Annual Review 2021-2022

UNIVERSITY OF ARKANSAS

College of Engineering
Industrial Engineering

UNIVERSITY OF ARKANSAS

College of Engineering
Industrial Engineering

Producing Leaders That Will Solve Tomorrow's Engineering Challenges

DEPARTMENT HEAD WELCOME

Coming off of a few very challenging years, I am thankful that we are seeing pre-pandemic normalcy in many areas. Students are studying abroad, the hallways of Bell and White Engineering are filled with energy and excitement, new research areas are emerging and we have been able to connect with colleagues from across the nation at a variety of conferences.

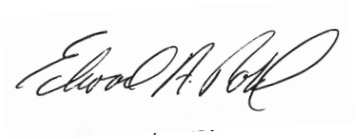
Perhaps one of the most noteworthy moments of the year was our successful search endeavor for two new faculty members. We are fortunate to have Brandon Crisel, instructor and Alan Vazquez, assistant professor, joining our team this fall. Brandon comes to us from the First-Year Engineering program in the College of Engineering, so he will be a familiar face to many of our students. Alan is coming to us after serving as an assistant adjunct professor at UCLA. You will learn more about them in this report and I am confident you will hear about their accolades and contributions to the department in future reports too.

In terms of student success, I would be remiss to not mention Coleman Warren. Coleman is a spectacular student whose honors include being the only University of Arkansas undergraduate student to have ever been recognized as both a Truman Scholar and a Rhodes Scholar. Coleman was also named the Industrial Engineering Outstanding Senior, the College of Engineering Outstanding Senior and one of two students recognized with the 2022 Senior Honor citation which recognizes the top two seniors on campus. He also served the university as its 100th student body president while double majoring in Industrial Engineering and Political Science. As if that wasn't enough, he is the founder and CEO of Simple + Sweet Creamery, which has won several start-up competitions and was even featured on Good Morning America. Remember his name; I am certain you will hear it in the future!

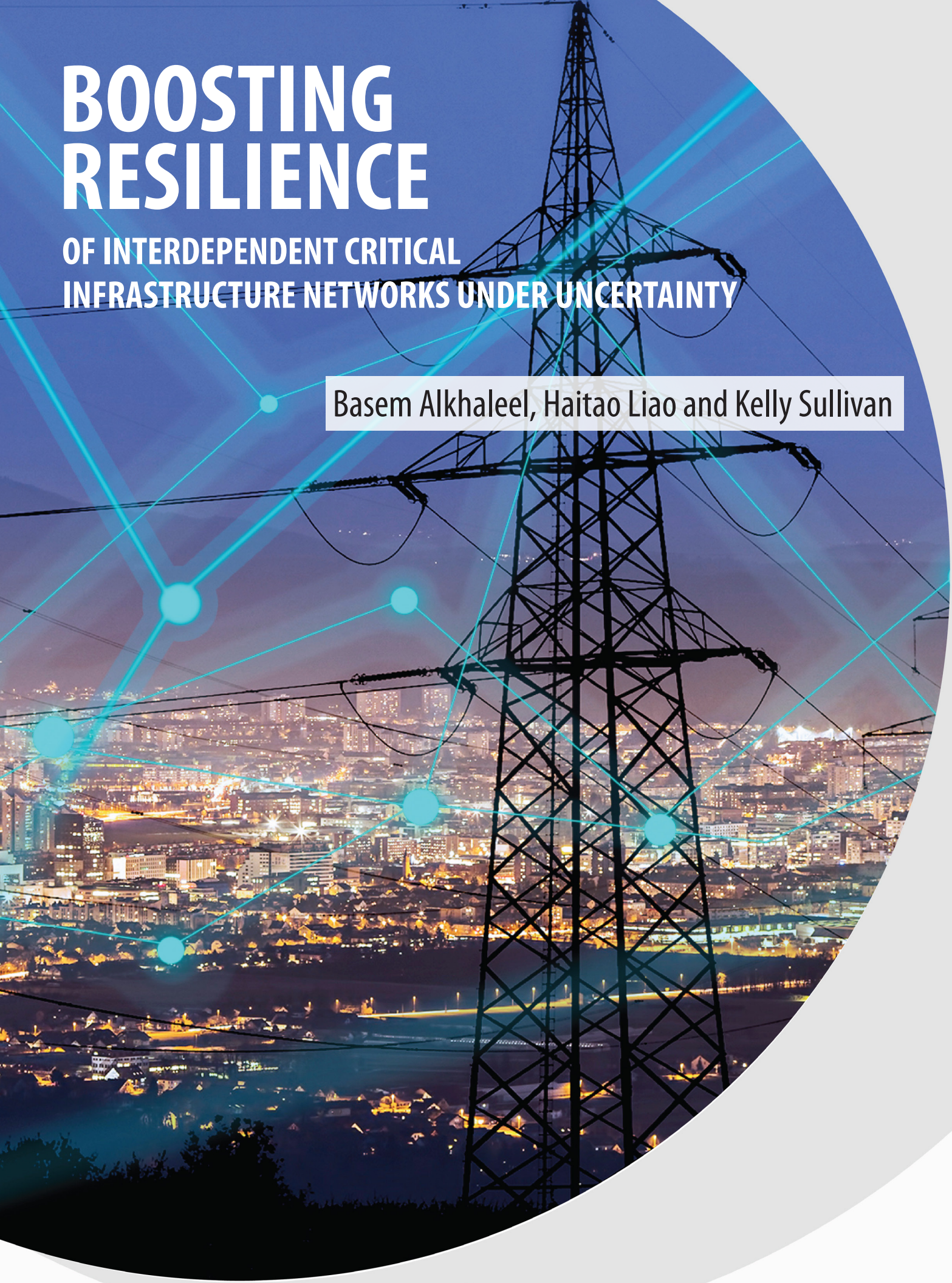
Our faculty, students and staff were able to travel to the Institute of Industrial and Systems Engineers conference in Seattle this May for the first time in two years. At the conference, Sandra Ekşioğlu was inducted as an IISE Fellow, bringing our total number of IISE fellows to nine. Relative to the number of faculty we have, nine fellows is quite significant! Also at IISE, rising senior Abby Harris received the UPS Scholarship for Female Students and graduate student Hieu Bui received a best paper award for his paper, "Toolpath planning for multi-gantry additive manufacturing." Overall, it was a great conference!

We remain committed to providing a quality experience to our students. This has become even more evident in recent years as new challenges have faced us. We would not be where we are today without the support of our dedicated alumni and friends. I am very proud of where we are today and I hope you enjoy this report which highlights many of our successes!

All my best,



Department Head and 21st Century Professor
of Industrial Engineering



BOOSTING RESILIENCE

OF INTERDEPENDENT CRITICAL INFRASTRUCTURE NETWORKS UNDER UNCERTAINTY

Basem Alkhaleel, Haitao Liao and Kelly Sullivan

Critical infrastructure networks (CINs) for electric power, water distribution, natural gas, transportation, and telecommunications are the backbone of modern societies. However, components in these networks are often vulnerable to disruptive events such as technical accidents, malevolent attacks and natural disasters. These disruptions can reduce overall performance and potentially prevent the networks from providing critical services to society. Therefore, it is of interest to improve the resilience of CINs both by identifying and addressing vulnerabilities before a disruption has occurred and restoring the required services as quickly as possible after the occurrence of a disruption.

Working with Basem Alkhaleel, 2021 doctoral graduate; Haitao Liao and Kelly Sullivan are researching optimization models for post-disruption restoration of CINs. These optimization models assign and schedule components for repair by available work crews to maximize a network resilience metric with the goal of quickly reestablishing the network's ability to deliver services to users. The models expand upon prior research by incorporating uncertainty in the travel time of repair crews and the time required for repair. Alkahleel, Liao and Sullivan formulate both risk-averse and risk-neutral versions of the problem as stochastic optimization models and implement a wait-and-see solution methodology and a Benders decomposition methodology to solve these models. They validate these models by solving hypothetical test cases using network topology data from the French electrical power network. They demonstrate that the risk-averse model consistently outperforms available deterministic models with regard to resilience with high probability.

Since their initial work, Alkhaleel, Liao and Sullivan have also expanded the optimization model for the purposes of planning restoration of interdependent CINs in which one or more of the networks cannot function without the support of the others. They develop a two-stage mean-risk stochastic restoration model with the goal of minimizing the total cost associated with unsatisfied demands, repair tasks and flow of interdependent CINs. The team demonstrates the model's capabilities using the water and power networks in Shelby County, TN, under two hypothetical earthquake scenarios. One of their important findings is that the mean-risk stochastic models significantly outperform the deterministic counterparts based on the positive mean-risk value of stochastic solution under all test cases.

This work was sponsored by the U.S. National Science Foundation under Grant No. CMMI-1745353 and OIA-2119691. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.[1]

[1] The outcomes of this work are published in the European Journal on Operational Research and Computers & Operations Research.

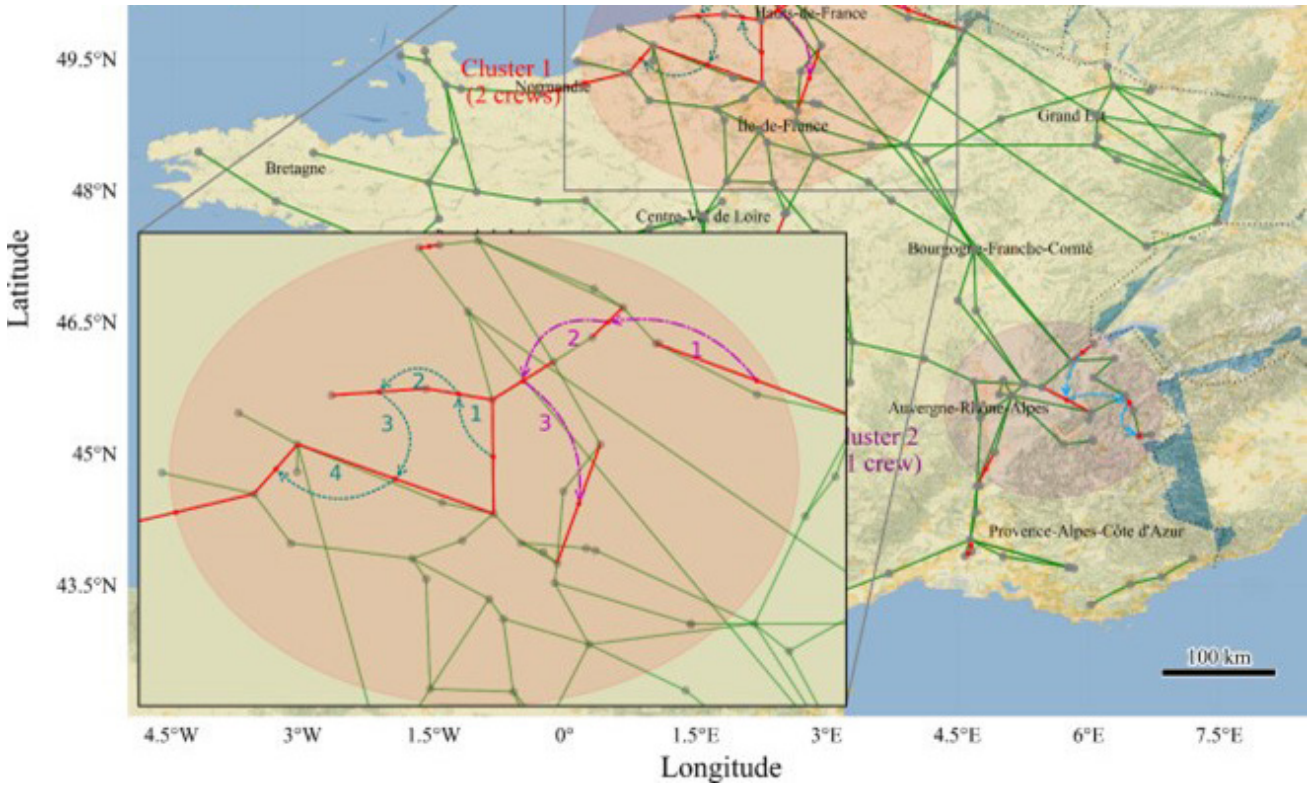
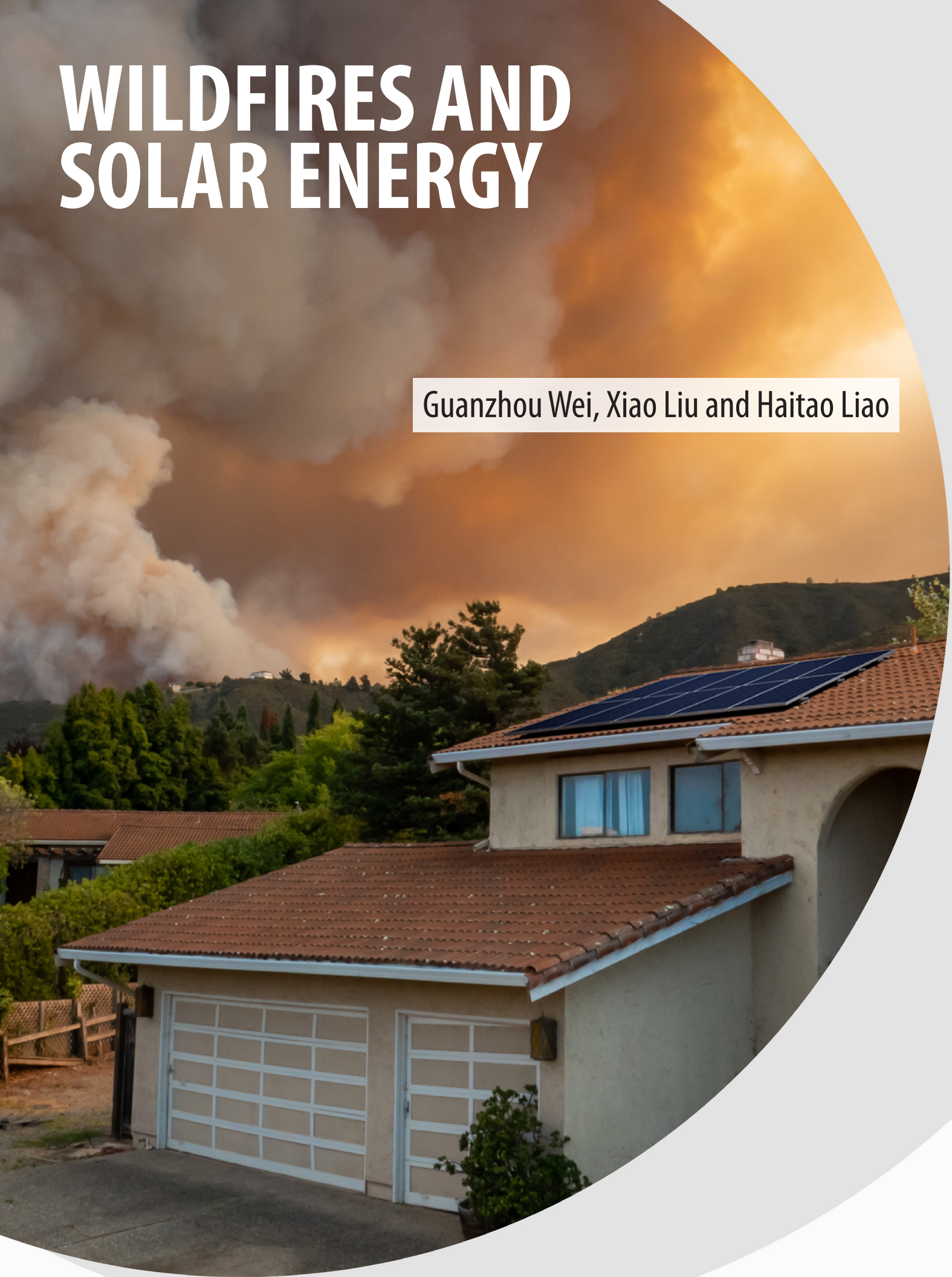


Illustration of restoration model output for a test case using topology data from the French electrical power network.[1]

WILDFIRES AND SOLAR ENERGY

Guanzhou Wei, Xiao Liu and Haitao Liao



The increasingly severe wildfires have significantly affected solar energy production in the United States. In recent years. Although the installed solar generating capacity in California was increased by 5.3% from September 2019 to June 2020, solar power generation in the first two weeks of September 2020 was 13.4% lower than at the same time a year earlier. Atmospheric aerosols generated by wildfires blocked the incoming solar radiation and were deposited on solar panel surfaces, reducing the received solar energy from photovoltaics.

In atmospheric science, aerosols are solid or semi-solid particles, such as PM2.5 in the atmosphere, and produced by environmental disasters including volcanic eruptions, biomass burning, wildfires, etc. As shown in Figure 1, the average daily solar generation in the California Independent System Operator (which covers 90% of utility-scale solar capacity in California) declined nearly 30% from the July 2020 average as wildfires burned across the state in the first two weeks of September 2020. This trend is consistent with the elevated PM2.5 level over the same period as shown in the lower portion of Figure 1.

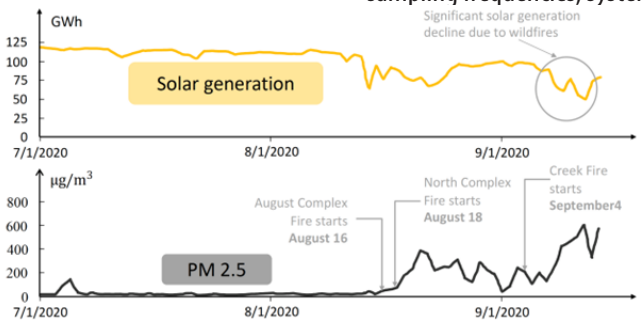


Figure 1 Daily California Independent System Operator solar generation (above) and peak air particulate matter level (bottom) (source: York, S. 2020. U.S. Energy Information Administration. https://www.eia.gov/todayinenergy/detail.php?id=45336)

Atmospheric aerosols are measured by Aerosol Optical Depth (AOD) the aerosols distributed within a column of air from the Earth's surface to the top of the atmosphere. AOD measurement data streams can be retrieved from multiple geostationary remote-sensing satellites, enabling the real-time modeling and short-term prediction of AOD processes. For example, the Advanced Baseline Imager (ABI) on board the National Oceanic and Atmospheric Administration's GOES-16 and GOES-17 satellites both generate remote-sensing AOD images for the continental U.S. (CONUS) every 5 minutes. Figure 2 shows the observed AOD from both GOES-16 and GOES-17 at 2020-10-01-18:03 over the West Coast. It is critical to note that, although the two images are taken at the same time over the same spatial area for the same underlying process, the two images present very heterogeneous characteristics. For example, (i) the data missing rates are clearly different from the two data streams (the white spaces correspond to the areas over which no measurements are available). Even the measured AOD values can be different. In the Northwest portions of these two images, GOES-16 (on the left) clearly shows much lower AOD readings than GOES-17 (on the right). In this example, GOES-16 fails to see the wildfire burning in the Northwest region of the image.

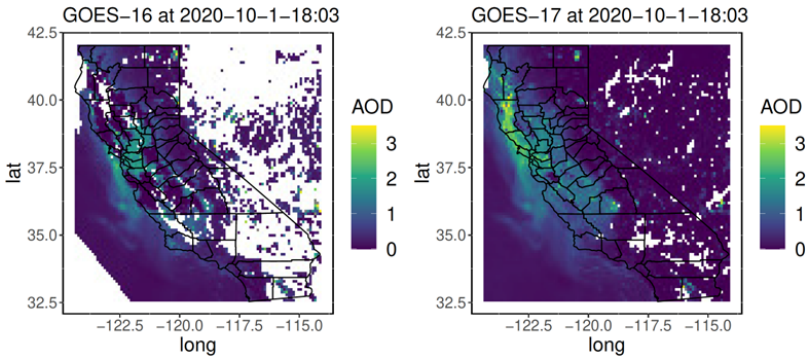


Figure 2 AOD images (taken at the same time over the same spatial area) from GOES-16 and GOES-17 geostationary satellites, where the heterogeneity between the two images is clearly visible (e.g., data missing rates and AOD readings)

In fact, heterogeneity among multi-source data streams is a very common issue in optical remote-sensing (e.g., data missing rate, sampling frequencies, systematic bias, measurement errors, etc.). Remote-sensing data streams are noisy and potentially biased observations of an underlying physical process. To accurately estimate and predict the underlying AOD propagation process, there exist practical needs and theoretical interests to propose a physics-informed statistical approach for modeling wildfire AOD propagation by simultaneously utilizing, or fusing, multi-source heterogeneous satellite remote-sensing data streams. Leveraging a spectral approach, the proposed approach integrates multi-source satellite data streams with a fundamental advection-diffusion equation that governs the AOD propagation process. A bias correction process is included in the statistical model to account for the bias of the physics model and the truncation error of the Fourier series. The proposed approach is applied to California wildfires AOD data streams obtained from the National Oceanic and Atmospheric Administration. Comprehensive numerical examples are provided to demonstrate the predictive capabilities and model interpretability of the proposed approach.

This is the work of doctoral student, Guanzhou Wei. Much of the work was completed through collaboration with the National Renewable Energy Lab. The preliminary work, with Haitao Liao and Xiao Liu, who advise Wei, received the Best Paper Award (Application Track) at the 16th INFORMS Workshop on Data Mining and Decision Analytics, 2021 INFORMS Annual Meeting, Anaheim, CA (https://connect.informs.org/data-mining/awards/prize/new-item222758667). Wei and Xiao Liu are currently collaborating with the Argonne National Lab, to better understand the interaction among wildfires, energy systems and power grid resilience.

OUR RESEARCH

The Department of Industrial Engineering at the University of Arkansas has a longstanding tradition of conducting leading-edge research in all areas of industrial engineering.

- Reliability, Maintainability, and Quality Engineering
- Transportation, Logistics, and Distribution
- Healthcare Systems Engineering
- Engineering Management
- Big Data and Data Analytics

A special emphasis of our research has been in the area of quantitative modeling and analysis of transportation and logistics systems through our major research centers.

This synergistic research takes advantage of our unique access to major organizations with world-class logistics and distribution operations.

Our research has:

- changed business practices in order to simultaneously lower inventories and reduce stock-outs;
- designed next-generation distribution centers;
- developed new global identification standards;
- optimized the design of global supply chains to improve their efficiency and resilience to disruption events.

Our research is supported by the following centers

CELDi
Center for Excellence in Logistics and Distribution

The mission of CELDi is to enable member organizations to achieve logistics and distribution excellence by delivering meaningful, innovative and implementable solutions that provide a return on investment. Research activities, graduate and undergraduate course offering, professional development and continuing education opportunities combine to form the foundation and structure for educating the next generation of engineers in logistics and distribution centers.

MACK-BLACKWELL
Transportation Center

The Mack-Blackwell Transportation Center (MBTC) has led a U.S. Department of Transportation University Transportation Center since 1992. MBTC builds on its geographic access to road, river and rail corridors and industry access to global logistics leaders (including Walmart, J.B. Hunt Transport and ABF Freight Systems) to lead nationally relevant multimodal research to carry people and freight to their destinations efficiently and effectively. MBTC works closely with the Arkansas Department of Transportation and many other transportation stakeholders across the nation. MBTC has managed transportation research subcontracts at fifteen other universities in thirteen states.

ASCENT
Arkansas Security Research and Education Institute

The role of the Arkansas Security Research and Education Institute is to bring important practical security problems to the most talented University of Arkansas' researchers, to recruit industry members to sustain the institute and provide research and educational vision, to assist institute's researchers in pursuing competitive research funding and to facilitate improving the security education at the University of Arkansas.

The Maritime Transportation Research and Education Center (MarTREC) is a USDOT Tier 1 University Transportation Center funded through the Office of the Assistant Secretary for Research and Technology, and initially funded under Map21. Through continued funding under the FAST Act, MarTREC is working to preserve the Nation's transportation system through efficient, resilient and sustainable maritime and multimodal logistics and infrastructure. Our vision is to be recognized as the Nation's premier source for expertise on maritime and multimodal transportation research and education.

MarTREC
Maritime Transportation Research & Education Center

The System Design and Analytics Laboratory helps research sponsors define and achieve their strategic objectives by developing innovative systems engineering, decision & risk analysis and trade-off analytics methods to identify promising opportunities and create high value solutions with acceptable risk. Our researchers have made significant contributions to the agile development of integrated performance, cost and schedule modeling and quantitative Set-Based Design.

The J.B. Hunt Innovation Center of Excellence (ICE) workspace supports innovative research in logistics, technology and business solutions. The work was supported by a grant from J.B. Hunt in 2017. The efforts of the center are led by faculty and student collaborators from the College of Engineering and the Sam M. Walton College of Business (WCOB) in partnership with J.B. Hunt professionals.

J.B. HUNT
INNOVATION CENTER
OF EXCELLENCE

Donald W. Reynolds Razorback Stadium

DEPARTMENT NEWS

Richard Cassady, university professor and director of the First-Year Engineering Program, was recently inducted to the Academy of Distinguished Alumni for the Grado Department of Industrial and Systems Engineering at Virginia Tech.

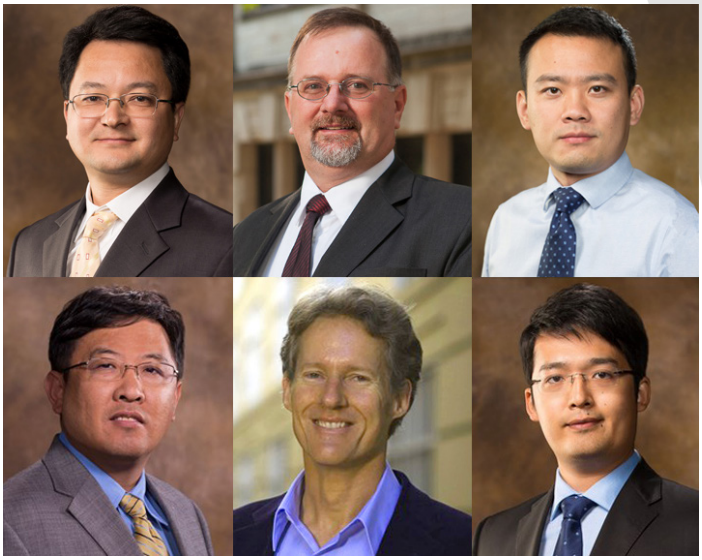
Cassady has served on the industrial engineering faculty since 2000. He received his Bachelor of Science summa cum laude in 1992 and his doctoral degree in 1996, both from Virginia Tech.

Cassady also recently accepted a three-year term as the co-director of the The Wally Cordes Teaching and Faculty Support Center at the University of Arkansas.

Sandra Ekşioğlu, the Hefley Professor in Logistics and Entrepreneurship, was awarded the title of Fellow of the Institute of Industrial and Systems Engineers.

A member since 2004, Ekşioğlu has served the organization in numerous roles from co-chairing individual tracks to her service in a three-year rotation as president-elect, president and past president of the Operations Research Division. In 2016, she and her colleagues established the Energy Systems Division, where she served as a board member for two years. She continued to support the division by co-chairing the Energy Systems track and chairing the student paper competition. In 2018, she chaired the institute's Pritsker Doctoral Award committee. Ekşioğlu is also a member of the American Society for Engineering Education and the Institute for Operations Research and the Management Sciences. She joined the I.E. faculty in 2019.

Sandra was also named as a 2021-22 SEC Academic Leadership Development Program Fellow in December of 2021.



University of Arkansas team includes industrial engineering faculty members: Haitao Liao, Ed Pohl and Xiao Liu and members from electrical engineering: Xintao Wu, Roy McCann and Yue Zhao.

A multi-disciplinary team of researchers from the College of Engineering were the recipients of a National Science Foundation grant to study the use of AI to improve sustainable energy infrastructure networks. The ultimate goal of the $1.45 grant is to establish a collaborative research and workforce development/education program. This four-year multi-institution, multidisciplinary project, worth $6 million in total, will be led by North Dakota State University and the University of Arkansas, with other collaborators from University of Nevada-Las Vegas and Nueta Hidatsa Sahnish College in New Town, North Dakota.

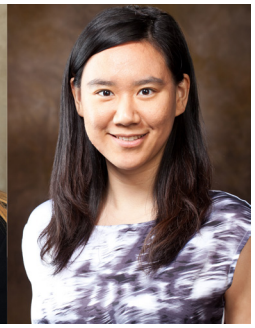
Ashlea Milburn and Kelly Sullivan were inducted to The Teaching Academy of the University of Arkansas in January of 2022. The Teaching Academy

is a society committed to excellence in teaching at the University of Arkansas. It was established in 1988 by Dan Ferritor, former chancellor of the University of Arkansas. The Academy's mission is to advocate and represent teaching interests, promote and stimulate an environment of teaching and learning excellence, and encourage recognition and reward for exceptional teaching.

Each year, the Office of Nationally Competitive Awards at the U of A has a reception honoring finalists of competitive scholarships at the state or national level. In addition, they honor faculty who have been pivotal to students applying for these types of awards with a Faculty Gold Medal, as well as a department that has had great success with students receiving national acclaim with a Departmental Gold Medal.

This year, Ashlea Milburn, associate professor, received the Gold Medal in recognition of the many Student Undergraduate Research Fellowship (SURF) applicants she has mentored over the years. Milburn was adviser to Coleman Warren, Truman and Rhodes Scholar.

The Department of Industrial Engineering received the Departmental Gold Medal in honor of the great success throughout the years with students receiving competitive awards. In addition, several of the faculty are extremely proactive in encouraging students to pursue these types of opportunities.



Ashlea Milburn and Shengfan Zhang were named to the inaugural cohort of the Women's Leadership Exploration Program launched by the UA ENGAGE initiative. The program aims to increase the engagement of women faculty in leadership roles across the University of Arkansas. During four sessions, over a period of three months, the cohort-based program used a flexible flipped classroom model with pre-work (readings, videos) as preparation for the face-to-face sessions. These sessions consisted of discussions with peers, panels with women in leadership roles, as well as talks by experts. Session participants engaged with various women leaders on campus including the College of Engineering dean, Kim LaScola Needy.

"We were so pleased to see the enthusiasm from the program participants," said Needy. "Clearly this program is needed and will help our campus take an important step towards preparing more women leaders."

Greg Parnell, professor of practice and director of the M.S. in Operations Management and M.S. in Engineering Management programs, was the recipient of the 2022 Geren-Koski award for excellence in graduate education. The award is given by the U of A Graduate School and International Education (GSIE) to faculty members who demonstrate exceptional commitment to graduate education. It was initiated in 2010 in honor of Collis R. Geren, who served as dean of the GSIE for nearly 20 years and renamed in 2022 to honor Pat R. Koski, who served as dean and associate dean for 25 years.

Parnell has actively grown the Operations Management and Engineering Management programs over the last seven years as well as recruited and mentored multiple students to the Industrial Engineering doctoral program.

"Dr. Parnell was nominated by several of his colleagues who highlighted his innovative thinking in growing graduate enrollment and supporting students," said Curt Rom, interim dean for the Graduate School and International Education. "Greg is a prolific researcher, mentor and provides engaging advising to his students that change the trajectory of their careers and their lives through his program."

Ed Pohl, professor and department head, was awarded the 2021 J. Steinhardt Prize from the Institute for Operations Research and the Management Sciences in October of 2021. The J. Steinhardt Prize is sponsored by the CNA Corporation and is awarded for outstanding contributions to military operations research and honors a person's life work. The selection committee is composed of previous award winners. The award is accompanied by a plaque and a $2,000 honorarium.

"It's wonderful for Dr. Pohl to receive this well-deserved recognition for research and service over his lifetime to help our military protect the freedoms we enjoy," said Kim Needy, dean. "We are fortunate to have his outstanding leadership and expertise in educating future industrial engineers who will help continue this important legacy."

Also, in February of 2022, Pohl was announced as the editor-in-chief of the *Military Operations Research Society Journal*. The journal publishes

articles that describe operations research methodologies and theories used in key military and national security applications.

Karl Schubert, professor of practice and associate director of the University of Arkansas' multidisciplinary data science program, was recently nominated by Thomas Carter, the assistant dean for academics and student affairs, to join the National Association of Multicultural Engineering Program Advocates, also called NAMEPA.

NAMEPA is the nation's leading community of change agents cultivating diversity, access, equity and inclusion in engineering. NAMEPA is a network of university administrators, faculty, deans, pre-college educators and industry professionals committed to implementing programs, policies and institutional changes to broaden participation in the STEM fields of science, technology, engineering and mathematics.

"I am truly honored and appreciate the opportunity to contribute to an exceptional team that is leading change," said Schubert. "I am also honored to represent NAMEPA on the Carpentries Equity Council this year."

Also, in March of 2022, Schubert was elected to senior member status with the Institute of Electrical and Electronics Engineers.

Eric Specking, assistant dean of enrollment and retention in the College of Engineering and I.E. instructor, has been recognized by the U of A Honors College for outstanding support to honors students. "Under Specking's leadership in recruitment, the College of Engineering continues to enroll a stellar cohort of new honors students each year. He has also played an important role in the prestigious fellowship selection process, serving as both an application reviewer and an interviewer for many years now. We sincerely appreciate Eric for the energy and passion he brings to his job, especially when it comes to recruiting outstanding engineering honors students to the university," said Noah Pittman, assistant dean of enrollment at the Honors College.

The Wally Cordes Teaching and Faculty Support Center hosts the monthly *Conversations with Colleagues* event. At the informal events faculty members from across the University of Arkansas share conversations about teaching and learning with the campus community. In April 2022, Tish Pohl, teaching associate professor was the featured speaker.

Pohl shared studies that show 85% of students indicated they had academic performance effects because of lockdown, isolation and online instruction. As adviser to the over 200 undergraduate students in the industrial engineering program, she is uniquely positioned to discuss the affects of the pandemic on the undergraduate population. In addition to academic influences, they also experienced mental health issues. Some of the struggles identified included depression and anxiety, financial stresses and concern for their health and that of family members.

During the question-and-answer segment of the presentation, topics centered on what others have found that works for their students. Some of the suggestions included: multiple choice questions, smaller point quotas for questions, flipped classroom with more activities and a shorter lecture, or a video lecture that they could view when they had time and could rewind to catch things they may have missed.

Established in 1992, the Wally Cordes Teaching and Faculty Support Center serves as an interactive resource for faculty to enhance teaching and learning. An interesting feature of the Wally Cordes Chair: Conversations with Colleagues events, is the 'traveling rocking chair'. Dr. Cordes kept a rocking chair in his office for his students to occupy during visits. The chair now travels the campus and stays with the speaker of the month.

Taha Publishes 50th Anniversary Edition of 'Operations Research'

Hamdy Taha, emeritus professor of industrial engineering, has published the 50th anniversary edition of *Operations Research: An Introduction*. Since its inception in 1971 and now in its 11th edition, the textbook has been widely adopted by academic institutions in the U.S. and around the world.

The book introduces and teaches operations research basics, focusing on the algorithmic and practical implementation of operations research techniques. The goal is to optimize the decision-making process in a multitude of operational environments, particularly industry and business.

The latest edition introduces the new decision-making algorithms of analytics, machine learning and artificial intelligence.

"I personally taught from earlier editions of Operations Research and can attest to its excellence," said Heather Nachtmann, professor of industrial engineering and associate dean for research in the College of Engineering. "Dr. Taha has a rich history at the U of A and among our industrial engineering and operations research communities. We are very proud to call him one of our own."

Taha joined the Department of Industrial Engineering in 1969 and has been a popular professor throughout his career. He retired in 2002 and remains involved with the department, which he calls his "adopted family."

"Dr. Taha is a legend in our department," said Ed Pohl, professor and chair of industrial engineering. "Many alumni speak so fondly of their experience in Dr. Taha's operations research class. While on our faculty, Dr. Taha won many awards for his teaching, including the university's top teaching award. It is no surprise that his textbook, which reflects his approach to teaching the subject, has been used by so many and for so long. We are extremely proud of Dr. Taha."

Taha was a Senior Fulbright Scholar to Carlos III University in Madrid, Spain. He received the Alumni Award for Excellence in Research and the Nadine Baum Faculty Teaching Award, both from the U of A and numerous other research and teaching awards from the College of Engineering.

Taha's textbook has been translated into 10 languages: Spanish, Chinese, Russian, Japanese, Greek, Portuguese, Korean, Farsi, Turkish and Indonesian. His peer-refereed technical articles have appeared in *Management Science*, *Operations Research*, *Interfaces*, *Naval Research Logistics*, *European Journal of Operations Research*, *IEEE Transactions*, *AAIE Journal and Simulation*. He has also authored three other books and several book chapters.

Fluent in three languages, Taha has also held academic positions at Universidad de las Américas in Mexico and Cairo University in Egypt. In 2003, he was inducted into the Arkansas Academy of Industrial Engineering as an honorary member. His son, Tarek, is a graduate of the U of A Department of Industrial Engineering and former president of the Arkansas Academy of Industrial Engineering.

In addition to his teaching and research accolades, Taha was loved by generations of students. "As I meet with former industrial engineering alumni, many fondly recall Dr. Taha as one of their favorite teachers," said Kim Needy, dean of the College of Engineering. "They remember his course as tough, but useful."

Published by Pearson, *Operations Research: An Introduction*, 11th edition was released March 25, 2022.

FACULTY SERVICE

Carrie Beam

- Committee Member, INFORMS Committee on Practice. (October 1, 2018-Present).
- Committee Chair, 2022 Franz Edelman Award for Achievement in Advanced Analytics, Operations Research and Management Science.
- Chair the 2022 Franz Edelman Competition. (January 2021-December 2021).
- Committee Chair, 2021 Franz Edelman Award for Achievement in Advanced Analytics, Operations Research and Management Science.
- "Empirical Analysis of Organization Quality Specific Immune System Evolution Based on Self-organization Methods", *Engineering Management Journal*, Invited Manuscript Reviewer, International. (December 2021).
- "Evaluation of Lean Six Sigma Readiness Measures: A Case of Indian MSMEs", *Engineering Management Journal*, Invited Manuscript Reviewer. (February 2021).

Richard Cassady

- Advisory Board Member, Farmington (AR) High School Career Academies. (2017-Present).
- Advisory Board Member, Virginia Tech Department of Industrial and Systems Engineering. (2016-2021).
- Board of Advisors, Cabot (AR) High School STEM. (2021-Present).
- Ogden Best Paper Award Judge, Society of Reliability Engineers. (2019-Present).
- Associate Editor, *Journal of Risk and Reliability*, Associate Editor, International. (2005-Present).

Justin Chimka

- Executive Committee Member, American Statistical Association Transportation Statistics Interest Group. (2021-Present)
- *Quality Engineering*, Editorial Board Member. (2019-Present).
- *Economic Quality Control*, Editorial Board Member. (2014-Present).
- *Journal of Risk and Reliability*, Invited Manuscript Reviewer. (2021).

Burak Ekşioğlu

- Committee Chair, INFORMS Prize for Teaching of OR/MS Practice. (January 2021-December 2021).
- *IISE Transactions*, Associate Editor, International. (2017-Present)
- *International Journal of Engineering Business Management*, Editorial Board Member. (2013-Present).
- *The Scientific World Journal*, Editorial Board Member. (2013-Present).
- *Healthcare Management Science*, International. (2019-2021).

Sandra Ekşioğlu

- President, Energy Systems Division of IISE. President-Elect. (June 2021-June 2022).
- President-Elect, Energy, Natural Resources and the Environment Section of INFORMS.
- President-Elect. (Nov2020-Nov2022).
- Chair, Freight Transportation and Logistics, SIG, INFORMS Transportation Science and Logistics (TSL) Society. (2019-2021).
- Past-Chair, Women in Engineering Division, American Society for Engineering Education. (July 2020-July 2022).
- Faculty mentor, Future Faculty Fellows Mentor, IISE. (Nov 2021-Present).
- Cluster Co-chair TSL's "Freight transportation and logistics" cluster, 2021 INFORMS Annual Meeting, Transportation Science & Logistics, INFORMS. (Oct 2021).
- Session Chair, 2021 INFORMS Healthcare Conference. (July 2021).
- Reviewer, Operations Engineering Unsolicited Proposals Review Panel, National Science Foundation (March 2021).
- Member, ASEE Commission on P-12 (Jan 2021-Dec 2021).
- Member, Best Publication Committee, *Optimization Letters Journal* (Nov. 2021).
- *Journal of Cleaner and Circular Bioeconomy*, Associate Editor. (2021-Present)
- *Journal of Cleaner Production*, Editorial Board Member. (2018-Present).
- *Optimization Letters*, Editorial Board Member. (2018-Present).
- *Journal of Energy Systems*, Editorial Board Member. (2013-Present).

Haitao Liao

- External evaluator for faculty P&T, School of Industrial Engineering and Management, Oklahoma State University. (December 2021).
- Proposal reviewer, Kansas NSF EPSCoR First Award Program. (2021).
- Proposal reviewer, Department of Energy Nuclear Engineering University Program. (2021).
- Council Member, At-large Representative for INFORMS Sections, Subdivisions Council. (2020-2021).
- Invited Panelist, INFORMS QSR Student Introduction and Interaction Session. Anaheim, CA. (October 2021).
- Co-organizer, IISE QCRE Best Student Paper Award. (May 2021).
- Session Chair, ISERC - Maintenance Modeling and Logistics. (May 2021)
- *International Journal of Reliability and Safety*, Associate Editor. (2020-Present).
- *IISE Transactions on Quality and Reliability*, Associate Editor. (2017-Present).
- *RAMS*, Associate Editor. (2019-2022)

Xiao Liu

- President-Elect, DAIS, IISE (2021-2022)
- Track Co-Chair, DAIS, IISE Annual Conference and Expo, 2021. (2020-2021).
- Committee Member, Academic Committee, QSR, INFORMS, (2021)
- Committee Member, Research Committee, QSR, INFORMS, (2021)
- Committee Member, Program Committee, IEEE International Conference on Big Data (IEEE Big Data 2021).
- *International Journal of Reliability, Quality and Safety Engineering*, Editorial Board Member. (2020-present).
- *Quality and Reliability Engineering International*, Editorial Board Member (2016-present).

Ashlea Milburn

- Committee Member, Center for Childhood Obesity and Prevention Senior Mentoring Subcommittee. Little Rock, AR. (2021-Present).
- Committee Member, IISE Scholarship Selection Committee. (2021-Present).
- Board Member, *INFORMS Transactions on Education*. (2018-Present).
- Associate Editor, *INFORMS Transactions on Education*. (2018-Present).
- Treasurer, Healthcare Systems Engineering Alliance. (2014-Present).
- Committee Member, IISE Logistics and Supply Chain Division Teaching Award Selection Committee. Review and judge applications for IISE LSC Division Teaching Award. (2021).

Heather Nachtmann

- Editor-in-Chief, *The Engineering Economist*. (2021 - 2024).
- Standing Council Member, National Science Foundation Engineering Research Visioning Alliance (ERVA). (2020-present).
- Engineering Research Council Member, American Society for Engineering Education, (2015-2019, 2021).
- Committee Member, Committee on Scholarly Publications, American Society for Engineering Education. (2021-present).
- Committee Member, Best Dissertation Award Committee, American Society for Engineering Management. (2021).
- Committee Member, Advisory Council for Transportation Research, Arkansas Department of Transportation. (2009 - Present).

Kim Needy

- *Engineering Management Journal*, Associate Editor, 2002-2021.
- Graduate Record Examination, Diversity, Equity and Inclusion Committee, 2017-2021.
- Conference of Southern Graduate Schools, Presidential Rotation 2018-2021.
- Council of Graduate Schools, Math, Physical Sciences and Engineering Dissertation Award Chair 2020-2021.
- Board of Directors for the United Way of Northwest Arkansas, 2019-present; Chair of the Community Impact Committee, 2020-present.
- American Society for Engineering Education Deans' Council, 2020-present.
- American Society for Engineering Education Council of Fellows.
- Institute of Industrial and Systems Engineers Council of Fellows.
- American Society for Engineering Management Council of Fellows.

Greg Parnell

- Committee Member, National Academies of Science, Engineering and Medicine, Committee on Risk Analysis for Nuclear War and Nuclear Terrorism. Committee Member. (January 2021-Present).
- Committee Member, INCOSE Professional Development Portal Task Team. (April 2020-Present).
- Committee Member, INCOSE Policy Management Committee. (March 2020-Present).
- Committee Member, INCOSE Honors & Awards Committee. (February 2020-Present).
- Committee Chair, INCOSE Fellows Committee. (January 1, 2020-Present).
- Co-Chair, INCOSE Decision Analysis Working Group. (January 2017-Present).
- Conference Paper Reviewer, INCOSE International Symposium. (December 2014-Present).
- Board of Advisors, INCOSE Corporate Advisory Board. (2014-Present).
- Committee Member, INCOSE Academic Council. (January 2014-Present).
- Committee Member, *Body of Knowledge and Curriculum to Advance Systems Engineering* (BKCASE) Editorial Committee. Includes *Guide to the Systems Engineering Body of Knowledge* (SEBoK) and *Graduate Reference Curriculum for Systems Engineering* (GRCSE). (2013-Present).
- Member, INCOSE Nominations and Elections Committee. (January 2021-January 2023).
- Chair, NASEM Committee on the Review of Bureau of Safety and Environmental Enforcement Offshore Oil and Gas Operations Inspection Program. National Academies of Science, Engineering and Medicine. (2018-2021).
- Member, INCOSE SE Vision 2035 Review Support Team. Plan, organize and conduct the review of vision documents (July 2020-September 2021).

Ed Pohl

- Editor, *The Journal of Military Operations Research*, MORS January 2022-Present.
- Co-Editor, *Engineering Management Journal*, ASME 2018–January 2022.
- Editorial Board, *Systems*, 2018-Present.
- Editorial Board, *IEEE Transactions on Engineering Management*, 2018–Present.
- Associate Editor, *IEEE Transactions on Reliability*, 2003–2008, 2014-Present.

- Associate Editor, *Journal of Risk and Reliability*, 2005-Present.
- Associate Editor, *Quality Technology & Quantitative Management*, 2012–Present.
- INFORMS Selects Committee, Informs Analytics Conference, Virtual, April 2021.
- ASEM Annual Conference, Virtual, October 2021, Track Chair.
- Board of Directors Reliability and Maintainability Symposium, IISE Representative.
- INFORMS Meeting Committee, 2017-2021.

Tish Pohl

- Director, Industrial Engineering Division, American Society for Engineering Education. (2018-Present).
- Committee Chair, John L. Imhoff Award Committee, American Society for Engineering Education. (2017-2020).
- John L. Imhoff Award Committee, American Society for Engineering Education. Ad Hoc Member for 2021.
- ASEE Annual Conference, Ad Hoc Reviewer. (2014-Present).

Chase Rainwater

- Past-President, IISE Operation Research Division. (2019-2021).
- *European Journal of Operations Research*, Ad Hoc Reviewer. (2021-Present).
- *IIE Transactions*, Invited Manuscript Reviewer. (2018-Present).
- *Computers and Industrial Engineering*, Invited Manuscript Reviewer. (2019).
- *International Journal of Production Research*, Invited Manuscript Reviewer. (2018-Present).
- FIRST Robotics, Mentor & Coach, (2015-Present)

Manuel Rossetti

- Chairperson, Winter Simulation Conference 2024. (2020-Present).
- Fellow, Institute of Industrial Engineers. (2013-Present).
- Member, Operational Research Society. (2007-Present).
- NSF Panelist, SBIR Program, Information Technology Applications. (2006-Present).
- Session Chair, Winter Simulation Conference. (2004-Present).
- Member, American Society for Engineering Education (ASEE). (1999-Present).
- Member, INFORMS College on Simulation. (1999-Present).
- Associate Member, Institute for Operations Research and Management Science (INFORMS). (1988-Present).
- *International Journal of Modeling and Simulation*, Associate Editor. (2000-Present)
- *Journal of Defense Analytics and Logistics*, Editorial Advisory Board. (2016-Present).

Eric Specking

- Connecting with Academia Co-Lead, INCOSE Empowering Women Leaders in Systems Engineering. (2018-Present).
- Committee Member, INCOSE Resilience Working Group. (2017-Present).
- Committee Member, OzarkSTEM. (2017-Present).
- Board of Advisors, Bentonville Public School's Project Lead the Way Advisory Board. (2010-Present).
- Board of Advisors, Fayetteville Public School's Project Lead the Way Advisory Board. (2010-Present).
- Board of Advisors, Springdale Public School's Project Lead the Way Advisory Board. (2010-Present).
- Program Coordinator, ASEE Engineering Management Division. (2021-2022).
- Cluster Co-Chair, INFORMS Decision Analysis Society. (2020-2022).
- Committee Member, ASEE P12 Committee. (2018-2022).
- Treasurer, ASEE Engineering Management Division. (2020-2021).
- Member, ASEE Midwest Regional Conference Planning Committee. (2019-2021).

Kelly Sullivan

- *INFORMS Journal on Computing*, Associate Editor. (January 2019-Present)

Shengfan Zhang

- Primary Track Co-Chair, Health Systems Track, 2022 Institute of Industrial and Systems Engineering (IISE) Annual Conference. (2021).
- Committee Member, INFORMS Committee on Diversity, Equity and Inclusion (DEI). (2021).
- Cluster Co-chair, DEI Cluster, INFORMS Annual Meeting. (2021).
- Past-President, INFORMS Public Sector Operations Research (PSOR). (2021).
- Mentor, INFORMS Mentoring Program. (2021).
- Selection Committee, INFORMS WORMS Award for the Advancement of Women in OR/MS. (September 2021).
- Judge, INFORMS Minority Issues Forum Poster Competition. (September 2021).
- *Health Systems*, Area Editor. (2021).
- *IISE Transactions on Healthcare Systems Engineering*, Associate Editor. (2021).

NEW FACULTY

Brandon Crisel joined the department as an instructor in July 2022. He received his Master's Degree in Industrial Engineering from the University of Arkansas, a Master's Degree in Mathematics with Emphasis in Statistics from Arkansas State University and a Bachelor's Degree in Mathematics from Arkansas State University. His engineering research was in systems reliability, but his continued research has been in improving educational methods and practices, particularly in the STEM fields.

Brandon has received multiple teaching awards such as the inaugural Dean's Non-Tenure Track Teaching Award from the University of Arkansas's College of Engineering and the Departmental Award for Teaching from the First-Year Engineering Program. He is a member of FYEE, ASEE, Alpha Tau Omega and an active FIRST volunteer.

Alan Vazquez joined us as an Assistant Professor in August 2022. He received his PhD in Applied Economics from the University of Antwerp, Belgium. Before joining the University of Arkansas, he was an Assistant Adjunct Professor at the Department of Statistics at the University of California, Los Angeles. He was also a Postdoctoral researcher at the Department of Biosystems at the KU Leuven, Belgium.

Alan's research area is the interface between the fields of statistical design of experiments and operations research. More specifically, he investigates how heuristic and exact algorithms can be used to develop cost-efficient experimental plans to innovate and improve products and processes. His research is featured in high-impact journals such as *Technometrics*, *Journal of Quality Technology* and *European Journal of Operational Research*. Alan has earned numerous travel grants and a Junior Postdoctoral Fellowship from the Flemish Fund for Scientific Research (FWO) in Belgium.

ACTIVE GRANTS

Hernandez, S. and **J. R. Chimka**, "Seat belt, motorcycle helmet and child restraint survey," Sponsored by Arkansas State Police, $300,218.00. (2018 – 2022).

Liu, X. and **J. R. Chimka**, "Random forests for recurrent event analytics," Sponsored by Data Analytics That Are Robust and Trusted (DART), an NSF EPSCoR Research Infrastructure Improvement Program, $249,917.00. (2020 – 2025).

Eksioglu, B. and S. D. Eksioglu "Telehealth: Improving Access to Health Care," UAMS, $8,494 (2021 –2021).

Eksioglu, S. D., "Integrated Process Optimization for Biochemical Conversion," Sponsored by U.S. Department of Energy, Federal, $1,947,383.42. (April 1, 2018 -Aug15, 2022).

Liao, H., E. A. Pohl, X. Liu, Y. Zhao, R. A. McCann and X. Wu, "RII Track-2 FEC: Artificial Intelligence on Sustainable Energy Infrastructure Network (AI SUSTEIN) and Beyond towards Industries of the Future," Sponsored by National Science Foundation, Federal, $1,450,003.00 – Arkansas share. (2021 – 2025).

Liu, X., "From Black-Box to Next-Generation Domain-Aware Data Science – Machine-Learning-Based Investigation of Aircraft-UAS Collision Harnessing the Convergence of Engineering, Computer Science and Mathematics," Chancellor's Innovation and Collaboration Fund, $201,315.00. (2021).

Liu, X., "Smart detection of neutrophil-platelet-NET interactions over time within pulmonary microcirculation following e-cigarette exposure in mice," Sponsored by West Virginia University, Institution of Higher Education, $19,178.00. (2021).

Liu, X., "Integrating System Physics with Sensor Data for Health Prognostics of Complex Engineered Systems," Sponsored by National Science Foundation (NSF), CMMI/OE1904165, $454,465. (2019 – 2022).

Liu, X., "RII Track-4: Harnessing Big Event Data with Heterogeneous Feature: Intelligent Food-Borne Outbreak Investigations and Beyond," Sponsored by National Science Foundation (NSF), OIA1929091, $238,173. (2019 –2022).

Milburn, A. B., "CAREER: Information Accuracy and the Use of Social Data in Planning for Disaster Response," Sponsored by National Science Foundation, Federal, $500,000. (2016 – 2023).

Milburn, A. B., "NSF INTERN Supplemental Funding for CMMI 1554412 CAREER: Information Accuracy and....for Disaster Response," Sponsored by National Science Foundation, Federal, $40,056 (2020 – 2021).

Milburn, A. R., "ACRI -Weber Center for Childhood Obesity Prevention - UAF Senior Milburn Mentor," Sponsored by Arkansas Children's Hospital Research Institute, State, $20,004. (2020 – 2022).

Nachtmann, H., J. D. Cothren, R. Ham and C.E. Rainwater, The Walton Family Charitable Support Foundation, Inc., $412,000, "SMART Mobility Planning Grant," June 2022 – February 2023

Nachtmann, H. and J. D. Cothren, U.S. Department of Agriculture, $95,000, "Interactive Flow Maps for Lock Performance Monitoring System and Waterborne Commerce Data for U.S. Grain and Bulk Commodities," September 2021 – September 2022.

Cothren, J. D., **H. Nachtmann** and 17 other U of A Co-PIs, Arkansas Economic Development Commission, National Science Foundation, $1,994,292, "RII Track-1: Data Analytics that are Robust and Trusted (DART): From Smart Curation to Socially Aware Decision Making," July 2020 – June 2025.

Nachtmann, H., J. D. Cothren, J.R. Chimka and C.E. Rainwater, U.S. Dept of Transportation (USDOT), Maritime Administration, $1,500,000, "Transportation and Maritime Analytics Partnerships Hub (TransMap)," September 2019 – September 2022.

Nachtmann, H. and K. D. Hall, USDOT – FAST Act, $8,468,200 (+$4,234,100 match), "Tier 1 Maritime Transportation Research and Education Center," November 2016 – September 2023.

Parnell, G. S., C. M. Beam, E. A. Pohl and J. Wu, "Engineered Resilient Systems Frameworks and Quantification," Sponsored by Georgia Institute of Technology, Institution of Higher Education, $709,433.00. (2017 – 2021).

Pohl, E. A., K. M. Sullivan and H. Liao, "Science of Test Research Consortium," Sponsored by Macaulay-Brown, Inc., Industry, $551,000.00. (2018 – 2022).

Pohl, E. A., Bob Beitle and C. Sides, National Science Foundation, $249,792, "I-Corps Commercialization STEP (STEM Training in Entrepreneurship Practices)," 2017-2022

Cothren, J. D., **C. E. Rainwater**, H. L. Nachtmann, A. R. Milburn, A. Zajicek, D. J. Adams, J. R. Chimka, J. Zhan, K. Luu, H. Liao, L. Zhang,

Q. Li, K. D. Schubert, S. Zhang, T. H. N. Le, X. Wu, X. Liu, S. Yang and Z. Sha, "EPSCoR Track 1 Data Science | Data Analytics that are Robust and Trusted (DART): From Smart Curation to Socially Aware Decision Making," Sponsored by Arkansas Economic Development Commission, State, $0.00. (2020 – 2025).

Cothren, J. D., C. C. Angel, **C. E. Rainwater**, S. A. Warn and H. Theiss, "Photogrammetry Services, Task Order for CY2022," Sponsored by Sandia National Labs, Federal, $1,050,000.00. (December 10, 2021).

Cothren, J. D., C. C. Angel, **C. E. Rainwater**, S. A. Warn and H. Theiss, "Photogrammetry Services, Task Order for CY2021," Sponsored by Sandia National Labs, Federal, $500,000.00. (2021 – 2022).

Di, J., B. N. Panda, **C. E. Rainwater**, D. R. Thompson and H. A. Mantooth, "Cyber-Centric Multidisciplinary Security Workforce Development," Sponsored by National Science Foundation, Federal, $4,634,626.00. (2019 – 2024).

Di, J., A. H. Nelson, **C. E. Rainwater**, D. R. Thompson and Q. Li, "GAANN: Securing Cognitive Edge Computing for Healthcare," Sponsored by U.S. Department of Education, Federal, $597,000.00. (2018 – 2021).

Thompson, D. R., **C. E. Rainwater**, J. Di, S. C. Ricke and W. -J. Lo, "Student Cross-Training Opportunities for Combining Food and Cybersecurity into an Academic Food Systems Education Program," Sponsored by U.S. Department of Agriculture, Federal, $149,890.00. (2018 – 2021).

Rainwater, C. E., Y. Li, J. L. Kent, J. Zhao, M. C. Lacity, C. Maxwell and E. A. Pohl, "Improving Food Safety of Pork Supply Chain," Sponsored by Walmart Foundation, $3,200,000.00. (2020 – 2022).

Li, Y., **C. E. Rainwater**, J. L. Kent, M. C. Lacity and M. T. Kidd, "Poultry Excellence in China: Improving Food Safety in Poultry Supply Chain (Phase II)," Sponsored by Walmart Foundation, $3,500,000.00. (2019 – 2021).

Rainwater, C. E., W. Chaovalitwongse and J. D. Cothren, "Artificial Intelligence in Air Force Acquisition," Sponsored by KBR Wyle, Industry, $152,945.14. (2018 – 2022).

Rainwater, C. E., B. D. Williams, J. Chimka, A. Milburn, G. Parnell and E. Specking, "J.B. Hunt Innovation Center of Excellence," Sponsored by J.B. Hunt Transport Services, Inc., Industry, $2,500,000.00. (2017 – 2022).

Rossetti, M. D., B. W. Hill, E. A. Pohl, R. L. Turner, X. Wu, A. J. Alverson, W. Chaovalitwongse, C. T. Harris, C. R. Cassady, W. F. Limp, J. R. Tipton, R. R. Rao and W. -J. Lo, "Multidisciplinary Data Science (MDaS) to Better Prepare STEM Students with Emerging Data Science Skills," Sponsored by National Science Foundation, Federal, $1,000,000.00. (2019 – 2024).

Rossetti, M. D., "CELDi DLA Membership," Sponsored by Defense Logistics Agency, Federal, $80,000.00, 2021-2022.

Rossetti, M. D., "PFI AIR -TT: Fast Multi-Echelon Optimization via Grouping," Sponsored by National Science Foundation, Federal, $199,917.00. (2017 – 2021).

Schubert, K. D., C. S. Gattis, J. S. Popp, T. Carter III, C. Cao and G. Gunderman, "Innovation Training and Scholarships To Improve Student Retention and Graduation in STEM Fields," Sponsored by National Science Foundation, Federal, $999,864.00. (2021 – 2026).

Specking, E., "2021 Lockheed Martin Virtual Engineering Camps," Sponsored by Lockheed Martin Foundation, $7,500.00. (2021).

Sullivan, K. M., "CAREER: Survivable, Maintainable, and Adaptable Sensor Networks," Sponsored by National Science Foundation, Federal, $500,000.00. (2018 – 2023).

Wang, D., H. Seo and **S. Zhang**, "LP: Toward Fair and Reliable Consumer Acceptability Prediction from Food Appearance," Sponsored by NSF EPSCoR DART Project, State, $99,921.00. (June 2021).

Catanzaro, D. G., **S. Zhang** and S. Servoss, "COVID-19 Seroprevalence Survey of University of Arkansas Students, Staff and Faculty," Sponsored by NowDiagnostics, Industry, $137,552.00. (January 2021).

Zhang, S., E. Specking, H. Liao, C. E. Rainwater, X. Wu, R. A. McCann, S. V. Hernandez, W. Zhang and Q. Li,, "RET Site: Arkansas Data Analytics Teacher Alliance (AR-DATA)," Sponsored by National Science Foundation, Federal, $600,000.00. (2020 – 2023).

Wu, X., L. Zhang, **S. Zhang** and X. Liu, "Privacy Preserving and Fairness Aware Health Machine Data Analysis," Sponsored by West Virginia University, Institution of Higher Education, $200,000.00. (2019 – 2023). NSF Sub-award.

Catanzaro, D. G. and **S. Zhang**, "A Blood-based Multimetric Index to Predict Progression to Active Tuberculosis Disease," Sponsored by University of California, San Diego, Institution of Higher Education, $597,230.00 (2018 – 2023). NIH Sub-award.

Wang, D., H. Seo and **S. Zhang**, "LP: Toward fair and reliable consumer acceptability prediction from food appearance," Sponsored by NSF EPSCoR DART Project, State, $99,921.00. (2021 – 2023).

Catanzaro, D. G., **S. Zhang** and S. Servoss, "COVID-19 Seroprevalence Survey of University of Arkansas Students, Staff and Faculty," Sponsored by NowDiagnostics, Industry, $137,552.00. (2021 – 2021).

Zhang, S., A. Mian and L. Zhang, "Towards AI-Driven Smart and Connected Care for Pediatric Patients," Sponsored by Chancellor's Innovation Fund, University of Arkansas, $60,589.00. (2020 – 2022).

FEATURED PUBLICATIONS

In 2021 the faculty of the Department of Industrial Engineering at the University of Arkansas contributed one book, three book chapters, 44 refereed journal articles and 13 other refereed publications and proceedings. The faculty authors are indicated in bold.

Book

Rossetti, M. D. *Simulation Modeling and Arena*, 3rd and Open Text Edition 2021. https://rossetti.github.io/RossettiArenaBook/

Book Chapters

Liu, X. and M. Hajiha, "A Physics-Regularized Degradation Model for Cooling System Health Management." in H*andbook of Smart Energy Systems*, edited by Mahdi Fathi, Enrico Zio, Panos Pardalos, Springer 2021.

Specking, E., G. S. Parnell and E. A. Pohl, "Engineered Resilience Common Terminology." *Modelling the Resilience of Infrastructure Networks*, (pp. 2-26). European Safety, Reliability and Data Association (ESReDA) Editors: Rasa Remenyte-Prescott and Vytis Kopustinskas, 2021. ISBN 9782930928111

Jackson, S., V. Hailey, K. Willet, T. Ferris, **E. Specking**, "Patterns for Achieving Resilience in Engineered and Organizational Systems." *Multisystemic Resilience* (pp. 682-701). Oxford University Press 2021.

Journal Articles

Zhang, J., R. L. Rardin and **J. R. Chimka** (2021). "Budget Constrained Model Selection for Multiple Linear Regression." C*ommunications in Statistics Simulation and Computation*, (2021): published online: doi.org/10.1080/03610918.2021.1991956

Kiani, M., **B. Ekşioğlu**, T. Isik, A. Thomas and J. Gilpin. "Evaluating Appointment Postponement in Scheduling Patients at A Diagnostic Clinic." *Naval Research Logistics*, Vol. 69, Issue 1 (2022): 76-91

S. D. Ekşioğlu. "Contributions To Sustainable Bioenergy Systems Design, Planning and Operations." *IISE Transactions*, Vol. 53, Issue 8 (2021): 843-844

Bhosekar, A., T. Isik and **S. D. Ekşioğlu**. "Simulation Optimization of Material Handling in a Health Care Facility." *IISE Transactions in Health Care*, Vol. 11, Issue 4 (2021): 316-337

Ekşioğlu, S. D., B. N. Gulcan, M. N. Roni and S. J. Mason. "A Stochastic Biomass Blending Problem in Decentralized Supply Chains." *Naval Research Logistics*, Vol. 68, Issue 4 (2021): 434-453

Karimi, H., **S. D. Ekşioğlu** and M. Carbajales-Dale. "A Biobjective Chance Constrained Optimization Model to Evaluate the Economic and Environmental Impacts of Biopower Supply Chains." *Annals of Operations Research*, Vol. 296, Issue 1 (2021): 95-130

Ruiz, C., **H. Liao** and E. A. Pohl. "Analysis of Correlated Multivariate Degradation Data in Accelerated Reliability Growth." *Quality and Reliability Engineering International*, Vol. 37, Issue 7 (2021): 3125-3144

Hu, J., A. Xu, B. Li and **H. Liao**. "Condition-Based Maintenance Planning for Multistate Systems Under Time-Varying Environmental Conditions." *Computers and Industrial Engineering*, Vol. 158 (2021): #107380

Gu, W., N. Fan and **H. Liao**. "Fitting Aggregated Phase-Type Distributions to the Length-of-Stay in Intra-Hospital Patient Transfers." *Operations Research for Health Care*, Vol. 29 (2021): #100291

Karima, S., **H. Liao** and N. Fan. "Flexible Methods for Reliability Estimation Using Aggregate Failure-Time Data." *IISE Transactions*, Vol. 53, Issue 1 (2021): 101-115

Azucena, J., B. Alkhaleel, **H. Liao** and H. L. Nachtmann. "Hybrid Simulation to Support Interdependence Modeling of a Multimodal Transportation Network." *Simulation Modelling Practice and Theory*, Vol. 107 (2021): #102237

Obaidat, S. and **H. Liao**. "Integrated Decision-Making for Attributes Sampling and Proactive Maintenance in a Discrete Manufacturing System." *International Journal of Production Research*, Vol. 59, Issue 18 (2021): 5454-5476.

Gu, W., N. Fan and **H. Liao**. "Modeling the Length-of-Stay of Patients with Geriatric Disease or Alcohol Use Disorder using Phase-Type Distributions with Covariates." *IISE Transactions on Healthcare Systems Engineering*, Vol. 11, Issue 3 (2021): 181-191.

Zhang, X., **H. Liao**, J. Zeng, G. Shi and B. Zhao. "Optimal Condition-Based Opportunistic Maintenance and Spare Parts Provisioning for A Two-Unit System Using a State Space Partitioning Approach." *Reliability Engineering System Safety*, Vol. 209 (2021) #107451

Cheng, Y., **H. Liao** and Z. Huang. "Optimal Degradation-Based Hybrid Double-Stage Acceptance Sampling Plan for A Heterogeneous Product." *Reliability Engineering System Safety*, Vol. 210 (2021): #107544

Ma, Z., **H. Liao**, H. Ji, S. Wang, F. Yin and S. Nie. "Optimal Design of Hybrid Accelerated Test Based on The Inverse Gaussian Process Model." *Reliability Engineering System Safety*, Vol. 210 (2021) #107509

Zhang, F., J. Shen, **H. Liao** and Y. Ma. "Optimal Preventive Maintenance Policy for A System Subject to Two-Phase Imperfect Inspections." *Reliability Engineering System Safety*, Vol. 205 (2021): #107254

Obaidat, S. and **H. Liao**. "Optimal Sampling Plan for an Unreliable Multistage Production System Subject to Competing and Propagating Random Shifts." *IISE Transactions*, Vol. 53, Issue 11 (2021): 1244-1265

Zhao, B., D. Yue, **H. Liao**, Y. Liu and X. Zhang. "Performance Analysis and Optimization of a Cold Standby System Subject to delta-shocks and Imperfect Repairs." *Reliability Engineering System Safety*, Vol. 208 (2021): #107330

Liu, J., **H. Liao** and J.A. White. "Queueing Analysis of The Replenishment of Multiple In-The-Aisle Pick Positions." *IISE Transactions*, Vol. 53, Issue 1 (2021): 1-20

Sun, F., H. Li, Y. Cheng and **H. Liao**. "Reliability Analysis for a System Experiencing Dependent Degradation Processes and Random Shocks Based on a Nonlinear Wiener Process Model." R*eliability Engineering System Safety*, Vol. 215 (2021): #107906

Wang, H., **H. Liao**, X. Ma and R. Bao. "Remaining Useful Life Prediction and Optimal Maintenance Time Determination for a Single Unit Using Isotonic Regression and Gamma Process Model." *Reliability Engineering System Safety*, Vol. 210 (2021): #107504

Wang, H., **H. Liao** and X. Ma. "Remaining Useful Life Prediction Considering Joint Dependency of Degradation Rate and Variation on Time-varying Operating Conditions." *IEEE Transactions on Reliability*, Vol. 70, Issue 2 (2021): 761-774

Luo, H., B. Alkhaleel, **H. Liao** and R. Pascual. "Resilience Improvement of a Critical Infrastructure via Optimal Replacement and Reordering of Critical Components." *Sustainable and Resilient Infrastructure*, Vol. 6, Issue 1-2 (2021): 73-93

Liu, J., **H. Liao** and J. A. White. "Stochastic Analysis of an Automated Storage and Retrieval System with Multiple In-the-Aisle Pick Positions." *Naval Research Logistics*, Vol. 68, Issue 4 (2021): 454-470

Liu, X., K. M. Yeo and S. Y. Lu. "Statistical Modeling for Spatio-Temporal Data from Stochastic Convection-Diffusion Processes." *Journal of the American Statistical Association (Theory and Methods)*, (2021): published online: doi.org/10.1080/01621459.2020.1863223

Liu, X. and R. Pan. "Boost-R: Gradient Boosting for Recurrent Event Data." *Journal of Quality Technology, Special Issue-Artificial Intelligence & Statistics for Quality Technology*, Vol. 53, Issue 5 (2021): 545-565

Iranzad, R., **X. Liu**, W. A. Chaovalitwongse, D. S. Hippe, S. Wang, J. Han, P. Thammasorn, C. Y. Duan, J. Zeng and S. R. Bowen. "Boost-S: Gradient Boosted Trees for Spatial Data and Its Application to FDG-PET Imaging Data." *IISE Transactions on Healthcare Systems Engineering* (2021): published online: DOI: 10.1080/24725579.2021.1995536

Liu, X. "Statistical Machine Learning --A Unified Framework." *Journal of Quality Technology, Book Review*, (2021): published online: DOI: 10.1080/00224065.2021.2006582

Hajiha, M., **X. Liu** and Y. Hong. "Degradation under Dynamic Operating Conditions: Modeling, Competing Processes and Applications." *Journal of Quality Technology*, Vol. 53, Issue 4 (2021): 347-368

Liu, X. "A Simple Procedure for Analyzing Reliability Data from Double-Stage Accelerated Life Tests." *Quality Technology & Quantitative Management*, Vol. 18, Issue 1 (2021): 67-82

Mullin, E. and **A. R. Milburn**. "Logistics to the Rescue: An Elementary Introduction to Planning in Disaster-Response Decision Environments." *INFORMS Transactions on Education*, Vol. 21, Issue 3 (2021): 152-159

Bu, Fan and **Heather Nachtmann**, "Literature Review and Comparative Analysis of Inland Waterways Transport: 'Container on Barge'." *Maritime Economics & Logistics* (Aug. 2021): published online: https://link.springer.com/article/10.1057/s41278-021-00195-6

Delgado-Hidalgo, Liliana and **Heather Nachtmann**, "A Heuristic Approach to Managing Inland Waterway Disruption." *Engineering Management Journal*, Vol. 33, No. 1 (2021): pp. 2-14

Shallcross, N. J., **G. S. Parnell**, E. A. Pohl and S. R. Goerger. "A Value of Information Methodology for Multiobjective Decisions in Quantitative Set-Based Design." *Systems Engineering*, Vol. 24, Issue 6 (2021): 409-424

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Parnell, G. S., C. R. Kenley, C. A. Whitcomb and K. Palanikumar. "System Design and Engineering Trade-Off Analytics: State of The Published Practice." *Systems Engineering*, Vol. 24, Issue 3 (2021): 125-143

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UNDERGRADUATE PROGRAM OVERVIEW

The objectives of the undergraduate program in the Department of Industrial Engineering at the University of Arkansas are to produce graduates who, within just a few years of graduation, can:

- Successfully apply core industrial engineering knowledge and skills for industrial or public sector organizations,
- Successfully pursue advanced professional degrees, graduate studies in industrial engineering, professional training, or engineering certification and
- Demonstrate professional and intellectual growth as managers and leaders in industrial engineering, society and their communities.

Our curriculum includes not only industrial engineering courses, but also courses in mathematics, science, English, economics, accounting, social sciences, humanities and fine arts. University Professor, Richard Cassady, serves as the Chair of the Industrial Engineering Undergraduate Studies Committee.

Students enter our program in their second year, as all first-year College of Engineering students participate in the First-Year Engineering Program. Directed by Richard Cassady, the First-Year Engineering Program includes two semesters of academic coursework, peer mentoring, professional development, academic advising and academic coaching.

Since the First-Year Engineering Program was implemented in 2007, second-year retention (within the College of Engineering) of First-Year Engineering students has increased from approximately 60% to approximately 70%. Roughly 8% of retained First-Year Engineering students choose industrial engineering for their College of Engineering major.

More information on the undergraduate program can be found here:

UNDERGRADUATE STUDENT ACHIEVEMENTS

National Honor Society Scholarships

In April of 2022, we were notified that three of our senior students were recipients of a scholarship from Alpha Pi Mu, the industrial engineering honor society.

Natalia Sandhu received the 2021-22 Paul E. Givens Diversity Scholarship. Ann Elizabeth Givens established this scholarship in 2013 in memory of her late husband, Paul Givens. Givens contributed much to the profession of industrial engineering over his lengthy career and was a pioneer in new models for graduate education. Givens served Alpha Pi Mu with distinction as president, vice-president and longtime member of the executive council.

Sandhu served as the 2021-22 president of the U of A chapter of Alpha Pi Mu. She is also the director of membership for Women Impacting Supply Chain Excellence and is a member of the Honors College, Society of Women Engineers: Diversity and Inclusion Committee, Institute for Industrial and Systems Engineering, Order of Omega Honor Society and Delta Gamma sorority. During the school year, she also works as a peer mentor for the First-Year Engineering Program and for community outreach, she is also a member of our campus' Habitat for Humanity ReStore volunteer program.

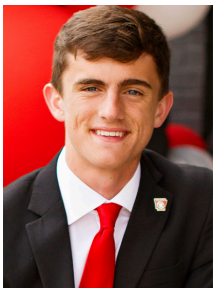
Shantal Sarmiento also received a scholarship from Alpha Pi Mu: the 2021-22 John L. Imhoff Globalization Scholarship. Lois Imhoff established this scholarship in memory of her husband, John L. Imhoff. Imhoff is recognized as one of the pioneers of modern industrial engineering education and the first department head of the Department of Industrial Engineering at the U of A. Imhoff was a believer in the contributions industrial engineering could make around the globe and was also a strong supporter of Alpha Pi Mu.

Decision Day 2022

Decision Day is held each spring, all students from the First-Year Engineering Program declare the discipline of engineering they will pursue.

Decision Day was back to the in-person format for 2022! The population of the industrial engineering department increased by 52 new students.

A native of Chiriqui, Panama, Sarmiento has served as an officer for the Society of Women Engineers for three years and just completed her second year as vice-president. Her service extends to other student organizations including Institute for Industrial and Systems Engineering, Society of Hispanic Professional Engineers, the Honors College, New Student & Family Program and the International Culture Team. Sarmiento has been a resident assistant for University Housing for two years, helping freshman students as they transition to college life. She also worked as an intern in the Market & Portfolio Optimization Department of Arkansas Electric Cooperative Corporation in Little Rock.



Coleman Warren received the 2021-22 Alpha Pi Mu Scholarship. Warren is the 100th Associated Student Government president at the U of A. He is an honors student pursuing two degrees — one in industrial engineering and one in political science. Throughout his academic career at the U of A, he has also been engaged actively in campus and in community service. You can read more about his outstanding service to the U of A and our community later in this publication.

Student Awards Banquet

In May 2022, the department recognized outstanding students at the annual Industrial Engineering Student Awards Banquet. In addition to the awards given at this event, the department awarded scholarships supported by the Arkansas Academy of Industrial Engineering. This year we were able to provide more than $223,000 in scholarships to 60 deserving students.

The undergraduate students recognized at the banquet with awards included Coleman Warren. He was recognized this year as the 2022 Industrial Engineering Outstanding Senior. Warren has represented the core values of this award to the highest standard throughout his time on campus. This is evidenced by his selection as our ArcBest Outstanding Freshman in 2019, a great start to his academic career. As mentioned before, look for more on this outstanding young man elsewhere in this publication.

The Outstanding Freshman award is sponsored by our industry partner ArcBest Corporation each year. The award is presented to one first-year engineering student who has declared industrial engineering as a major and is selected by the faculty and staff of the First-Year Engineering Program. The 2022 ArcBest Outstanding Freshman Award recipient was Daniel Terry.

Finally, corporate sponsor Hytrol Conveyors presents an annual Hytrol Challenge Award. The award is given to the best team in a competition in the transportation logistics or facility logistics course. The team of Emma Regier and Austin Wood were the recipients of the 2021 award. Regier and Wood earned the highest average score across three projects in INEG 4633: Transportation Logistics in Fall 2021. The three projects related to optimizing less-than-truckload pricing contracts, locating facilities in a supply chain network and designing vehicle routes to satisfy over 250 delivery requests.

Award Winning Students from IISE Conference

In 2022 we had a team of students selected as finalists to compete for the IISE Capstone Senior Design Award. The award recognizes outstanding application of industrial and systems engineering knowledge during a capstone senior design course resulting in a significant impact on an organization.

The team of: Spencer Loper, Henry Ward, John Santine, Luke Refie and Cody Parris were selected for their project, "Data Synthesis and Visualization for Near Real-Time Analysis of Final Mile Delivery Routes," for consulting firm Latrobe LLC. This team also received the Impact Award at the 2022 Capstone Symposium.

Junior Abby Harris received the UPS Scholarship for Female Students. Harris was nominated by the Department of Industrial Engineering

faculty. Trustees review the nominee's scholastic ability, character, leadership and potential service to the industrial engineering profession. Harris was chosen as one of only two recipients for this award for the 2022-23 academic year. In addition to her scholarship, Harris was one of three undergraduate students to take part in the Undergraduate Symposium. The others included Marshal Ray and Wesley Tate.

Capstone Symposium 2022

During the 2021-22 academic year, 59 industrial engineering seniors participated in the Industrial Engineering Capstone Experience as part of 12 teams. Every student pursuing the bachelor of science in industrial engineering at the U of A is required to complete the two-semester course sequence. Richard Cassady, university professor of industrial engineering, coordinates the courses.

This year, eight of the 12 projects were process improvement projects. During the fall semester, these teams developed an understanding of the details of the process of interest and the concerns that their industry partner had about the process. They then identified the key measures of process performance and assessed and evaluated process performance under current operating policies. In the spring semester, they made recommendations for improving process performance and evaluated the potential impact of these recommendations. They also provided deliverables that facilitate the implementation of recommendations.

The four remaining projects were system design projects. During the fall semester, these teams developed an understanding of the issues creating the need for the system, identified the system stakeholders, detailed the system requirements, assessed the perceived user value of each requirement and defined the minimum viable product. In the spring semester, they designed the system and evaluated the potential impact of implementing the system. They also provided deliverables that facilitated implementation of the system.

Each year, the experience concludes with the Industrial Engineering Capstone Symposium. In 2020, the symposium was cancelled due to the pandemic. In 2021, the symposium poster session and presentations were conducted remotely, but the awards ceremony was held in person. This year marked a return to the normal program with the entire symposium being held in the Arkansas Union Verizon Ballroom on May 4.

The awards presented included:

Team Awards

- Project of the Year: Luke Welch, project manager; Aidan Massanelli; Andres Luna Orosco Amelunge; Hector Aguilar; and Harrison West.
  Project Title: Balancing Workload by Optimizing the Assignment of Field Sales Proposals to Pricing Engineers
  Supported by: ArcBest

- Outstanding Achievement in Data Analysis: Olivia Gammill, project manager; Taylor Knabe; Jennifer Sanchez; Andrew Hume; and Patrick Gonzalez.
  Project Title: Reducing Patient Transportation Times Through Improved Staff Scheduling Using Simulation
  Supported by: Baptist Memorial Hospital-Memphis

- Outstanding Achievement in Modeling: Brandon Jerome, project manager; Jaiden Ellerbee; Ryan Kraichely; Terrance Martin; and Camille Sockwell.
  Project Title: Balancing Hospitalist Workload by Optimizing Patient Assignment Using Linear Programming
  Supported by: Parkland Health

- Outstanding Achievement in Decision Support: Emma Regier, project manager; Lucas Hicks; Emily Eskens; Jacob Reich; and Austin Wood.
  Project Title: Improving the Sustainability and Reducing Costs of Inbound Loads Using Lane Consolidation
  Supported by: Sam's Club

- Impact Award: Spencer Loper, project manager; Henry Ward; John Santine; Luke Rafie; and Cody Parrish.
  Project Title: Data Synthesis, Storage and Visualization for Near Real-Time Analysis of Final Mile Delivery Routes Databases with a Flexible Open Platform
  Supported by: LATROBE LLC

Individual Awards

- Outstanding Project Managers: Spencer Loper, Emma Regier and Luke Weiner.

- Outstanding Team Members: Andres Luna Orosco Amelunge, Camila Schrader and Austin Wood.

- Outstanding Faculty Advisers: Professor Chase Rainwater, Professor Manuel Rossetti and Professor Kelly Sullivan

- Outstanding Industry Partners: Michelle Mattiga, Crystal Bridges; Katie Parker, Baptist Memorial Healthcare; and Olga Tcheremenskaia, The Instituto Superiore Di Sanitá — Department of Environment and Health.

Other Projects

Additional projects the Capstone Experience Teams completed were:

- Project Title: Improving the Scheduling of Protection Services Staff by Creating a Microsoft Excel Application and Exploring Shiftboard's Full Functionality
  Team: Natalia Sandhu, project manager; Camila Schrader; Itza Della-Serra; Sarah Bollinger; and Esteban Siles.
  Supported by: Crystal Bridges Museum of American Art
- Project Title: Decision Making for Downstream Pace in the Event of Upstream Delays
  Team: Neil Balasekaran, project manager; Peyton Dunman; Noah Layton; Bailee Miller; and Maddie Pearl.
  Supported by: Gerdau
- Project Title: Developing a Consolidated Toxicological Database to Perform Chemical Risk Analysis and Predictions
  Team: Quinn Salverson, project manager; Andrew Banks; Colin Connelly; Kaitlyn Frey; and Rajaram.
  Supported by: The Instituto Superiore Di Sanitá — Department of Environment and Health
- Project Title: Maximizing Utilization of Intermodal Local Tractors Through Driver Reassignment
  Team: Coleman Warren, project manager; Faris Balbaid; Eric Gerstein; William Fletcher Rosenbleeth; and Hayden VanLaningham.
  Supported by: J.B. Hunt Transport Services Inc.
- Project Title: Improving the Usability and Accuracy of a Category Sales Forecasting Tool
  Team: Chloe Kordsmeier, project manager; Grant Glover; Collin Snieski; Caleb Gonzales; and Carolina Virreira.
  Supported by: Nestlé
- Project Title: Reducing Bone, Liver and Lung Biopsy Turnaround Times for Potential Oncology Patients by Standardizing System Processes
  Team: Shantal Sarmiento, project manager; Tayden Barretto; Stephen Branscum; and Paola H. Franco.
  Supported by: Parkland Health
- Project Title: Improving the Centralized Lending Processes for Increased Throughput Using Targeted Human-Centered Solutions
  Team: Luke Weiner, project manager; Cleondra Cooks; Anna Lee; Jaira Porter; and Aidan Grygar.
  Supported by: Republic Finance LLC

Honors Experience

The honors experience in our department is designed for students who are also enrolled in the University of Arkansas Honors College. The experience includes a minimum of 12 credit hours of honors courses, as well as an undergraduate research project that culminates with a thesis. In 2021-22, four undergraduate students completed the Honors College experience in our department:

Student	Thesis Title	Adviser
Brandon Jerome	Analyzing Vulnerabilities in the Northwest Arkansas Highway Network Using Mathematical Optimization	Kelly Sullivan
Coleman Warren	A Spatiotemporal Analysis of Food Pantry Accessibility in Washington County, Arkansas	Ashlea Milburn
Luke Weiner	Comparing Actively Managed Mutual Fund Categories to Index Funds using Linear Regression and Portfolio Optimization	Greg Parnell
Luke Welch	Implementing the CMS+ Sports Ranking Algorithm in a JavaFx Environment	Richard Cassady

COLEMAN WARREN - RHODES SCHOLAR

A native of Farmington, Arkansas, Coleman Warren is a dual major in industrial engineering and political science. His honors undergraduate thesis reflects both passions: "A Quantitative Analysis of Food Pantry Spatial Accessibility in Washington County, Arkansas."

He has excelled in and out of the classroom and in 2021 and 2022, his stellar achievements were recognized when he was named a Truman Scholar and Rhodes Scholar, respectively – the latter being an opportunity extended to only 32 students in the country. The only undergraduate student in the history of the University of Arkansas to receive both prestigious awards!

Warren is the founder and CEO of Simple + Sweet Creamery, a locally sourced, homemade ice cream company that donates a portion of its revenue to the Northwest Arkansas Food Bank to fight food insecurity in our area. He is also the founder and director of Simply Feeding, a 501(c)(3) organization.

In March of 2022 Simple + Sweet Creamery won first place and $10,000 in an international student startup competition hosted by the University of Manitoba and was featured in Arkansas Short Takes. (A special series of short videos featuring stories about outstanding students, faculty and special points of pride at the University of Arkansas.) Warren said his company competed not only against small business enterprises, but large-scale technology ventures. "I loved the opportunity to represent Arkansas and the U.S. at the global scale with our very locally focused business," he continued "Within the next two years, we hope to expand to a brick-and-mortar storefront with growth into our wholesale distribution to restaurants and grocers."

His cocurricular engagement and leadership experience at the University is broad. Warren is the 100th student body president. He previously served as director of policy and director of open education resources for the Associated Student Government. He has served as a College of Engineering peer mentor, a campus ambassador and partner with the Northwest Arkansas Food Bank, a junior counselor for Arkansas Boys State and in many other leadership roles.

Warren plans to use his Truman scholarship to pursue a master's degree in public policy. "Coleman will thrive in graduate school," said Todd Shields, dean of Fulbright College of Arts and Sciences. "The fact

that he is pursuing two honors degrees, one in engineering and the other in arts and sciences, points to his ability to make the most of a competitive academic environment. He will benefit greatly from the Truman Scholar community, networking with talented people across the country to glean from them how he can best serve our state and the issues that he wants to address. Coleman has been a great representative of our university and I have no doubt that the Truman Scholarship program will be just as proud of his accomplishments in the years to come as we are."

On campus, through his work with the Volunteer Action Center, Warren has found creative ways to use his engineering training to increase the organization's volunteer productivity. Warren helped create a way to automate the process of analyzing student volunteer data, which allows the Center to see which groups are volunteering more or less than the campus average. With this data, they can reach out to groups with high levels of engagement to see if there are any strategies that the Center can promote or use to increase service overall.

"Coleman has dreams and goals to serve our community and state on a bigger stage; he aspires to run for office one day," said Angela Oxford, director of the Volunteer Action Center. "I believe he has the makings of an excellent public servant and I can see him one day tackling big

Simple + Sweet Creamery

Simple + Sweet won first place and $10,000 in an international student startup competition hosted by the University of Manitoba and was featured in Arkansas Short Takes. (A special series of short videos featuring stories about outstanding students, faculty and special points of pride at the University of Arkansas.)

issues and working alongside people to create solutions to those issues. If our newest Truman Scholar's current endeavors like Simple + Sweet Creamery are any indication of his future potential to solve bigger problems and develop workable solutions through public service, I believe we are in good hands."

As a Rhodes Scholar, Coleman will pursue graduate study at Oxford University in the United Kingdom. In a press release, Elliot F. Gerson, American Secretary of the Rhodes Trust, called the Rhodes Scholarships, "the oldest and best-known award for international study and arguably the most famous academic award available to American college graduates." He went on to say that "a Rhodes Scholar should show great promise of leadership. In short, we seek outstanding young people of intellect, character, leadership and commitment to service." Gerson said that the Rhodes Trust seeks students who believe in "the performance of public duties as their highest aim." More than 2,300 outstanding students applied for the Rhodes Scholarship 2022 competition and only 32 U.S. Rhodes Scholars were chosen.

"Coleman Warren is a remarkable person who is very deserving of the level of recognition the Rhodes Scholarship represents," said Charles Robinson, interim chancellor for the University of Arkansas. "Coleman has made a significant difference throughout his academic career but especially as Arkansas Student Government president. He has worked on a variety of important issues here and in the community, all while being a stellar student. I am very proud of him and his many accomplishments, that go well beyond the winning of this high honor. I am also very proud that he will represent our student body where so many shine in their fields of study and who like Coleman, have service deeply imprinted on their hearts. He is a leader on this campus — this award and the study at Oxford will build on the foundation that he has laid here. I look forward to watching as the impact he will have on our state and our country unfolds in the years to come."

Coleman was also featured during a live broadcast of Good Morning America. T.J. Holmes surprised Warren with a donation of 20,000 pounds of food to the Northwest Arkansas Food Bank as well as a $5,000 donation to Simple + Sweet Creamery to help continue his fight against child hunger.

He is the recipient of the Chancellor's Scholarship and the Governor's Distinguished Scholarship, ArcBest Outstanding Freshman in 2019, the Industrial Engineering Sophomore Scholar Award, an Arkansas Academy of Industrial Engineers Scholarship and the Gold President's Volunteer Service Award. As well the 2022 College of Engineering Outstanding Senior and the Industrial Engineering 2022 Outstanding Senior, he also received the honor of First Ranked Senior Scholar. Coleman was also recognized with the 2022 Senior Honor Citation. The citation was established in 1965 by the Arkansas Alumni Association .

"When I first came to the University of Arkansas, I had no idea what being a Razorback truly meant," Warren said. "We have a family here. I am grateful to have been loved, supported and cheered on in every step of my college career and I would not be who I am without this community."

GRADUATE PROGRAM OVERVIEW

Graduate course offerings of the Department, as well as research opportunities for Industrial Engineering graduate students, continue to grow and diversify. A sampling of our graduate students' published work, highlighted in this section, illustrates the range of research interests being pursued under the guidance of our faculty. Also featured in this section are our professional graduate programs in Master of Science in Operations Management, Master of Science in Engineering Management and our newest program Master of Science in Operations Analytics.

For students pursuing graduate studies in the field of industrial engineering, we offer several options with respect to degree, area of specialization and full-time or part-time studies.

Graduate degrees for on-campus students are offered in two areas:

Master of Science in Industrial Engineering (M.S.I.E.)

We have a strong and diverse master's program that provides opportunities for study in specific areas in industrial and systems engineering, as well as general master's study. Thesis, non-thesis and project tracks are available for all students. Master's graduates can select a plan that leads to advanced study at the Ph.D. level, or one that prepares them to challenging positions in the public or private sectors.

Doctor of Philosophy in Engineering (Ph.D.)

The Department of Industrial Engineering at the University of Arkansas has a reputation as one of the top doctoral programs. This reputation stems from the cutting-edge research conducted here and by the collaboration of a strong and experienced faculty with the top graduate students in the field. Doctoral students in industrial engineering experience rigorous academic study, requiring independent investigation that results in original scholarly work of the highest quality. Graduates are well prepared for positions in both academia and the private or public sector.

In addition to traditional degree options, the Department also offers online, the Master of Science in Operations Management (M.S.O.M.), the Master of Science in Engineering Management (M.S.E.M.) and the new Master of Science in Operations Analytics (M.S.O.A.).

Our faculty's wide range of expertise provides opportunities for study in a variety of areas such as:

- Transportation, Logistics & Distribution
- Healthcare Systems Engineering
- Reliability, Maintainability & Quality Engineering
- Engineering Management
- Big Data and Data Analytics

These areas continue to be supported by the following research centers and laboratories:

- Center for Excellence in Logistics and Distribution (CELDi)
- Mack Blackwell Rural Transportation Center (MBTC)
- Maritime Transportation Research and Education Center (MarTREC)
- ReliaSoft Risk, Reliability and Maintainability Research Alliance
- Arkansas Security Research and Education Institute (ASCENT)
- System Design and Analytics Laboratory
- J.B. Hunt Innovation Center of Excellence

Burak Ekşioğlu serves as Graduate Coordinator and oversees the Master of Science in Industrial Engineering and the Ph.D. programs.

Greg Parnell serves as Director for the Master of Science in Operations Management and the Master of Science in Engineering Management programs and Chase Rainwater, associate department head and professor serves as director of the Master of Science in Operations Analytics.

More information can be found about our graduate programs here:

INFORMS STUDENT CHAPTER AWARD

The U of A student chapter of INFORMS was also given the Cum Laude Award for exceptional communications, special events and initiatives, community service and chapter operations.

Despite pandemic limitations and challenges, the chapter was very active.

Reza Iranzad accepted the Cum Laude Award for the U of A INFORMS Student Chapter.

GRADUATE STUDENT ACHIEVEMENTS

Graduate Recognitions from INFORMS

Doctoral student, Guanzhou Wei, received the Best Paper Award in the application track at the 16th INFORMS Workshop on Data Mining and Decision Analytics, at the 2021 Institute for Operations Research and the Management Sciences annual meeting held virtually and in-person in Anaheim, California. A total of 48 papers were submitted, four finalists were named and Wei's paper was selected based on the quality of the paper and the presentation.

Xinchao Liu and Guanzhou Wei

Also recognized was Xinchao Liu, a doctoral student who received the Best Poster Award at the student poster competition organized by the Quality, Statistics and Reliability section. Liu is advised by assistant professor Xiao Liu. Wei also received an honorable mention in the student poster competition. Wei is co-advised by assistant professor, Xiao Liu and professor, Haitao Liao. The poster competition received 12 submissions from nine universities. One winner and one honorable mention were selected.

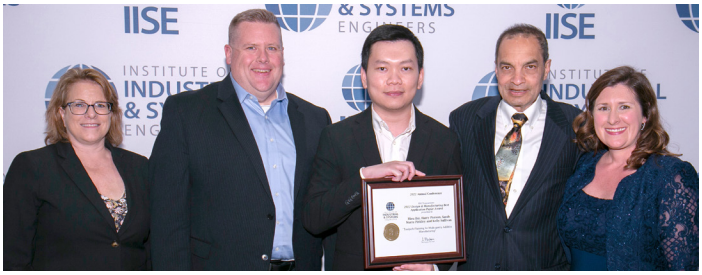
Doctoral student Maryam Alimohammadi received the Women in OR/MS (WORMS) Colloquium Travel Award. The award included registration to the 2021 virtual INFORMS annual meeting, registration to the doctoral student colloquium and a year membership to WORMS. Alimohammadi was nominated for the award by her adviser, associate professor Shengfan Zhang.

The U of A student chapter of INFORMS was also given the Cum Laude Award for exceptional communications, special events and initiatives, community service and chapter operations. Despite pandemic limitations and challenges, the chapter was very active. It organized multiple virtual events, training opportunities and seminars with invited speakers from different universities and companies.

Activities of the 2020-21 chapter were led by the following elected officers: Amin Asadi, president; Maryam Alimohammadi, vice president; Reza Iranzad, treasurer; and Daniel Lopes da Silva, secretary. The chapter was also supported by acting faculty adviser Heather Nachtmann and faculty adviser Shengfan Zhang.

The Institute of Industrial and Systems Engineers Conference

Hieu Trung Bui with co-authors Harry Pierson, Sarah Nurre Pinkley and Kelly Sullivan, received a Best Paper Award at the national conference of the Institute of Industrial and Systems Engineers in May 2022. The award recognizes outstanding research papers published in *IISE Transactions*, the flagship journal of the institute. The title of Bui's paper was "Toolpath planning for multi-gantry additive manufacturing." Bui is advised by Sandra Ekşioğlu.



Eileen Van Aken, Harry Pierson, Hieu Bui, Bopaya Bidanda and Amanda Mewborn.

A team of master's students: Rajon Paul Pantha, Dhiraj Pokhrel and Matthew Walters, also advised by Sandra Ekşioğlu, received the Logistics and Supply Chain Division Student Case Award for their study providing a solution to a problem focused on "Coastal Shipping for Automotive Distribution." This was an international competition open to any student team.

And we had four doctoral students who participated in the Doctoral Colloquium and the Doctoral 3-minute Pitch Competition: Neel Chanchad, Fan Bu, Maryam Alimohammadi and Maryam Kheirandish.

Departmental Graduate Student Awards

The Outstanding Graduate Student for 2022 from the Department of Industrial Engineering was awarded to Mohmmadmahdi Hajiha. With his adviser, Xiao Liu, Hajiha has been conducting research in Bayesian statistics with applications in a variety of areas, including predictive analysis, statistical and machine learning. He has published his research in the *Journal of Quality Technology*, has a paper under second-round review with the *Journal of Reliability Engineering and System Safety* and authored a book chapter in the *Handbook of Smart Energy Systems*. He completed an operations research internship with FedEx Freight, working on the network optimization team. In addition, Hajiha was active on campus serving as an officer in the Iranian Student Association.

The 2021 Graduate Research Award was presented to Maryam Kheirandish. Kheirandish has been conducting research in medical decision making. She developed a landmark modeling method and machine learning algorithms for tuberculosis treatment outcome prediction. In 2021, she published this work in the *Journal of the American Medical Informatics Association* and presented it at the INFORMS annual meeting. Her adviser, Shengfan Zhang, speaks very highly of her performance as data manager for several collaborative research projects, where she designs data collection forms and trains international team members on data related issues.

The Department of Industrial Engineering was well represented at the national conference of the Institute of Industrial and Systems Engineers, held May 21-24 in Seattle.

COLLEGE OF ENGINEERING
Industrial Engineering

Master of Science in Operations Anayltics

The Department of Industrial Engineering offers a graduate program leading to the Master of Science in Operations Analytics (M.S.O.A.) for engineering, science and other non-engineering graduates.

The Master of Science in Operations Analytics is an intensive program that will guide students through the theory and practice of the quantitative modeling of enterprise operations via descriptive, predictive and prescriptive analytics.

Students will develop knowledge of the principles and practices of analytics modeling methods, such as optimization, statistical modeling, machine learning, simulation and computing methods, as they apply to the strategic, operational and tactical control of operations.

Why the U of A in Fayetteville?

Excellent Ranking

The Industrial Engineering Graduate Program ranked in the top 30 Best Graduate Schools in U.S. News & World Report, at 29th overall and 22nd among public universities.

Program Features

- 8 week courses
- Can be completed 100% online
- Designed to be completed by either working professionals or full-time students

INDUSTRIAL-ENGINEERING.UARK.EDU

operations-analytics.uark.edu

MSOM/MSEM PROGRAMS OVERVIEW

The Master of Science in Operations Management (M.S.O.M.) graduate degree program began in 1974 and is designed for professionals from a broad range of backgrounds, including business and government operations. Students learn how to create value to the production of goods and services while working with worldwide suppliers and customers. The Master of Science in Engineering Management (M.S.E.M.) graduate degree program began in 2017 and prepares engineers to lead and manage teams, projects and organizations with technical workforces to meet strategic objectives.

The M.S.O.M. program continues to thrive. This applied management program for working professionals attracts managers and professionals in various business sectors, industries, military branches of service and government bodies.

In the 2021-22 academic year, there were 667 unique students enrolled in the program and a total of 2,404 course enrollments for the year. Over ninety percent of those enrollments were online courses. The Master of Science in Operations Management program continues to be the University's largest graduate program with 217 students completing their degree in the 2021-22 academic year.

The coursework emphasizes practical knowledge in areas such as project management, decision making, supply chain management, quality management and many other areas of importance to today's manager. Program content focuses squarely on the concepts, methods and tools that are essential to the successful management of work processes, projects and people in a wide spectrum of organizations. The curriculum has an industrial engineering perspective on the principals of management and equips graduates to carry out their managerial responsibilities more effectively. Students can select from thirty-sevem graduate courses to make up the ten required to complete the degree. Two new courses have been added: OMGT 5913 Advanced Air Mobility & Autonomous Operations (summer 2022) and OMGT 5693 Advanced Analytics and Visualizations for OM (fall 2022).

The program is offered at the University of Arkansas' flagship Fayetteville campus and via online learning. It is also hosted on two active-duty bases, Naval Support Activity Mid-South at Millington, Tennessee; and Hurlburt Field Air Force Base at Fort Walton Beach, Florida.

By operating in eight-week terms and having an online option for program courses, the flexibility of the program accommodates students employed full-time by Fortune 500 companies such as Walmart, Sam's Club, Tyson Foods, J.B. Hunt Transport, FedEx, Lockheed-Martin and Pratt & Whitney. We are proud of our military affiliation and have many current military members and veterans as students from all branches of service stationed at our host bases and throughout the world.

The curriculum is presented by outstanding faculty members who are drawn from the University's Industrial Engineering Department and from businesses throughout the country. There are three industrial engineering faculty members, with three full-time Master of Science in Operations Management instructors and fifty part-time instructors who teach in the program. The program employs business professionals as instructors, who are academically qualified and have accrued extensive managerial industry experience.

Admission to the program requires a student to have a minimum grade-point average of 3.0 either on the last sixty credit hours of attempted baccalaureate coursework, or from all coursework from the first conferred baccalaureate degree from a regionally accredited institution. The program now encourages students who have a GPA between 2.5 and 3.0 to enter one of the accompanying graduate certificates, in order to gain admission if they complete coursework with a 3.5 GPA. This is a popular option that is helping more students matriculate into the program.

Graduate Certificates

The motto, "Learn it Today, Use it Tomorrow" guides the program. With this goal in mind, the program has five, four-course graduate certificates that are popular among Master of Science in Operations Management students. The certificates can be taken concurrently with the Master of Science in Operations Management or Master of Science in Engineering Management programs or be earned as a stand-alone certificate. The certificates are in Project Management, Lean Six Sigma, Homeland Security, Operations Management and Engineering Management.

New in summer 2022, microcertificates became available. Each microcertificate consists of two courses for a total of six credit hours and are a pathway for students to build their credentials along the way to earning other microcertificates, graduate certificates or even their master's degree. The new microcertificates are in: Advanced Air Mobility, Analytics for Operations Managers, Decision Support

for Operations Managers, Leading Operational Change, Systems Engineering Analytics and Systems Engineering & Engineering Management. Students are able to complete their first credential in as little as eight weeks.

With the M.S. in Operations Management and the M.S. in Engineering Management, you can start with a two-course microcertificate, continue with additional microcertificates or four-course graduate certificates, then apply all courses to a ten-course graduate degree. Many of these programs could help prepare students to sit for a national exam for credentials and one leads to obtaining an FAA Remote Pilot certification.

As of spring 2022, 556 students have graduated with the Project Management Graduate Certificate, thirty-eight students for Homeland Security and seventy-two for Lean Six Sigma.

Master of Science in Engineering Management

The Master of Science in Engineering Management had it's highest enrollment over the academic year 2021-22 with 119 active students. The curriculum introduces students to historical and contemporary management theories and provides practical techniques to apply managerial best practices within technical environments. This program is designed for engineers with ABET-accredited bachelor's degrees in engineering who want to move into leadership positions in their organizations.

Introducing Our Newest Staff

In fall 2021 we added two new members to our Master of Science in Operations Management/ Engineering Management team: Megan Whobery and Joy Jenkins. Megan has been working in higher education and student services for 10 years. She joins M.S.O.M./ M.S.E.M. as an Academic Adviser and Academic Coordinator.

Megan Whobery

Joy Jenkins

Joy earned her undergraduate degree in industrial engineering in 2019 and her graduate certification in Technical Writing and Public Rhetoric in 2021, Joy is the Administrative Specialist III and a freelance technical editor.

Over summer 2022, Jacob Hiatt joined the team. Jacob has spent the last six years working as a Scholarship Coordinator for the Office of Sponsored Students and Special Programs at the U of A. He is stepping into the Fiscal Support Manager role.

Jacob Hiatt

Annual Faculty Meeting

The annual Faculty Meeting was held July 22, 2022 with over fifty in attendance. Those present included the Master of Science in Operations Management and Master of Science in Engineering Management faculty, staff and guest speakers. Those gathering in-person met a the Don Tyson Center for Agricultural Sciences, with twelve attending virtually, to collaborate on course development and to participate in training.

During the meeting, instructors learned best practices from one another, engaged in a panel discussion with students and received insightful information and updates regarding department plans and online services such as ProctorU and Blackboard.

In addition to the learning and networking opportunities, there were awards presented to the staff, faculty and community partners.

Jacob Mahaffey was the recipient of the Rookie of the Year award. The award recognizes an outstanding instructor who has gone above and beyond to contribute to student success and program efforts, making a difference in a relatively short period of time. Jacob rebuilt the last "live" course, making 100% of course offerings, now online. His positive attitude makes him a delight to work with, and his students all have great things to say about him.

The Innovator of the Year award went to Leonard Nethercutt. The Innovator of the Year is open to any instructor in MSOM or MSEM, who increases learning outside the traditional curriculum through innovative teaching and service. Leonard's solutions oriented, positive attitude and innovative teaching methods make him a treasured member of our team. And, his students can't say enough positive things about him.

Greg Hutto was the recipient of the Randy Roy Instructor of the Year award. The award recognizes an instructor who goes above and beyond to help students in the MSOM and MSEM programs and has volunteered to help when program needs arise. Greg has picked up new and additional courses to teach, including classes for the Department of Industrial Engineering.

The final award at this year's faculty meeting was the Campus Partner Award. The recipient this year has made significant contributions to support program effort in student, instructor, or program development. Shelly Walters was the natural choice. She works with University of Arkansas Information Technology Services and has supported the M.S.O.M. and M.S.E.M. programs through collaboration, involvement and partnership. From supporting course developments, ever-changing program plans, setting up and testing video synchronous classrooms - or anything else where help was needed, Shelly has always taken time out of her busy schedule to help and has been an essential part of our continued improvement for over 8 years.

M.S. Operations Management Student Receives the Benjamin Franklin Lever Tuition Fellowship

Layla David, a first-year graduate student in the Master of Science in Operations Management program, was awarded the Benjamin Franklin Lever Tuition Fellowship. This highly competitive award is presented to students who reflect the university's commitment to academics and diversity.

In 2021, David graduated from the Sam M. Walton College of Business with a B.S.B.A. in management with an organizational leadership concentration. David was looking for a graduate program to complement her business degree and found the M.S.O.M. program.

"By pursuing operations management and pairing it with what I have learned in business management," David said, "I'll be able to utilize those skills to manage daily and long-term operations by developing effective marketing campaigns and services within the sports industry."

David states that the pandemic drove her to research graduate programs because she was not confident that looking for employment during these difficult times would be easy. The M.S.O.M. program was appealing to her because it can be completed in two years or less.

Currently, David works within the Walton College as a digital marketing support specialist. During her undergraduate career, David worked for the Razorbacks Athletic Department. Her passion for graphic design allowed her to obtain several internship opportunities.

David adds this award will help ease the financial burden: "This fellowship will help me further my education by allowing me to focus solely on my studies."

Provided by the U of A Graduate School the Lever Fellowship pays for full graduate tuition of degree-related coursework for the duration of the degree program.

Antonella Godoy recipient of the M.S.O.M. Scholarship

Godoy received the scholarship based upon academic achievement. Godoy shared that starting off in an administrative position, she quickly moved up in the company where she was working and found that operations management was an area she really enjoyed. Family and friends recommended the U of A.

Godoy earned a Bachelor of Science in petroleum engineering from the University of Comahue in Patagonia, Argentina, in 2019. During her undergraduate studies, she received several scholarships and she is grateful that she was awarded this opportunity to complete her graduate studies, she said.

Godoy has a position waiting for her upon graduation in the Amazon Pathways program. This five-year program is an Operations Leadership Development Program for Worldwide Operations at Amazon. The goal of Pathways is to prepare and develop master's-level graduates in engineering, supply chain, logistics or similar disciplines into Amazon's next general managers and directors. She also states that being bilingual will give her an edge up in this new role since it deals with global operations.

"I decided to focus my elective classes in project management and lean six sigma, trying to balance my engineering background with more management skills that will be needed in this new role. Data analysis was also on the list since I will be handling large amounts of data," she said.

The scholarship winner for fall 2022 is Ashley Accord. Ashley has a Bachelor of Arts in Film from the University of New Orleans and is currently working as a Video Producer at PAM Transport in Springdale. She shared that she uses Project Management concepts in her everyday work.

The M.S.O.M. Scholarship was first awarded in 2018 and is awarded each fall and spring semester. It is funded by generous donations from alumni, staff and friends.

Amass Family M.S.O.M. Award

The program has a new scholarship, the Amass Family M.S.O.M. Award. A member of the M.S.O.M. Alumni Society Board of Directors, Ed Amass is a 2013 graduate. He and his wife donated the funds for the award. The inagural recipient is Islam Md Khursidul. Islam grew up in Bangladesh and has a bachelor's degree in Biomedical Engineering from University of Connecticut. He currently works for Medtronic as a Controls Engineer.

You can learn more about these graduate programs below:

Master of Science in Operations Management

Master of Science in Engineering Management

Alumna of MSOM Named First Woman Commander of the USS Constitution

University of Arkansas alumna Cmdr. Billie J. Farrell became the 77th commanding officer of the USS Constitution on Friday, Jan. 21 and the first woman to serve as captain in the ship's 224-year history.

"I am honored to have the privilege to command this iconic warship that dates back to the roots of both our nation and our Navy and to have been afforded the amazing opportunity to serve as USS Constitution's first female commanding officer in her 224 years," Farrell said.

"I hope to strengthen the legacy of USS Constitution through preservation, promotion and protection by telling her story and connecting it to the rich heritage of the United States Navy and the warships serving in the fleet today," she said.

Farrell is a native of Paducah, Kentucky and is a 2004 graduate of the U.S. Naval Academy, where she earned a Bachelor of Science and the Univesity of Arkansas, earning a Master of Science in Operations Management in 2009 while serving in the Navy.

The Master of Science in Operations Management program teaches skills for improving operational decisions including process design, scheduling, quality management and logistics. Along with the master's degree, the program offers graduate certificates several different subjects.

The program is ideal for members of the armed forces who need flexible schedules while serving and taking classes at the same time. The operations management program is offered online and in hybrid format during five eight-week sessions each year.

Farrell's first tour was aboard the USS Vella Gulf as electrical officer. She then briefly took over as an operations division officer before being promoted to navigator for her second tour.

After those two tours, she reported to Commander, Naval Personnel Command in Millington, Tennessee, where she was named an action officer in post selection board matters. While there, she assumed the duties as delay section head and assistant board screener.

After departing Tennessee, Farrell started through the department head pipeline. She was stationed aboard the USS San Jacinto in March 2012 as the weapons officer. She then assumed the responsibilities as the combat systems officer onboard.

Her next tour was as the deputy director for professional development at the U.S. Naval Academy. After departing the academy, Farrell reported to Commander, Naval Surface Force Atlantic as deputy N3. She also served as the executive officer aboard the Ticonderoga-class guided missile cruiser USS Vicksburg.

Farrell's awards include two Meritorious Service Medals, four Navy and Marine Corps Commendation Medals and three Meritorious Unit Commendation Medals.

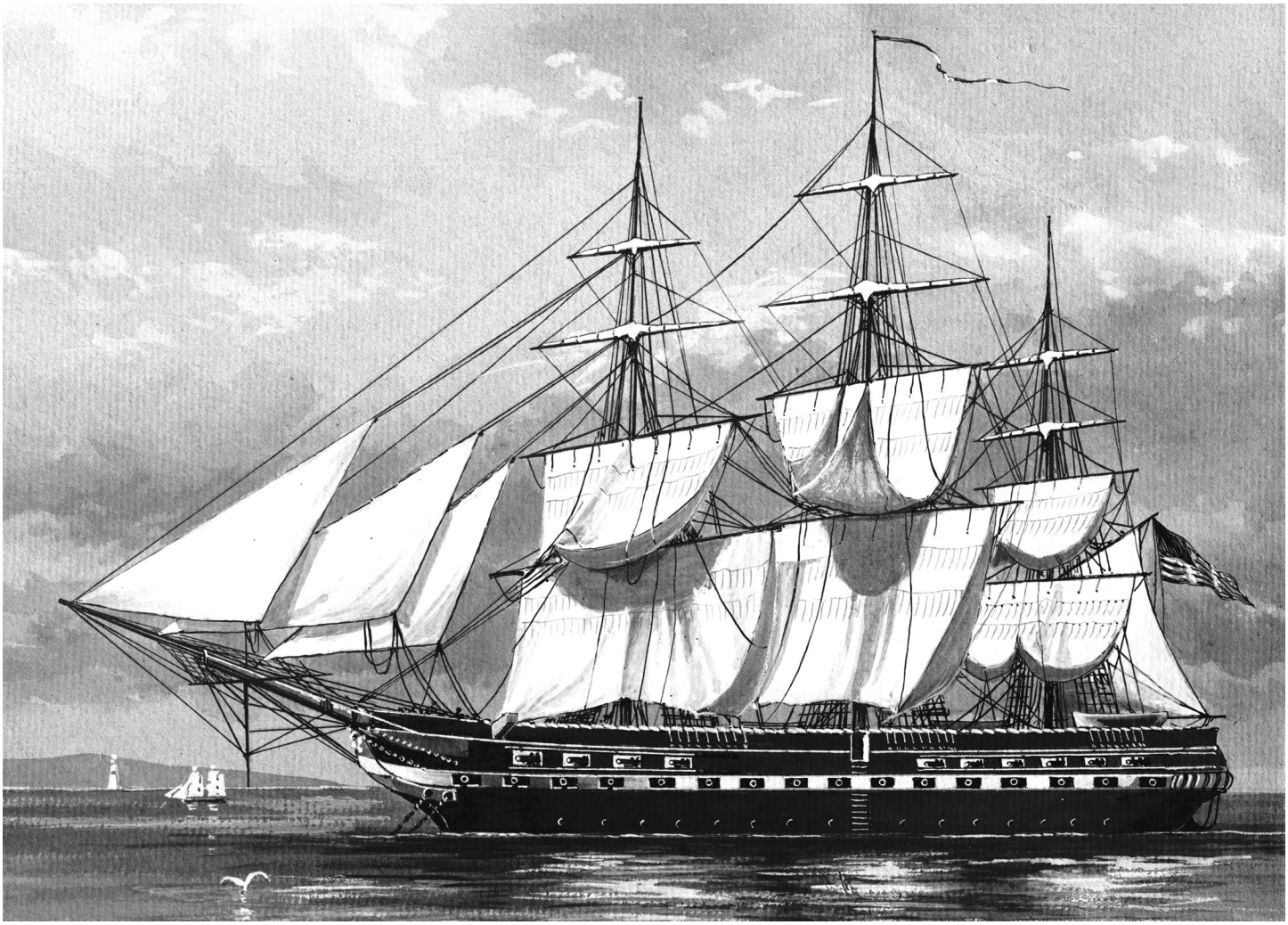
"I know the crew is in great hands with Commander Farrell," said the USS Constitution's current commanding officer, Cmdr. John Benda. "This historic barrier is long overdue to be broken. I cannot think of a better candidate to serve as USS Constitution's first female commanding officer. I look forward to watching what she and the crew accomplish in the next few years."

The USS Constitution is the world's oldest commissioned warship still afloat and played a crucial role in the Barbary Wars and the War of 1812, actively defending sea lanes from 1797 to 1855. The ship earned the nickname of "Old Ironsides" during the war of 1812, when British cannonballs were seen bouncing off the ship's wooden hull.

The USS Constitution was undefeated in battle and destroyed or captured 33 opponents.

Today, the USS Constitution partners with the USS Constitution Museum to promote maritime heritage, naval service and the legacy of Old Ironsides. The active-duty sailors stationed aboard the USS Constitution provide free tours and offer public visitation as they support the ship's mission of promoting the Navy's history and maritime heritage and raising awareness of the importance of a sustained naval presence.

"The USS Constitution Museum is honored to welcome Commander Billie J. Farrell, 77th Commanding Officer of USS Constitution," said Anne Grimes Rand, president and CEO of the USS Constitution Museum. "This is an exciting time in Boston with a female mayor and a female captain for Old Ironsides."



USS Constitution - between 1900 and 1920
Library of Congress Prints and Photographs Division Washington, D.C.

College of Engineering Partners With Area Leaders at 2022 UP.Summit Community Day

The M.S. in Operations Management program was invited to collaborate with the U of A's Division of Economic Development, Division for Research and Innovation and the College of Engineering for the 2022 UP.Summit Community Day held June 5, 2022 at Thaden Fieldhouse in Bentonville, Arkansas. This all-day event was geared toward the future of transportation and advanced air mobility while showcasing the latest technologies and flight demonstrations.

The UP.Summit was founded by UP.Partners, a multi-strategy mobility-focused investment firm that forges alliances with some of the world's most impactful transportation technology companies in an effort to help move people and goods cleaner, faster, safer and at lower cost — on the ground, in the air, on the sea and in space. The event featured demonstrations of electric and autonomous aircraft, electric and autonomous cars and trucks, remote-controlled construction equipment, hydrogen-powered yard trucks, drones and many other prototypes. This was an opportunity to introduce to the community one of the newest programs on campus, the M.S.O.M. Advanced Air Mobility Autonomous Operations Microcertificate.

Richard Ham, associate director of the Master of Science in Engineering Management and Master of Science in Operations Management, described the significance of the event to the university's mission.

"The university leadership and faculty have been active in research and education vital to achieving the type of innovation on display at this event. Our students have gone on to employment with some of the companies represented and have searched for answers to many of the challenges in ongoing research," Ham said. "Our new microcertificate in Advanced Air Mobility prepares students in both roles."

About the New Advanced Air Mobility Microcertificate (AAM)

The College of Engineering is offering a new graduate microcertificate in advanced air mobility autonomous operations to prepare leaders for the evolution of transportation and supply chain systems.

This exciting new offering prepares adult learners who have little or no background in aviation to obtain their Federal Aviation Administration Remote Pilot Certificate, obtain complex FAA waivers and program unmanned aircraft systems (drones) to perform complex tasks such as building 3D models, doing thermal inspections, performing aerial surveying, measuring volume or distance remotely and tracking construction projects over time. Additionally, students obtain new skills understanding trends and future uses in supply chain delivery by drone, future eVTOL (electric vertical take-off and landing aircraft), new supply chain models, solving airspace issues and emerging job skill demands.

Deloitte and the Aerospace Industries Association estimate that the economic impacts of advanced air mobility to be $115 billion by 2035 and over 280,000 new high-paying jobs. Both NASA and the FAA point to emerging needs for on-demand air mobility, cargo and package delivery, health care applications, emergency services and new connected multimodal transportation networks. Preparing a skilled workforce is vital to the success for advanced air mobility. There is no faster way to quickly upskill with a recognized credential than earning a graduate microcertificate. A graduate microcertificate in advanced air mobility autonomous operations is open to anyone with a bachelor's degree in any discipline. The U of A graduate microcertificate in advanced air mobility autonomous operations requires a minimum of two courses and can be completed in one semester or two eight-week sessions. Courses may be completed online, by synchronous video or live at the University of Arkansas Global Campus in Bentonville, Arkansas.

With 40 years of experience as a pilot, air traffic controller, TERPS specialist (engineering and design of complex approaches for aircraft in the weather), airspace manager, airport manager, unmanned aircraft systems research and aviation workforce development, Ham developed the advanced air mobility autonomous operations graduate microcertificate to bridge the gap between current aviation workforce skills and future needs of the AAM workforce.

"There is an immediate need for new skills in AAM as supporting infrastructure is developed," Ham said. "This is not a need 10 years from now; there exists a need for a workforce skilled in this area now, with rapid growth over the next decade. Whether wanting to design new systems or work as an operations manager, engineer or programmer, we need to ramp up quickly now."

Heather Nachtmann, associate dean in the College of Engineering and the U of A lead on smart mobility initiatives, said, "We are grateful to Dr. Ham for his leadership in AAM. He has been a driving force on our campus behind workforce development and public-private partnerships to accelerate smart mobility innovation. The AAM graduate microcertificate is one piece of the U of A's comprehensive vision to drive smart mobility education and innovation."

AN EPIC TIME IN LIFE

Engineering Alumni Keep in Touch Since the "Big Shootout"

Back: Dennis Abell, Gary Reed, Larry Robertson, Wayne Garrison, Ken Rogers and John Kelly.
Front: Kinch Meyer and Dean Kim Needy.

It's hard to know exactly what kept them in touch for all these years. They bonded over difficult coursework and a six-day school week at a time the College of Engineering's orientation told them pointedly that only one-third of them would graduate. In those days, there was a long wait to call home from an off campus pay phone, so talks with parents were infrequent.

There were late nights at the apartment where they studied and partied, and the epic 1969 football game known as the Arkansas-Texas "Big Shootout" where they lucked into 50-yard-line seats. They still crack up over the time Ralph Evans B.S.Ch.E '71 drove his Pontiac GTO across Old Main lawn. On the downside, each man's military draft number (the higher, the better) factored into future plans.

After graduation, they shared each other's ups and downs in marriage, children and work. They kept it together through the lowest lows, including when Evans drowned in a scuba diving accident during one of their Arkansas reunions.

The group of 1971 College of Engineering alumni, now all retired, descended on campus with their wives in October to reminisce, see how the area has prospered and pay tribute to the late Evans by adding to the scholarship his widow established in his name. They were among the first to contribute and have continued to donate over the years.

One of the men's daughters pointed out that it's unusual for a group of guys to keep in touch in the way they have. "I feel like these are my brothers," said Gary Reed B.S.M.E. 71, "When you look at a photo of us together, we even look like family."

Each man treasures his time at the College of Engineering and the U of A for setting them on the right course. "My education at the university made a tremendous difference in my life, in all of our lives," said Dennis Abell B.S.I.E. '71 "It's a special place that opened doors for us. It grounded us in hard work and made us problem solvers."

Other graduates in the group they teasingly call BTCrew, or Brain Trust Crew, include Bill Rogers B.S.M.E. '71; John Kelly B.S.C.E. '71; Wayne Garrison B.S.M.E. '71; Larry Robertson B.S.Ch.E. '71; Ken Rogers B.S.Ch.E. '71; and Kinch Meyer B.S.I.E. '72. Two more, Bob May B.S.Ch.E. '71; and John Oldner B.S.Ch.E. '70 M.S.Ch.E. '72, could not make chis trip.

The degrees drove members of the group to work in a great variety of roles as financial managers, CEOs, energy executives, insurance company managers, company owners and international consultants. "Engineering is a solid foundation to enter the workplace and achieve success in many areas outside of pure engineering," Robertson said.

Among the activities the group attended during their trip was a reception of the College of Engineering's Dean's Advisory Council at Carnall Hall. It was a big deal to these old guys, Abell said, and they dressed in suits and ties for the occasion. The group presented checks to College of Engineering Dean Kim Needy to augment the Ralph Evans Scholarship Fund. "We are so grateful to these gentlemen for their contributions to engineering over the course of their careers. As with all of our students, their success is our success," Needy said. "Even more, we thank them for their generosity in remembering their friend and the great help this will be to the students who benefit from the Ralph Evans scholarship."

For information about contributing to scholarship programs in the College of Engineering, contact Bill Lansden, senior director of development and external relations, at blansden@uark.edu.

By Jennifer Cook, Director of Communications
College of Engineering
Adapted from the Arkansas Alumni Association Magazine

Alumnus Elected Vice Chancellor

Marco Barker is serving as the inaugural vice chancellor for diversity and inclusion and associate professor of practice at the University of Nebraska-Lincoln. Prior to UNL, he served as chief diversity officer at Westminster College in Salt Lake City. Barker is also founder and associate for Barker Diversity Consulting, a diversity strategic leadership firm. His scholarship includes cross-race advising, doctoral education and diversity leadership in higher education.

Barker is a graduate of Leadership Triangle and Leadership Utah and has also been recognized as a Utah Business Forty Under 40. He has served on the Utah MLK Human Rights Commission and Key Bank Utah Advisory Board and currently serves on the Lincoln 2050 Forward planning committee, Lincoln Community Foundation board and NCAA governance diversity committee.

His contributions to the University of Arkansas have included serving as an admissions ambassador for the Arkansas Alumni Association, a member of the Arkansas Libraries Capital Campaign Committee, a board member and current president-elect for the Black Alumni Society. His direct impact on the University of Arkansas included starting an Arkansas Black Alumni Society Facebook page, co-leading fundraising efforts for Black engineering students – resulting in an endowed scholarship; participating in diversity, equity and inclusion outreach efforts to reach prospective students; and serving on the BAS Ad Hoc Committee focused on advancing campus climate, enrollment, work-life and student retention.

Barker earned his Bachelor of Science in Industrial Engineering from the university in 2000. He has also earned a Master of Business Administration from Webster University and a doctoral degree in educational leadership and research from Louisiana State University. He was one of seven alumni in the class of 2022 to be inducted into the Arkansas Academy of Industrial Engineering.

Alumnus and Associate Dean Recipient of Purvis Award

Bryan Hill, associate dean for student success in the College of Engineering, was one of three members of the University of Arkansas community to receive the 2021 Hoyt H. Purvis Award for Service in International Education from the University of Arkansas Graduate School and International Education (GSIE). The award recognizes members for their outstanding service to the field of international education. An alumnus of the industrial engineering program, Hill has led the international efforts in the College of Engineering and has also been an integral part of several joint efforts with GSIE to bring international students to our campus and to send domestic students abroad.

Hill began a program that allowed engineering students to spend a semester abroad without losing degree progress. As a result, the number of engineering students studying abroad grew from an average of eight per year to nearly 50 per year.

"Dean Hill exemplifies collaboration, leadership and a commitment to the international education community," former graduate school dean, Pat Koski said. "He has worked within Engineering and across other units to promote international education in a way to benefits students and our University."

International Excellence Fellowship from Karlsruhe Institute of Technology

Jennifer Pazour, an associate professor in the Department of Industrial and Systems Engineering at Rensselaer Polytechnic Institute, has been awarded an International Excellence Fellowship from the Karlsruhe Institute of Technology (KIT) in Karlsruhe, Germany.

This competitive award will allow Pazour, a leading expert in the use of mathematical models to guide decision making in supply chain and logistics challenges, to collaborate on site with KIT researchers in a three-month stay in the fall of 2022.

The research partnership will develop new approaches to design omni-channel facilities that support pleasant shopping experiences and efficient e-commerce order fulfillment and reduce the strain on mobility and freight transportation systems.

In addition, Pazour hopes to "explore further collaborative ventures between RPI and KIT — two leading global technology institutions."

Pazour was selected by the Council for Research and Young Scientists at KIT based on the breadth of her previous scientific achievements and the originality and innovation of the proposed research project, among other criteria.

The International Excellence Fellowships were established by KIT to strengthen renewal capability and top-level research, expand its network to strengthen international recruiting and to support strategic cooperation with international top-level universities and research institutions.

Pazour serves on the Department of Industrial Engineering Liaison Committee, which serves in the capacity of an advisory board to the department. The committee is comprised of accomplished professionals from business, industry and academia who bring both an applied perspective and an independent assessment to our program.

Alumna Recipient of Hall of Fame Award

Lauren Kegley, Kim Needy, L. Lee Johns Lane and Pam McGinnis

College of Engineering alumni, faculty, staff and guests gathered Saturday, April 9, 2022 to induct two new members into the college's Hall of Fame and recognize 18 graduates with Distinguished Alumni and Early Career awards.

The black-tie event featured dinner and an awards ceremony led by Dean Kim Needy and co-hosts Pam McGinnis and Lauren Kegley, with remarks by U of A interim Chancellor Charles Robinson. McGinnis is chair of the college's Dean's Advisory Council and Kegley is chair of the Early Career Advisory Council.

The industrial engineering inductee to the Hall of Fame was L. Lee Johns Lane (M.S.O.R. '74, Ph.D. Engineering '76), retired vice-president and co-owner of Autek Systems Inc., a privately held defense company. Lane was the first woman to earn a doctoral degree from the College of Engineering and became the first woman named to the Hall of Fame on Saturday. She began her career teaching computing before being recruited by General Dynamics to guide engineers in using databases. She continued working in aerospace, including the then classified B-2 bomber program and co-founded the defense company Autek Systems.

College of Engineering Dean, Kim Needy noted the significance of Lee's induction at the same time women are serving as the college's dean and chairs of its advisory councils. "It's truly a historic moment for the college as we strive to be more inclusive and to recognize women's contributions in engineering," Needy said. "Lee paved the way for me and for women succeeding in disciplines once considered not to be suited for us."

Graduates were also honored with Distinguished Alumni Awards: Jeff Amerine, M.S.O.M. '09; Chuck Tilmon, B.S.I.E. '94, M.S.I.E. '96 were the industrial engineering winners. Early Career Alumni Awards were also presented and the industrial engineering recipients were: Tola Kumolu, M.S. Telecommunications '07, M.S.O.M. '09; Lauren Lowe, B.S.I.E. '07 and Derek Martin, M.S.O.M. '13.

Arkansas Academy of Industrial Engineering Inducts New Members

The pandemic may have dampened our days, but not our spirits at the 2021 induction of the Arkansas Academy of Industrial Engineering. Though we were unable to host the event in person in 2020 or 2021, the event went on virtually in fall 2021 and the classes of new inductees were officially installed for 2020 and 2021.

The class of 2020 included eight:

- Alex Andelman, B.S.I.E. '03, M.S.I.E. '05
- Bonnie Boardman, B.S.I.E. '91, Ph.D. '97
- Ryan Daniels, B.S.I.E. '01, M.S.I.E. '03
- Thomas Duncan, B.S.I.E. '05
- Willie Montgomery III, B.S.I.E. '04, M.S.I.E. '09
- Chase Rainwater, B.S.I.E. '04
- David Rieske, B.S.I.E. '03, M.S.I.E. '05
- Nia Wright, B.S.I.E. '93

The class of 2021 included five:

- Andres Angulo, B.S.I.E. '94, M.S.I.E. '02
- Jennifer Cross, B.S.I.E. '01
- Leigh Ann Fulkerson, B.S.I.E. '01
- Jenni Kimpel, B.S.I.E. '06
- Kyle Kimpel, B.S.I.E. '06

The A.A.I.E. faculty and staff awards presented included the 2021 Faculty Member of the Year which went to Xiao Liu, assistant professor

and two other awards the Administrative Staff Member of the Year to Ashley Reeves, Assistant to the Department Head and the Support Staff Member of the Year award which went to Tamara Ellenbecker, Media Specialist.

In 2022 we were able to return to an in-person event and the festivities were held at the Holiday Inn Convention Center in Springdale, Arkansas on April 8. Over one hundred were in attendance as we recognized those who had given to our scholarship funds, faculty and staff awards and induction of seven new members.

The 2022 class of inductees:

- Marco Barker, B.S.I.E. '00
- Cristin Glover Groce, B.S.I.E. '05
- Roger Ha, B.S.I.E. '05
- Ilyas Iyoob, B.S.I.E. '03, M.S.I.E. '04
- Douglas Mettenburg, M.S.I.E. '07
- David Storms, B.S.I.E. '97
- Carol Choi Wolf, B.S.I.E. '03

The A.A.I.E. 2022 Faculty Member of the Year award went to Chase Rainwater, professor and Associate Department Head. The Administrative Staff Member of the Year award went to Carol Altom, Assistant Director of the Master of Science in Operations Management program and the Support Staff Member of the Year award went to Jarvis Roberts, Scientific Research Technologist.

Arkansas Academy of Industrial Engineering Class of 2022 Inductees
Back: Douglas Mettenburg, David Storms, Marco Barker
Front: Cristin Glover Groce, Ilyas Iyoob, Carol Choi Wolf, Roger Ha

LIAISON COMMITTEE

The Arkansas Academy of Industrial Engineering was founded in 1986 to recognize the achievements of University of Arkansas industrial engineering graduates and to provide continuing guidance and support to the Department of Industrial Engineering. The Academy also provides its members with the opportunity to nurture the organization that played an important role in their professional growth and development. Academy members provide tremendous financial resources that endow many scholarships for the industrial engineering students.

The A.A.I.E. organizes a Liaison Committee that serves an advisory board and meets annually to evaluate the department. The committee is comprised of accomplished professionals from academia, business and industry who bring both an applied perspective and an independent assessment to the Department of Industrial Engineering.

It is the opinion of this year's Liaison Committee that the department's culture remains healthy and strong even through the last two years with the pandemic. The family nature of the faculty is unique in this department. It continues to make an impact on the students and the overall success of the department. It is easily observed that the faculty and staff highly respect and genuinely care for each other and for the future of the department. Overall, the committee believes the department continues to shine and evolve to support student needs and industry needs.

Members of the 2022 Liaison Committee

- Karen Jewell, Chair of Committee is Vice President of Engineering and Technology at J.B. Hunt Transport Services, Inc. Jewell is also the current President of the Arkansas Academy of Industrial Engineering.

- Stu Garrett, Business Development Manager, Aviation & Federal at Burns & McDonnell and current president of the Arkansas Academy of Industrial Engineering.

- David Humphrey, Vice President of Investor Relations for ArcBest in Fort Smith, Arkansas.

- Bill Klimack, Retired U.S. Army Officer, Former Department Head at West Point, Decision Analysis Manager at Chevron (Retired 2020).

- Gül E. Kremer, Professor and Chair of the Department of Industrial and Manufacturing Systems Engineering at Iowa State University.

- Willie Mongtomery, III, Senior Director of Data Science in Supply Chain Analytics with Walmart Inc.

- Jen Pazour, Associate Professor of Industrial and Systems Engineering at Rensselaer Polytechnic Institute (RPI).

- Tarek Taha, Sr. Director Engineering & Technology with J.B. Hunt.

- Eileen Van Aken, Professor and Department Head of the Grado Department of Industrial and Systems Engineering at Virginia Tech.

- Martha Wolf, Principal Network Design Engineer at AT&T and President-Elect of the Arkansas Academy of Industrial Engineering.

LABORATORY AND SPACE OVERVIEW

The Industrial Engineering Department has three physical computer laboratories for student use. These are the Foust Lab (BELL 4127-4128), Stephens Lab (BELL 4134A) and a general access computer lab shared with Civil Engineering (BELL 4133). All are equipped with the latest hardware, software and specialized programs.

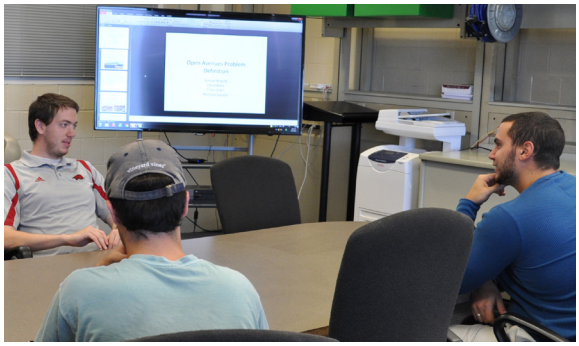
David D. and Nancy J. Foust Computation Laboratory

The Foust Computation Laboratory is industrial engineering's premier computing and teaching lab, providing general computing access for all students and supports the computing needs associated with course work. Included in the lab are a project area with whiteboards to encourage student discussions. Occupying approximately 2,100 square feet, the computer lab area can accommodate 44 students.

The Department is committed to providing the latest in computer technology, software capability and technical expertise to enhance the educational experience for all students. The Foust Computation Lab is open 24 hours a day throughout the semester to all faculty, staff and students enrolled in industrial engineering classes.

Capstone Experience Lab

Used primarily for students in the Industrial Engineering Capstone Experience course, the space is equipped with a conference area, mobile media cart with a 60" television monitor, computer and conference phone. This enables students to meet with industry partners, review draft versions of course milestones and make presentations of project results.



Larry and Gwen Stephens Undergraduate Research Laboratory

The Larry and Gwen Stephens Undergraduate Research Lab provides state-of-the-art facilities including the latest computer hardware and software designed for industrial engineering projects.

The lab provides individual workspace for up to 15 undergraduate students. To be eligible for a space in this lab, a student must be engaged in research with an industrial engineering faculty member.

Multi-Purpose Teaching Lab

This lab supports two undergraduate courses, Methods & Standards and Ergonomics. The space is used to the hold lab meetings for these two courses where students conduct experiments related to cognitive ergonomic concepts, hand tool design, anthropometric measurement, time studies, work sampling, worksite analysis and design. The space also features a conference area where student teams can meet to discuss research.

The Bill and Margaret Harrison Family Video Conferencing Facility

The Bill and Margaret Harrison Family Video Conferencing Facility was made possible by a contribution from alumni William and Margaret Harrison of Little Rock.

The paramount feature in the facility is the state-of-the-art software and equipment. The facility is equipped with LifeSize 220 Express, described as the most full-featured video conferencing system available.

The system allows remote video and audio communication between up to eight parties concurrently. Users can share content, control cameras, change layouts and add participants with ease. It includes an application for smart phones, tablets and computers and has the ability to record meetings and stream viewing.

The AT&T Manufacturing Automation Laboratory

The Manufacturing Automation Lab allows students to gain hands-on experience with technologies that boost manufacturers' efficiency and agility. This includes both robotics and additive manufacturing.

The lab hosts two traditional robotic work cells. The vision-equipped Adept Cobra is a 4-axis SCARA geometry that is ideal for high-speed pick-and-place operations. The other work cell features an Adept Viper 6-axis articulated arm mounted on a 2-axis Adept

Python Cartesian robot. This is a common arrangement in industry for manufacturing tasks such as robotic welding and machine loading/unloading.

The lab also features two collaborative robots: Baxter from Rethink Robotics and a UR10 from Universal Robots. Both are intrinsically safe and possess human-friendly task specification, allowing humans to enter the work envelope and interact with the robots. With two seven-axis arms, integrated machine vision and an interactive display, Baxter can handle complex perception and manipulation tasks.

The UR10 is a traditional 6-axis articulated arm. Together they represent the next generation of industrial robotics.

The Turtlebot mobile robot from Clearpath Robotics is the lab's fully autonomous robot that gives students experience with the simultaneous localization and mapping (SLAM) technologies used in both industrial mobile robotics and autonomous vehicles.

Additionally, the lab stays particularly active in the realm of Additive Manufacturing. The Stratasys uPrint is an industrial-grade fused deposition modeling (FDM) 3D printer. Further enhancing exposure to this type of manufacturing is the lab's MakerGear M2 desktop 3D printers, Simplify3D printing software, and Autodesk Inventor CAD software to provide low-cost, hands-on 3D printing experience for students.

Reliability and Intelligent Systems Engineering (RISE) Laboratory

In the Reliability and Intelligent Systems Engineering (RISE) Laboratory, research efforts are being taken to create holistic tools that will enable accurate reliability estimation, proactive control of product reliability and operational adjustments to adaptively coordinate product reliability and service logistics, so that the overall uncertainty can be reduced more effectively and globally.

To estimate and improve product reliability, different types of reliability tests at material and component levels can be conducted. The application areas of our theoretical and experimental studies include microelectronics, machine tools, electromechanical components and nanomaterials. The lab at the UofA's Engineering Research Center houses a combined environmental testing facility that provides a product designer with a full spectrum of analysis on the potential failure modes as well as lifetime and/or degradation data.

The team has developed a collection of generic models and tools for analyzing accelerated life or degradation testing data involving complex covariates. Moreover, their previous research on reducing the energy consumption of such reliability tests will make the implementations of testing strategies and data analysis more attractive.

Indeed, by precisely knowing the reliability of a product under different and time-varying operating conditions, prognostics, condition-based maintenance and proactive service logistics can be carried out more effectively than ever before.

The other research focuses of this research lab are on data analytics in advanced manufacturing (e.g., additive manufacturing), energy systems and healthcare.

To learn more about the RISE Laboratory, please contact liao@uark.edu

System Design and Analytics Laboratory

The University of Arkansas, Department of Industrial Engineering has been at the forefront of engineering resilient systems using Set Based Design (SBD). Greg Parnell leads the System Design and Analytics Laboratory (SyDL) which currently includes five professors and several graduate students.

The team has pioneered new methodologies efficiently exploring trade-space and analyzing trade-offs using SBD. Together they provide world-class expertise in decision analysis, engineered system resilience, system reliability and trade-off analytics. With over 50 years of combined military acquisition experience, our team also has access to industry standard software. The System Design and Analytics Laboratory performs work under the direction of the U.S. Army Engineer Research and Development Center's (ERDC) Institute for Systems Engineering Research with funding from the Engineering Resilient Systems Program, the Department of Homeland Security, the U.S. Corps of Engineers.

The U.S. Army Engineer Research and Development Center helps solve our nation's most challenging problems in civil and military engineering, geospatial sciences, water resources and environmental sciences for the Army, Department of Defense, civilian agencies and our Nation's public good. Their vision is to become the world's premier public engineering and environmental sciences research and development organization.

You can learn more about the
System Design and Analytics Laboratory here:

J.B. Hunt Innovation Center of Excellence (ICE)

The J.B. Hunt Innovation Center of Excellence (ICE) workspace supports innovative research in logistics, technology and business solutions. The work was supported by a grant from J.B. Hunt in 2017. The efforts of the center are led by faculty and student collaborators from the College of Engineering and the Sam M. Walton College of Business (WCOB) in partnership with J.B. Hunt professionals.

ReliaSoft Risk, Reliability and Maintainability Research Alliance Research Alliance

ReliaSoft

ReliaSoft Corporation donated software to the University of Arkansas to form and support the ReliaSoft Risk, Reliability and Maintainability Research Alliance. The software provides engineering students with state-of-the-art tools to help identify potential risks and calculate the severity of disruptions within a manufacturing or transportation environment.

OUR FACULTY

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Ph.D., M.S. (University of California)
B.S. (Princeton University)

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Ph.D. I.S.E (Virginia Tech)
M.S.I.S.E (Virginia Tech)
B.S.I.S.E (Virginia Tech)

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M.S.I.E (University of Pittsburgh)
B.S.I.E. (University of Pittsburgh)

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B.Sc. Math Arkansas State University

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B.S.I.E. (Bogazici University)

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B.S.B.A. (University of Tirana)

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B.Eng. M.E. (Harbin Institute of Technology)

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B.S.I.E. (University of Arkansas)

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M.S.I.E. (University of Pittsburgh)
B.S.I.E. (University of Pittsburgh)

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M.S.I.E. (University of Pittsburgh)
B.S.I.E. (University of Pittsburgh)

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M.S. (University of Southern California)
M.E.I.S.E. (University of Florida)
B.S. (University of New York at Buffalo)

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M.S.R.E. (University of Arizona)
M.S.S.E. (Air Force Institute of Technology)
M.S.E.M. (University of Dayton)
B.S.E.E. (Boston University)

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M.S.S.E. (Air Force Institute of Technology)
B.S.M.E. (Tulane University)

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B.S.I.E. (University of Arkansas)

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and Director of the Data Science Program
Ph.D. (The Ohio State University)
M.S.I.S. (The Ohio State University)
B.S.I.E. (University of Cincinnati)

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and Assoc. Director of the Data Science Program
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B.S.C.E. (University of Arkansas)

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M.S.I.E. (University of Arkansas)
B.S.C.E. (University of Arkansas)

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Ph.D. (University of Florida)
M.S.I.E. (University of Arkansas)
B.S.I.E. (University of Arkansas)

Alan Vazquez
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M.Sc. (Monterrey Institute of Technology)
B.Sc. Math (Autonomous University of Nuevo León)

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Distinguished Professor & Chancellor Emeritus
Ph.D. (The Ohio State University)
M.S.I.E. (Virginia Tech)
B.S.I.E. (University of Arkansas)

Shengfan Zhang, Ph.D.
Associate Professor
Ph.D. (North Carolina State University)
M.I.E. (North Carolina State University)
B.M. (Fudan University, Shanghai)

DEPARTMENT FELLOWS

The title Fellow is used to describe the highest level of membership in most professional societies. Requirements to achieve the level of Fellow vary among organizations. Fellows are typically nominated by other Fellows, have demonstrated exceptional achievement in their field and devoted service to the organization. The Industrial Engineering Department proudly recognizes faculty who have achieved this prestigious status.

American Society for Engineering Education
Kim Needy
John White

American Society for Engineering Management
Kim Needy
Heather Nachtmann
Edward A. Pohl

Institute of Industrial & Systems Engineers
Richard Cassady
Sandra Ekşioğlu
John English
Haitao Liao
Heather Nachtmann
Kim Needy
Edward A. Pohl
Manuel Rossetti
John White

Institute for Operations Research and the Management Sciences
Greg Parnell
John White

International Council on Systems Engineering
Greg Parnell

Lean Systems Society
Greg Parnell

National Academy of Engineering
John White

Military Operations Research Society
Greg Parnell

Society for Decision Professionals
Greg Parnell

Society of Reliability Engineers
Richard Cassady
Edward A. Pohl

SIX WAYS TO PARTNER WITH THE DEPARTMENT OF INDUSTRIAL ENGINEERING

The Industrial Engineering Department at the University of Arkansas works with a wide network of collaborators. Listed below are some of the ways we are working together with the professional community for mutual benefits. We are always eager to explore new and creative ways to team up with you, our alumni and industry friends.

1

INDUSTRY RESEARCH OPPORTUNITIES

IE's faculty and students work with corporations, governmental agencies and other organizations to perform in-context research that provides new knowledge, tools and insights. Your research funding supports the project, provides valuable experience for students that prepares them to directly contribute to your organization and leverages the expertise and resources associated with a major research institution. Our focus is on ensuring that your research funding results in a measurable return on investment to your organization. For more information, contact Dr. Ed Pohl: epohl@uark.edu

PROJECT OPPORTUNITIES

The Capstone Experience Course, provides unique opportunities for companies to partner with students to solve real-world issues companies face. The student teams work closely with the company to identify projects of interest, then work together to identify objectives and ways to achieve desired outcomes. To partner with us, please contact Dr. Ed Pohl at epohl@uark.edu

2

3

MOCK INTERVIEWS

Through the Mock Interview program, sponsored by the Arkansas Academy of Industrial Engineering (AAIE), students are able to interview with actual employers to hone their interviewing skills. Interviewers come from companies that regularly recruit industrial engineers as well as AAIE members. The goal is to help prepare students so they are ready to present themselves in the best possible way at career fairs and job interviews. Contact: aaie@uark.edu

MENTORING CIRCLES

Through the Mentoring Program, IE students are provided with networking opportunities and access to industry professionals with whom they can discuss career opportunities, job expectations and skills and strategies for professional success. Industry mentors are provided the opportunity to share their passion for their profession and help develop the next generation of leaders, while building their own coaching, communication and leadership skills. Contact: aaie@uark.edu

4

5

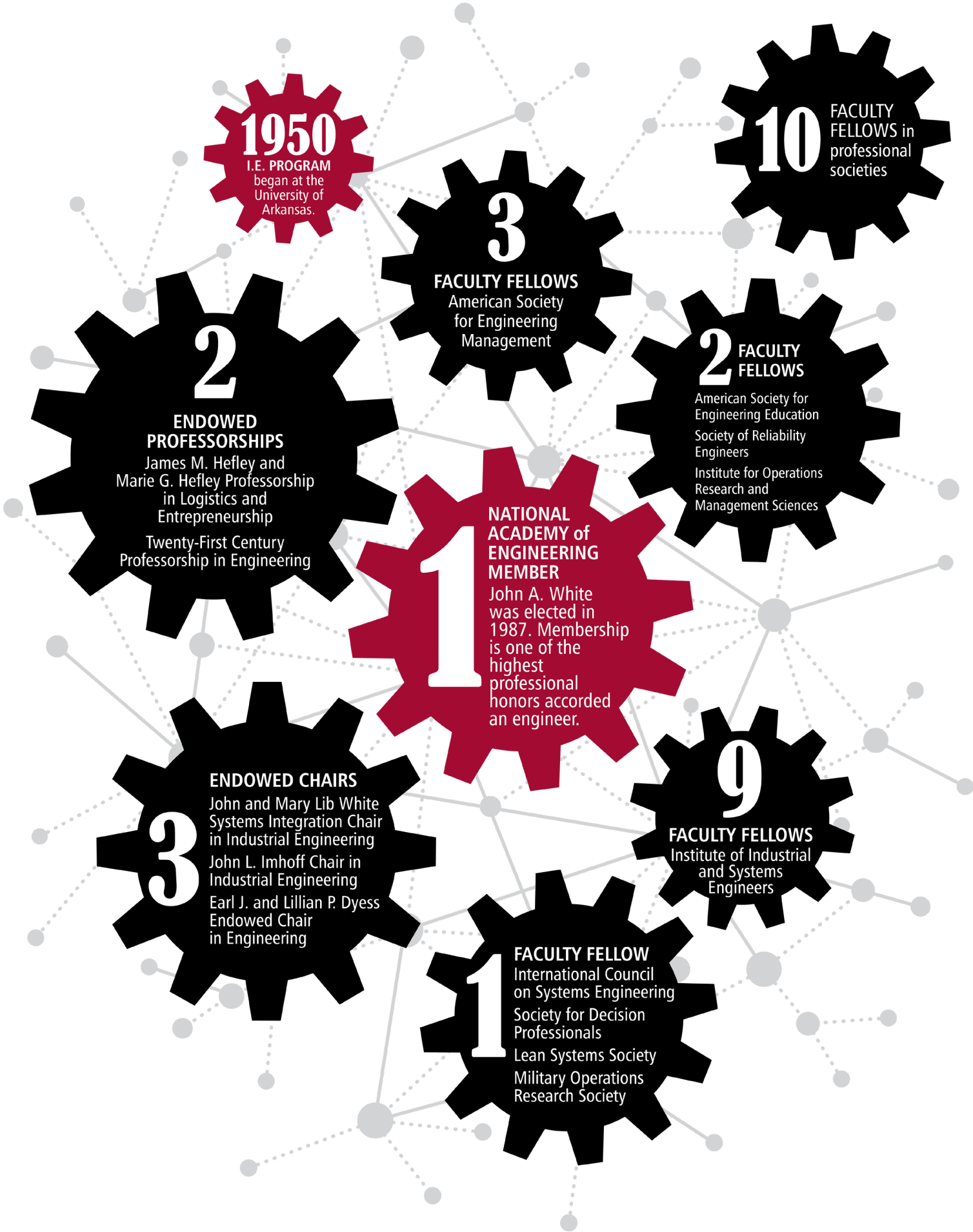
COOPERATIVE EDUCATION AND INTERNSHIPS

Through cooperative education and internships, employers receive the benefit of working with some of the top students in our program. The students gain hands-on experience in the workforce and are able to use their newly acquired skills. Employers also find potential new employees by developing their relationship with the students. Contact: Dr. Jessica Park at jepark@uark.edu

GUEST SPEAKERS

The Industrial Engineering Faculty cannot be available for every single class during a semester. They, like all of us, have conferences to attend as well as family matters that take precedence over work at times. There are also times during a school year that bringing in a guest lecturer can add some variety in substance to a course as well as provide real world experiences that the faculty member may or may not be able to provide. For more information, contact Dr. Ed Pohl: epohl@uark.edu

6


1950
I.E. PROGRAM
began at the
University of
Arkansas.
10
FACULTY
FELLOWS in
professional
societies
3
FACULTY FELLOWS
American Society
for Engineering
Management
2
ENDOWED
PROFESSORSHIPS
James M. Hefley and
Marie G. Hefley Professorship
in Logistics and
Entrepreneurship
Twenty-First Century
Professorship in Engineering
2
FACULTY
FELLOWS
American Society for
Engineering Education
Society of Reliability
Engineers
Institute for Operations
Research and
Management Sciences
1
NATIONAL
ACADEMY of
ENGINEERING
MEMBER
John A. White
was elected in
1987. Membership
is one of the
highest
professional
honors accorded
an engineer.
3
ENDOWED CHAIRS
John and Mary Lib White
Systems Integration Chair
in Industrial Engineering
John L. Imhoff Chair in
Industrial Engineering
Earl J. and Lillian P. Dyess
Endowed Chair
in Engineering
9
FACULTY FELLOWS
Institute of Industrial
and Systems
Engineers
1
FACULTY FELLOW
International Council
on Systems Engineering
Society for Decision
Professionals
Lean Systems Society
Military Operations
Research Society

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WAYS TO GIVE BACK TO INDUSTRIAL ENGINEERING

Would you like to help the Department continue to provide world-class industrial engineering education and relevant, cutting-edge research? Below are some options to do just that!

Annual Giving: Annual gifts to IE are generally unrestricted to help meet the greatest current needs of the department.

Endowments: Endowments are created to provide support into perpetuity. Examples of endowments in IE are scholarships, fellowships, and faculty chairs.

Planned Giving: Planned gifts can be as simple as a bequest (included in your estate plans). Other options include trust vehicles and annuities, which have potential to provide an income stream and significant tax benefits.

Are you ready to help today?

Go to onlinegiving.uark.edu and enter account number: 30003454

Thank you!

For questions concerning giving, please contact:

Bill Lansden • 479-575-3075

UNIVERSITY OF ARKANSAS

College of Engineering
Industrial Engineering

industrial-engineering@uark.edu