARREN, BA 1994  
CAROLYN D. WATTS, BS 1959, MS 1961  
H. NICK WEEDMAN, BSCE 1961  
CHRISTOPHER G. WEISER, BSME 1973  
ED WESTMEYER, BSEE 1960  
KENNETH WHEATLEY, BSIE 1971, MSIE 1972  
JOHN A. WHITE, BSIE 1962  
ANDREW O. WIKMAN, BSCE 1950  
JIM WOMBLE, BSCE 1966  
HELENE L. PASCALE WOMMACK, BSHE 1979  
MICHAEL G. WOOD, BSCE 1984  
FRANK WOOLARD, BSME 1965  
TOM WRIGHT, BSEE 1992  
ARACELI YANEZ, BSCMP 2013  
CHARLES E. YATES, BSCE 1960  
CHARLES R. ZIMMERMAN, BSCE 1985



# CLASS NOTES

## 1950

**LARRY G. STEPHENS** BSIE'58, Hot Springs, Arkansas, graduating in 1958 from the University of Arkansas, Larry Stephens is 79 and still the chairman of Mid-South Engineering Company—now 120 employees strong. He is also the American Society of Plumbing Engineers Engineer of the year.

## 1960

**PHILIP E. BAKER** BSME'62, Houston, not retired yet and still working with Philip E. Baker Properties. Building small office buildings in North West Houston.

**WILLIAM A. HARRISON SR.** BSIE'66, received the Andrew T. Boggs Service Award from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. This award recognizes and Exceptional Service Award Recipient for continuing unselfish, dedicated, and distinguished service.

## 1980

**JOE W. HILL** BSEE'80, Hallsville, Texas, achieved senior member status in the Institute of Electrical and Electronics Engineers and promoted to associate electrical engineer for Eastman Chemical Company.

# IN MEMORIAM

## 1940

**JAMES M. SHIVLEY** BSCE'48, Bandon, Oregon, August 23. After high school he began work in the CCC Camps and then joined the Army Corps of Engineers and went to help with the Panama Canal Commission. He later returned to the U.S. and served for a few more years in the Army. Shivley's passion was construction and he worked on several dam projects throughout the nation. He became an expert at managing construction projects. Survivors: His wife, Lorna R. Shivley, one daughter, two sons, nine grandchildren and eight great-grandchildren.

**JOHN F. MASTERS** BSME'49, Greenville, Mississippi, July 28. He was a U.S. Navy veteran and honorably discharged. He received a degree in mechanical engineering and retired as a manufacturing manager from US Gypsum. Survivors: his wife of 65 years, Maxine Masters, two sons, one grandchild and one great-granddaughter.

## 1950

**KENNETH L. PITCHFORD** BSCE'51, Bakersfield, California, July 25. He served 22 years as a meteorologist with the U.S. Air Force and earned his Masters of Science from New York University. He worked with Mission Control for the first moon landing in 1969. He retired from the Air Force in 1972 and then worked several years in industry before retiring. Survivors: his wife of 61 years, Dreda, three daughters, 10 grandchildren and three great-grandchildren.

**BILL R. PARKEY** BSME'52, Houston, July 23. He retired in 1995 after 43 years in his engineering and business career. Survivors: his wife of 60 years, Ellen, three children and six grandchildren.

**ROLAND L. FINLEY** BSCE'52, Huntsville, Alabama, August 9. He served two years active duty in the medical department of the U.S. Army then in the Army Reserves for many years until he retired at the rank of colonel. He was employed at Boeing Aerospace, where he worked on many aerospace engineering projects such as the Saturn 5 program, the design team for the lunar rover (the moon buggy) that was used to transport astronauts on the moon and on military weapons design. Survivors: five children, three grandchildren and one great-grandchild.

**JAMES HUGH LITTLE** BSCE'53, Jefferson City, Missouri, November 4. He served in the U.S. Army from 1954 to 1956. Later, he was awarded a fellowship from the Automotive Safety Foundation to undertake graduate studies at Yale University. He was a member of the Missouri Professional Engineers where he was name Outstanding Young Engineer of the Year in 1963. Survivors: his sister and many nieces and nephews.

**JOHN KAISER II** BSEE'54, Seattle, Washington, July 27. He worked for Boeing for more than 40 years as an electronic engineer where he then retired.

**ED ALBRITTON** BSAGE'55, Junction City, Louisiana, November 8. He worked for many years in Soil Conservation before accepting a position in Victoria with Wesson Farms. He was instrumental in their catfish farming operation. In 1988, he accepted a position with the drainage district manager from which he retired in 2011. Survivors: his wife, Sue, three daughters, five grandchildren and three great-grandchildren.

**MAX KOPP** BSEE'57, Van Nuys, California, May 17, 2014. He served in the U.S. Navy and U.S. Air Force Arkansas Air National Guard. In 1968 he co-founded Validyne Engineering Corporation where he retired as president in 2012. Survivors: three children, 13 grandchildren and 19 great-grandchildren.

**GERALD W. ANDREWS** BSIE'58, The Villages, Florida, January 6, 2013. He worked as a professional industrial engineer and was a Korean War veteran. Survivors: wife, Dorthy, one son, two daughters, six grandchildren and six great-grandchildren.

## 1960

**JOHNNY F. MCDANIEL** BSME'61, Germantown, Tennessee, July 22. He served 28 years as a pilot in the U.S. Air Force, having flown over 13,000 hours at the time of his retirement. After retirement he worked as a defense contractor and C-141 simulation instructor. Survivors: his wife of 55 years, Rita, four sons, nine grandchildren and two great-grandchildren.

**CECIL C. GENTRY JR.** BSIE'61 MSME'65, Bartlesville, Oklahoma, October 9. He was a Registered Professional Engineer in Oklahoma and spent the last 28 years of his career at Philips Petroleum Company, retiring as manager, Heat Transfer and Fluid Mechanics. Survivors: wife of 54 years and two sons, Mark Cecil Gentry BSME'93 and Matt Calvin Gentry BSME'90.

**MINOR ROSS JENKINS** II BSEE'63, Montgomery, Alabama, July 13. He served in the U.S. Army. Survivors: three children and four granddaughters.

**JIM D. FANT** BSIE'65, Roland, Oklahoma. Fant was in his 11th year of teaching at Heavener. He was a math and credit recovery teacher.

**JAMES H. SHIELDS III** BSIE'67 MSIE'71, Fort Smith, November 14. He was a successful businessman with his work in Estee Lauder, Revlon, and Bausch and Lomb. Shields served in the U.S. Army calvary, here and in Germany. He achieved rank of First Lieutenant. Survivors: wife, Sarah Shields, one son, James Homer Shields IV, two granddaughters and one sister.

**BILLY DON BROWN** BSEE'67, Little Rock, December 29, 2015. He served his country in the Vietnam War as a Missile Technician Third Class on several Navy submarines from 1967 to 1969. He was a former mathematics instructor for the Bald Knob and Maynard, Arkansas, school systems and a retired maintenance electrician for the companies Genstar and Wheatland Tube and Conduit in Little Rock. Survivors: His wife Alma, two sons and two sisters.

**CLOYSE A. RITCHEY** BSEE'68, Little Rock, September 8. He was a captain and fighter pilot in the U.S. Air Force where he served two tours in Vietnam. Survivors: five children and seven grandchildren.

**JIM DYER** BSEE'68, Huntsville, August 27. He was a computer programmer and served in the U.S. Navy in the Vietnam Era. Survivors: his wife, Dorothy, two sons, two step-sons and eight grandchildren.

## 1970

**THOMAS D. WILLIAMS** BSEE'75, Hot Springs, October 3. He was a manager of engineering and maintenance at Reynolds Package Rolling Mill. He loved spending time with his family and participating in outdoor activities. Survivors: his wife, Glenda, two daughters, two grandsons, one brother and one sister.

**NIALL O'SHAUGHNESSY** BSCE'78 MSCE'81, Little Rock, Arkansas, 59 passed away September 16 after a battle with brain cancer. He was a six-time All-American while competing in three sports for the Razorbacks. He was inducted in the University Of Arkansas Hall Of Honor in 1994. He is survived by his loving wife, two sons, mother, brothers, and sisters.

## 1980

**JIM COLEMAN** BSIE'80, Rogers, September 10. He worked for 30 years at for Preformed Line Products in Rogers. He proudly served his country in the U.S. Army, earning the rank of SP4 and completing a tour in Vietnam. Survivors: three children and three granddaughters.

**DONALD JAMES WINNIKE** BSME'80, Sycamore, Illinois, October 26. He served his country proudly in the U.S. Navy during the Vietnam War. He was later employed for many years as a mechanical engineer in research and development. Survivors: his two children and his two grandchildren.

**CHARLES D. ENGSTROM** BSCE'81, Sherwood, August 26. He was a structural engineer in his cousin's firm, H. James Engstrom and Associates, Inc. for more 35 years. Survivor: one daughter.

**ROBERT LEE ROBINETTE** BSEE'89, Maumelle, November 18. He was a Master Electrician, Registered Professional Engineer and past President of the Electrical League of Arkansas. During his 26 years he was supervisor of meter services at the Baseline Service Center, he was manager of wholesale business for Entergy Arkansas and also worked as an engineer and an industrial account representative. Survivors: his parents, brother, grandmother, niece and fiancée.

## 1990

**WILLIAM E. COYLE** MS'91, Hilliard, Ohio, November 24. He worked in manufacturing throughout his career, most recently as a logistics manager for L'Oreal USA. He served on the board of Apics and taught certification classes.

Survivors: his wife of 36 years, Deb, his mother, brother and sister.

**DAMON J. BREWER**, Springdale, October 15. Survivors: wife, April, one daughter, his parents, one sister, one brother and many nieces and nephews.

## 2000

**RENALDO JEREMIAH HEMPHILL** MS'01 PHD'07, Pine Bluff, July 5. Survivors: his parents and two siblings.

**JAMES JEFFREY ANDERSON** MSOM'06, Fort Hood, Texas, September 9. In 1992 Anderson enlisted in the U.S. Army where he served as a cannon crewmember in the field artillery. He was separated as an enlisted man from active duty on June 6, 1994 with an appointment to the U.S. Military Academy at West Point. Upon graduation he was commissioned a Second Lieutenant in the field artillery. Within a few months, he was recommissioned as a Major in the Army. Survivors: wife, Farasat, mother, father, daughter, son, grandmother, two sisters and two brothers.

## 2010

**ROBERT CHAMP WILLIAMS** MSOM'11, Fort Smith, November 6.

**STEVEN FURSETH** MSOM'13, Munford, Tennessee, August 10, 2014. Survivors: his wife, Rebecca, one daughter, three sons and one grandchild.

## Friends

**ROBERT E. BAKER**, Springdale, August 2. He was a retired computer technician. He enjoyed working on the computer, reading, watching movies, fishing, cooking and having serious debates on various topics. Survivors: his wife, Tammy and one son.

**Have a Class Note?**  
Send your news to  
[records@arkansasalumni.org](mailto:records@arkansasalumni.org)





The University of Arkansas College of Engineering announces its 2016

# *Alumni Award*

## HONOREES

### HALL of FAME

Troy Alley, Jr., BSEE '69

David Foust, BSIE '64

Stanley Reed\* BSAGE '73, JD '76

### DISTINGUISHED ALUMNI

Sharon Booth McGee, BSChE '87, MSChE '88

David Humphrey, BSIE '82, MSIE '83

Michael Jones, BSAGE '67, MSAGE '68

Jerry Martin, BSCE '67, MSCE '68

Jack Murders, BSME '86

Joseph Roblee, BSCSE '90

John Michael Russ, BSEE '73

### EARLY CAREER

Keith Britton, BSCE '97, MSCE '99

Dr. Jared Hornberger, BSEE '02, MSEE '04, Ph.D. '12

Steven Karp, BSCSE '99

Matthew Loach, BSChE '96

Kevin Oden, BSIE '07, MBA '11

Dr. Chris Pixley, BSBAE '02, Ph.D. '13

\*POSTHUMOUS