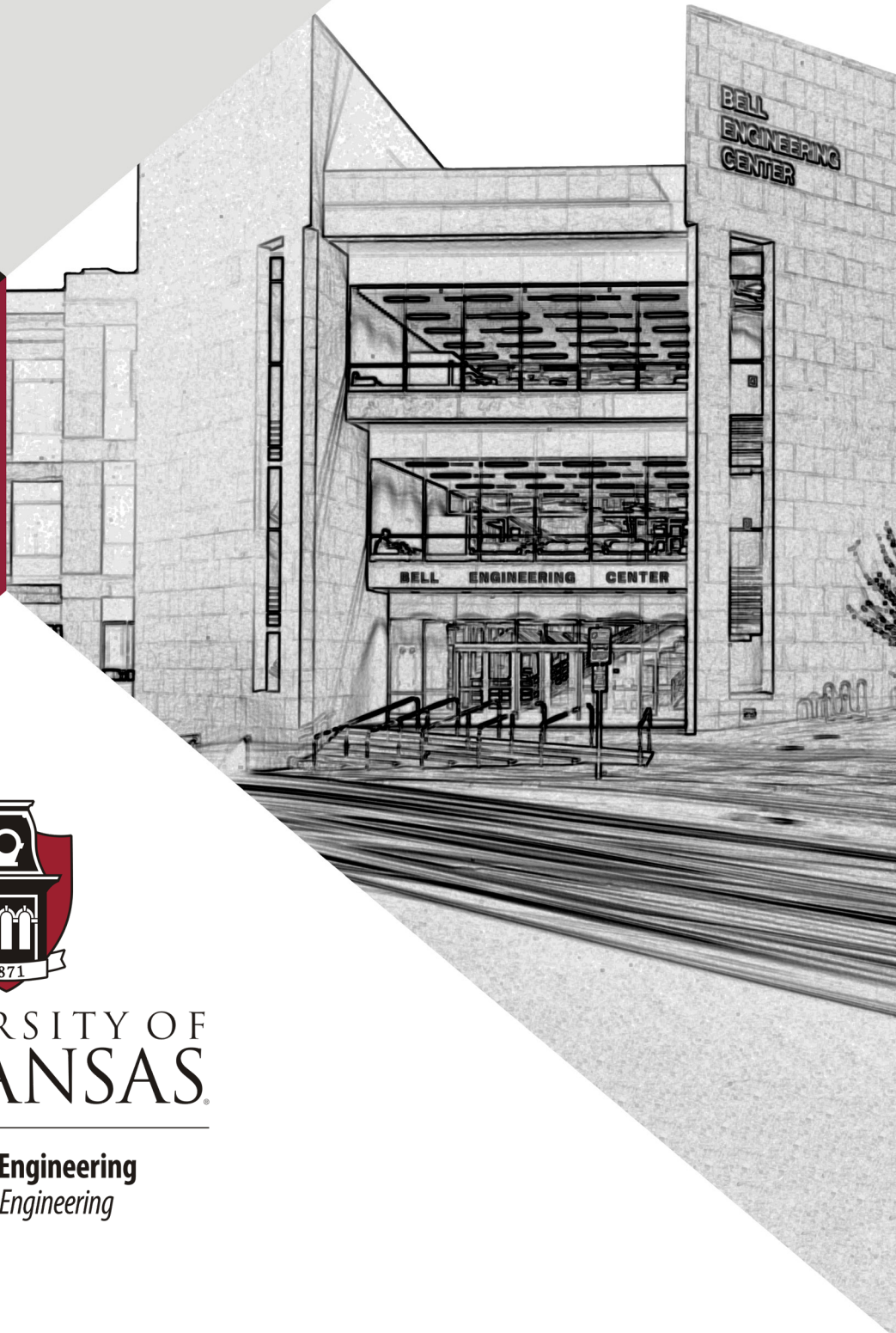
2017

State of The Department Report, 2016-2017

University of Arkansas, Fayetteville. Department of Industrial Engineering.

STATE OF THE DEPARTMENT REPORT

2016-2017



UNIVERSITY OF ARKANSAS

College of Engineering
Industrial Engineering

Department Vision

To be a nationally-competitive, student-centered, Industrial Engineering program serving Arkansas and the world through undergraduate and graduate studies, through leading-edge research programs, through contributions to the profession, and through our unique access to major organizations with world-class logistics and distribution operations. To be a model program providing a broad, personalized undergraduate experience, contemporary graduate and professional programs, and research emphasizing the application of quantitative modeling and analysis. To be leaders in the industrial engineering profession.

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Welcome

Edward A. Pohl, Ph.D. - Department Head

Dear Industrial Engineering Alumni and Friends -

We are eager to share with you some of the events and newsworthy items from the past year. The campus reported enrollment in the fall 2017 term as 27,558! The college and department are experiencing rapid growth as well. There are more than 200 undergraduates (Sophomore-Senior) and over 50 graduate students in our program. Plus, we continue to have strong enrollment in our Master of Science in Operations Management program. In the past year, we were able to establish a new degree program for a Master of Science in Engineering Management, along with a Project Management graduate certificate program.

Research activity is increasing and gaining national recognition with the addition of two new research centers. First, the new collaborative J.B. Hunt Innovation Center of Excellence will provide tremendous research opportunities and will be directed by Chase Rainwater, Ph.D. Second, we have launched an interdisciplinary research program through the Institute for Advanced Data Analytics. W. Art Chaovalitwongse, Ph.D., is the Twenty-First Century Research Leadership Chair and Co-Director of the new Institute for Advanced Data Analytics. His research expertise is in extensive analytics research, ranging from basic computational science and statistics, applied mathematical modeling, and translational research at the interface of engineering, medicine, and other emerging disciplines. Chaovalitwongse holds a Ph.D. and M.S. in Industrial & Systems Engineering from the University of Florida. He is a recipient of the 2006 National Science Foundation CAREER Award and serves as President for the Association of Thai Professionals in America and Canada (ATPAC).

Adding to our research breadth are three more faculty members. Joe Geunes, Ph.D., was hired as the John and Mary Lib White Systems Integration Chair. His research areas include production and logistics planning, supply chain management, and operations research. He earned his Ph.D. from Penn State and is an IISE Fellow.

Carrie Beam, Ph.D., is our newest Clinical Assistant Professor. She is working primarily with our MSOM program. Her degrees include a Ph.D. and M.S. in Industrial Engineering and Operations Research, from the University of California, Berkeley, and a B.S. in Civil Engineering and Operations Research from Princeton University.

And finally, we will welcome Xiao Liu, Ph.D. as an Assistant Professor for fall 2017. Liu holds a Ph.D. in Industrial and Systems Engineering from the National University of Singapore. He also brings industry experience as a former researcher with the IBM Thomas J. Watson Research Center.

Please enjoy reviewing our report and contact us if you have any questions.

Sincerely,

Edward A. Pohl, Ph.D.
Department Head and
21st Century Professor of Industrial Engineering

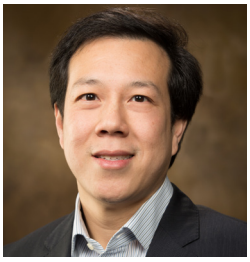
Faculty

C. Richard Cassady, Ph.D.

Professor

Dr. Cassady serves as Director of Freshman Engineering and Director of the Honors Program for the College of Engineering. For the Department of Industrial Engineering, Dr. Cassady teaches the introductory industrial engineering course and coordinates the capstone experience. He also teaches courses probability and stochastic processes. Dr. Cassady serves as Co-Director of FIRST LEGO League for the state of Arkansas. He is a Fellow of the Institute of Industrial and Systems Engineers and the Society of Reliability Engineers. He joined the faculty in 2000.

Education:
Ph.D. Industrial and Systems Engineering (Virginia Tech)
M.S. Industrial and Systems Engineering (Virginia Tech)
B.S. Industrial and Systems Engineering (Virginia Tech)



W. Art Chaovalitwongse, Ph.D.

Professor, and 21st Century Research Leadership Chair

Dr. Chaovalitwongse's research group conducts extensive Analytics research, ranging from basic computational science/statistics, applied mathematical modeling, and translational research at the interface of engineering, medicine, and other emerging disciplines. He joined the faculty in 2016.

Education:
Ph.D. Industrial Engineering & Systems Engineering (University of Florida)
M.S. Industrial Engineering & Systems Engineering (University of Florida)
B.E. in Telecommunication Engineering (King Mongkut Institute of Technology)

Justin R. Chimka, Ph.D.

Associate Professor

Dr. Chimka is director of graduate programs in industrial engineering. His research interests include statistical modeling, monitoring, and detection. He teaches courses in applied statistics, production, and operations analysis. Dr. Chimka joined the faculty in 2002.

Education:
Ph.D. Industrial Engineering (University of Pittsburgh)
M.S. Industrial Engineering (University of Pittsburgh)
B.S. Industrial Engineering (University of Pittsburgh)

John R. English, Ph.D., PE

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

Dr. John English's research focuses on quality and reliability engineering. He has published numerous articles and book chapters in the field of logistics and material handling. His awards include the Halliburton Research Award, the Dr. Theo Williamson Award from *Integrated Manufacturing Systems* and the Continuing Professional Development Best Paper Award from the American Society for Engineering Education. He is a fellow of the Institute of Industrial and Systems Engineers. Dr. English returned to the college in 2013.

Education:
Ph.D. Industrial Engineering and Management (Oklahoma State University)
M.S. Operations Research (University of Arkansas)
B.S. Electrical Engineering (University of Arkansas)

Carol S. Gattis, Ph.D.

Adjunct Associate Professor, and Associate Dean Emeritus of the Honors College

Dr. Gattis remains involved in several areas: undergraduate research, international education, service learning, k-12 math and science education, student recruitment and retention, and diversity. She currently serves as the Associate Dean Emeritus of the Honors College. Dr. Gattis joined the faculty in 1991.

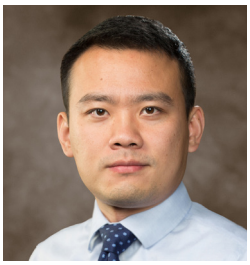
Education:
Ph.D. Engineering (University of Arkansas)
M.S. Electrical Engineering (University of Arkansas)
B.S. Electrical Engineering (University of Arkansas)

Joseph Geunes, Ph.D.

Professor, and John and Mary Lib White Systems Integration Chair in Industrial Engineering

Dr. Geunes is an active researcher in the area of production and logistics planning, supply chain management, and operations research. He joined the faculty in 2016.

Education:
Ph.D. and M.B.A. (Penn State University)
B.S. Electrical Engineering (Drexel University)



Xiao Liu, Ph.D.

Assistant Professor

Dr. Liu's research focuses on engineering probability and statistics, spatio-temporal modeling, big data analytics, and various engineering-knowledge-based data-driven methodologies in broad areas such as quality and reliability, manufacturing yield prediction, preventive maintenance, urban air quality modeling, and extreme weather events prediction. He joined the faculty in 2017.

Education:
Ph.D. Industrial Engineering (National University of Singapore)
B.Eng. Mechanical Engineering (Harbin Institute of Technology)

Haitao Liao, Ph.D.

Professor, James M. Hefley and Marie G. Hefley Professor in Logistics and Entrepreneurship

Dr. Liao's research interests include reliability models, maintenance and service logistics, prognostics, data analytics, design of experiments, and probabilistic risk assessment. In his research, he focuses on the use of theory of probability, statistics, operations research, signal processing tools in reliability estimation and improvement of highly reliable products, and optimization of service and operation of engineering systems. He joined the faculty in 2015.

Education:
Ph.D. Industrial and Systems Engineering (Rutgers University)
M.S. Industrial and Systems Engineering (Rutgers University)
M.S. Statistics (Rutgers University)
B.S. Electrical Engineering (Beijing Institute of Technology)

Ashlea Bennett Milburn, Ph.D.

Assistant Professor and John L. Imhoff Chair in Industrial Engineering 2017-2018

Dr. Milburn's research interests include applying operations research tools and techniques to problems encountered in healthcare, humanitarian and transportation systems. She is especially motivated by the modeling and analysis of challenges associated with disaster relief and the delivery of home healthcare. Dr. Milburn teaches courses in probability and statistics, healthcare systems, and transportation logistics. She joined the faculty in 2010.

Education:
Ph.D. Industrial and Systems Engineering (Georgia Tech)
M.S. Industrial and Systems Engineering (Virginia Tech)
B.S. Industrial Engineering (University of Arkansas)

Heather Nachtmann, Ph.D.

Professor, and Associate Dean of Research, College of Engineering

Dr. Nachtmann serves as the Director of the Maritime Transportation Research and Education Center and the Mack-Blackwell Transportation Center. Her current research program focuses on economic and decision analysis of transportation systems focusing on inland waterways. She has taught courses in engineering economy, cost analysis, and decision modeling. She joined the faculty in 2000.

Education:
Ph.D. Industrial Engineering (University of Pittsburgh)
M.S. Industrial Engineering (University of Pittsburgh)
B.S. Industrial Engineering (University of Pittsburgh)

Kim LaScola Needy, Ph.D., PE, CFPIM, PEM

Professor & Dean, Graduate School and International Education

Dr. Needy's research interests include engineering management, engineering economic analysis, sustainable engineering, and integrated resource management. She has taught courses in project management and industrial engineering design. Dr. Needy joined the faculty in 2008.

Education:
Ph.D. Industrial Engineering (Wichita State University)
M.S. Industrial Engineering (University of Pittsburgh)
B.S. Industrial Engineering (University of Pittsburgh)

Sarah Nurre, Ph.D.

Assistant Professor

Dr. Nurre's current research interests are in applying network optimization, scheduling, integer programming, and optimization algorithms to relevant applications such as infrastructure restoration, multi-layer interdependent network protection, vehicle routing for the military and public sector, and the integration of electric vehicles with a smart grid. She joined the faculty in 2015.

Education:
Ph.D. Decision Sciences and Engineering Systems (Rensselaer Polytechnic Institute)
M.E. Industrial and Management Engineering (Rensselaer Polytechnic Institute)
B.S. Mathematics (Rensselaer Polytechnic Institute)

Gregory S. Parnell, Ph.D.

Research Professor of Industrial Engineering and Director of the M.S. in Operations Management and M.S. in Engineering Management Programs

Dr. Parnell's research interests include decision analysis, systems engineering and resource allocation in the areas of defense, national security, homeland security, and R&D planning. He teaches courses in decision models, systems engineering, project management, operations management, and industrial engineering design. He joined the faculty in 2013.

Education:
Ph.D. Engineering-Economic Systems (Stanford University)
M.S. Systems Management (University of Southern California)
M.E. Industrial & Systems Engineering (University of Florida)
B.S. Aerospace Engineering (State University of New York at Buffalo)

Harry A. Pierson, Ph.D.

Assistant Professor

Dr. Pierson's research interests include collaborative robotics and agile automation. Applications include distribution center operations and low-volume, high-mix manufacturing environments. Additionally, he conducts research in additive manufacturing (commonly referred to as 3D printing). Dr. Pierson teaches courses in applied robotics and manufacturing processes. He joined the faculty in 2014.

Education:
Ph.D. Industrial and Systems Engineering (The Ohio State University)
M.S. Engineering Management - Manufacturing Engineering (University of Missouri-Rolla)
B.S. Mechanical Engineering (University of Missouri-Rolla)

Edward A. Pohl, Ph.D.

Professor, Department Head & 21st Century Professor of Industrial Engineering

Dr. Pohl's research interests include reliability and risk analysis, large-scale systems engineering and analysis, probabilistic design, engineering optimization, and supply chain analytics. He teaches courses in quality control, engineering statistics, non-linear programming, heuristics, risk modeling, systems engineering, project management, global engineering, and innovation. Dr. Pohl joined the faculty in 2004.

Education:
Ph.D. Systems and Industrial Engineering (University of Arizona)
M.S. Reliability Engineering (University of Arizona)
M.S. Engineering Management (University of Dayton)
M.S. Systems Engineering (Air Force Institute of Technology)
B.S. Electrical Engineering (Boston University)

Letitia M. Pohl Ph.D.

Clinical Assistant Professor

Dr. Pohl serves as the undergraduate academic advisor. Her interests include facility logistics, transportation security, and engineering education. Dr. Pohl teaches courses in engineering economic analysis, operations management, and human factors/ergonomics. She joined the faculty in 2012.

Education:
Ph.D. Industrial Engineering (University of Arkansas)
M.S. Systems Engineering (Air Force Institute of Technology)
B.S. Mechanical Engineering (Tulane University)

Chase Rainwater, Ph.D.

Associate Professor and John L. Imhoff Chair in Industrial Engineering 2015-2016

Dr. Rainwater's research interests lie in the areas of large-scale optimization, integer programming, and supply chain logistics. In addition, he conducts research in areas of healthcare planning, homeland security, and reliability. Dr. Rainwater teaches courses in probability and statistics, optimization, and decision support systems. He joined the faculty in 2009.

Education:
Ph.D. Industrial and Systems Engineering (University of Florida)
B.S. Industrial Engineering (University of Arkansas)

Ronald L. Rardin, Ph.D.

Distinguished Professor Emeritus

Dr. Rardin officially retired in 2013, but remains active teaching for our distance education programs. His research and teaching interests center on large-scale optimization modeling and algorithms, including their application in healthcare delivery, transportation and logistics, and energy planning.

Education:
Ph.D. Industrial and Systems Engineering (Georgia Institute of Technology)
M.P.A. Municipal Administration (University of Kansas)
B.A. Mathematics/Political Science (University of Kansas)

Manuel D. Rossetti, Ph.D., PE

Professor, and Associate Department Head

Dr. Rossetti's research is focused on the design, analysis and optimization of transportation, inventory, healthcare and manufacturing systems, using stochastic modeling, computer simulation, information systems, and heuristic modeling techniques. He teaches courses in the areas of probability modeling, discrete event simulation, object-oriented and database systems, transportation/logistics modeling, and inventory modeling. He serves as the Director of the Center for Excellence in Logistics and Distribution (CELDi) Dr. Rossetti joined the faculty in 1999.

Education:
Ph.D. Industrial and Systems Engineering (The Ohio State University)
M.S. Industrial and Systems Engineering (The Ohio State University)
B.S. Industrial Engineering (University of Cincinnati)

Kelly Sullivan, Ph.D.

Assistant Professor

Dr. Sullivan's research focuses on developing and applying operations research methodology to design systems that are resilient against disruption. His primary research interests lie in the areas of integer programming, network optimization, and reliability. Dr. Sullivan teaches courses in probability and statistics, operations research, and network optimization. He joined the faculty in 2012.

Education:
Ph.D. Industrial and Systems Engineering (University of Florida)
M.S. Industrial Engineering (University of Arkansas)
B.S. Industrial Engineering (University of Arkansas)

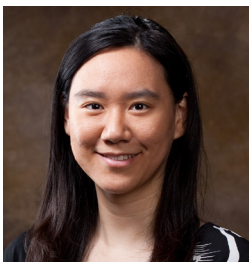
John A. White, Ph.D., PE

Distinguished Professor & Chancellor Emeritus

After serving for eleven years as Chancellor of the University of Arkansas, Dr. White joined the faculty of the Department of Industrial Engineering full-time in 2009. A distinguished alumnus of the department, Dr. White teaches engineering economics, facility logistics, leadership principles and practices, and queueing systems. He directs graduate student research in modeling distribution center facilities and their operations.

Education:
Ph.D. (The Ohio State University)
M.S. Industrial Systems Engineering (Virginia Tech)
B.S. Industrial Engineering (University of Arkansas)

Dr. White also holds honorary doctorates from the Katholieke Universitiet of Leuven in Belgium and George Washington University.



Shengfan Zhang, Ph.D.

Assistant Professor

Dr. Zhang's research interests are mathematical modeling of stochastic systems with an emphasis on statistical and decision analysis as applied to healthcare, manufacturing, and service environments. One of her research goals is to develop methods for addressing the complexity of breast cancer modeling in diverse populations in order to create more personalized screening and treatment strategies. Dr. Zhang teaches courses in advanced stochastic processes, decision modeling in healthcare, and quality engineering and management. She joined the faculty in 2011.

Education:
Ph.D. Industrial Engineering (North Carolina State University)
M.I.E. Industrial Engineering (North Carolina State University)
B.M. Management Science (Fudan University)

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

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

Institute of Industrial & Systems Engineers
Richard Cassady
John English
Joseph Geunes
Heather Nachtmann
Kim Needy
Edward A. Pohl
Manuel Rossetti
John White

International Council on Systems Engineering
Greg Parnell

Lean Systems Society
Greg Parnell

Member of the 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

Undergraduate Studies 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: (1) successfully apply core industrial engineering knowledge and skills for industrial or public sector organizations, (2) successfully pursue advanced professional degrees, graduate studies in industrial engineering, professional training, or engineering certification, and (3) 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 engineering science, computer science, mathematics, physical science, english, economics and other social sciences, humanities, and fine arts. Richard Cassady, Professor of Industrial Engineering, serves as the Chair of Undergraduate Studies.

Students enter our program as sophomores, because all first-year College of Engineering students participate in the Freshman Engineering Program. Directed by Richard Cassady, the Freshman Engineering Program includes two semesters of academic coursework, peer mentoring, professional development, academic advising, and academic assistance programs. Since the Freshman Engineering Program was implemented in 2007, second-year retention (in engineering) of first-year engineering students has increased from approximately 60% to approximately 70%. Roughly 13% of retained Freshman Engineering Program students choose industrial engineering for their sophomore year.

More information on the undergraduate program can be found at http://industrial-engineering.uark.edu/academics/undergraduate-program/index.php.

Capstone Symposium

INDUSTRIAL ENGINEERING Capstone Symposium

The undergraduate senior design course was recently restructured. This new course groups students in teams and matches the team with an industrial partner. Renamed Capstone Experience, every student pursuing the Bachelor of Science in Industrial Engineering at the University of Arkansas is required to complete the two-semester course.

During the 2016-2017 academic year, 51 students participated in the experience as part of 14 teams of three or four students. The student teams were matched with an industrial partner in mid-October. Each team was led by a student project manager and was advised by a member of the industrial engineering faculty. The experience was coordinated by Richard Cassady, Professor of Industrial Engineering.

During the second eight weeks of the fall 2016 semester, the teams conducted stakeholder analysis and background research on their industry partner and the issues that were of interest to that partner. They then developed a detailed understanding of the process or system of interest and obtained the data necessary to conduct a preliminary analysis into the issues faced by the industry.

The teams then conducted extensive data analysis and visualization into the issues faced by the partner and defined meaningful objectives for their work. The performance measures they used to measure their success in achieving the objectives, and the deliverables they would provide to their partner were reviewed, as well as plans for the implementation of recommendations and ongoing decision support.

Each team then identified a detailed list of tasks, including data analysis, mathematical and/or computer modeling, and cost and/or financial analysis, to achieve their project objectives.

During the spring 2017 semester, through performance measures, they assessed their success in achieving the team objectives and created their project deliverables. They also documented information necessary for their industry partner to properly utilize the deliverables.

The experience concluded with a Capstone Symposium. Industry partners and faculty advisors approved each team's Project Final Report and Presentation prior to the symposium. At the symposium, student teams participated in interactive exhibit sessions and delivered detailed technical presentations about their projects.

This year's Capstone Symposium was held on May 3rd in the Verizon Ballroom at the Arkansas Student Union, on the University of Arkansas campus. Students setup their research in an exhibit/poster session fashion and were available to give an overview and answer questions regarding their project.

Presentations were also provided in break-out fashion in rooms adjacent to the ballroom, where students covered the course of their research and recommendations to their industry partner. Each team delivered a 35-minute presentation during one of four concurrent tracks. A 15-minute Q&A session followed each presentation.

Judges were selected from former alumni, industry, faculty, and graduate students to review the presentations and research. During lunch the industry partners, faculty advisors, and judges were recognized.

An awards reception was held at the end of the day in the Ballroom. Students and teams were awarded on their projects in the following categories:

Team Awards

- Project of the Year - ArcBest, *Improving Labor Scheduling while Considering Cost*
- Outstanding Achievement in Data Analysis - LM Wind Power - *Reducing the Cycle Time of the Infusion Preparation Process*
- Outstanding Achievement in Modeling - FedEx Freight - *Maximizing FedEx Freight's Dock Performance through Efficient Work Assignment Methods*
- Outstanding Achievement in Cost/Financial Analysis Tyson Foods, Inc. - *Laying the Foundation for Standardized Work at Tyson Mexican Original*
- Outstanding Achievement in Decision Support J.B. Hunt Transport, Inc. - *Reducing Tractor Cycle Times By Effectively Scheduling Maintenance Technicians*

Individual Awards

- Outstanding Project Manager: Jacob Brosh, Alex Laguarta and Emily May.
- Most Valuable Team Member: Parker Fitzgerald, Tyler Morris, Tanner Woodruff.
- Outstanding Faculty Advisor: Greg Parnell, Manuel Rossetti, Kelly Sullivan.
- Outstanding Industry Partner: Marc Schwartz, Tyson Foods, Inc.; Ankit Sikka, FedEx Freight; Brett Spicer, ArcBest Technologies.

Projects at the 2017 Capstone Experience Symposium:

ABF Freight - *Creating Data Driven Guidelines to Improve ArcBest's Contract Negotiation Process*: Nina Drolc – Project Manager, Elizabeth Carter, Alex Huckabee, Tanner Woodruff

ArcBest Technologies - *Improving Labor Scheduling while Considering Cost*: Alex Laguarta – Project Manager, Stephanie Gibbs, Tyler Morris, Reagan Villarreal

Bimbo Bakeries USA - *Reducing Costs by Improving Efficiency in Product Sorting and Delivery Processes*: David Cox – Project Manager, Levi Finn, Daniel Ramirez, Cristhian Rojas Quintero

FedEx Freight - *Maximizing FedEx Freight's Dock Performance through Efficient Work Assignment Methods*: Elizabeth Schad – Project Manager, Emily Daniel, Brody McDonald, Barth K. Onyekwelu

FedEx Freight - *Enhancing Preventive Maintenance Policy and Performing Asset Failure Analysis*: David Wellendorf – Project Manager, Parker Fitzgerald, Markham Roberson

Frito-Lay - *Optimizing Warehouse Toted Product Flow*: Emerald Cole – Project Manager, Celia Aguilar, Daniel Gomez, Clay Nivens

J.B. Hunt Transport, Inc. - *Recommend an Ideal Fleet Mix of Asset and Non-asset Fleets to J.B. Hunt Management*: Emily May – Project Manager, Lujain Rawwagah, Nick Taulbee, Evan Tillman

J.B. Hunt Transport, Inc. - *Leveraging GPS Pings to Accurately Identify At-Risk Deliveries*: Jacob Hardin – Project Manager, Mario Flores, Eduardo Murillo

J.B. Hunt Transport, Inc. - *Reducing Tractor Cycle Times By Effectively Scheduling Maintenance Technicians*: Daniel Britton – Project Manager, John Tlapek, Logan Wewers

J.B. Hunt Transport, Inc. - *Statistical Process Control for Anomalies in Driver Pay*: Alex Schussler – Project Manager, Lexi Gaddy, Chris Oliver

LM Wind Power - *Operator Scheduling Tool for Volatile Processes*: Shadow Holcomb – Project Manager, Ardraya McCoy, Darius Jordan, Zachary Willis

LM Wind Power - *Reducing the Cycle Time of the Infusion Preparation Process*: Jacob Brosh – Project Manager, Cynthia Bocanegra, Cam Tu Nguyen, Ross Fulmer

Tyson Foods, Inc. - *Laying the Foundation for Standardized Work at Tyson Mexican Original*: Sarah Kiner – Project Manager, Liz Luzcando, Adam Hope, Arturo Nunez

Tyson Foods, Inc. - *Improving Process Monitoring for Tyson Foods, Berry Street*: Grant Holman – Project Manager, Justo Barrios, Hans Maggio

Highlights

UA alumna, Ashleigh Hegwood, spent the 2016 spring semester working as a professional intern in the industrial engineering department at Walt Disney World. Her tasks included making spreadsheets and contributing to studies that analyze data and help determine ways to improve the experience for guests.

"I was able to see the whole operation from a bird's-eye view," Hegwood said. "Industrial engineers often collect data to create a better product for consumers, and Disney prioritizes guests similarly to create a better park experience for them."

Hegwood worked as an intern for Walmart the following June, and after graduating in December she accepted a full-time position with them in Rogers, Arkansas.

"Whenever I interviewed with Walmart for different full-time positions, almost every one of them asked me about Disney on my resume. I think having that work experience helped me stand out in the job market."

Hegwood was one of 71 students selected as Seniors of Significance in fall 2016. The award, given by the Arkansas Alumni Association, recognizes exceptional seniors based upon academic achievement, leadership skills, and substantial extracurricular campus and/or community activities. In addition to Ms. Hegwood, the Department of Industrial Engineering had two other students selected as Seniors of Significance, Salma Boudhoum and Claudia Chavez.

Students named as Seniors of Significance are automatically considered for the distinction of Razorback Classic which comprises the top 11 male or female graduating students at the University of Arkansas. This is the pinnacle of the Arkansas Alumni Association awards program that started in the fall with hundreds of nominations. Ms. Hegwood was also selected as a Razorback Classic.

Outstanding Senior

Senior, David Cox, was selected as the Outstanding Senior. This award is intended to recognize the most outstanding undergraduate industrial engineering student who graduated in fall 2016 or is graduating in either spring or summer of 2017. The nominations are sought from faculty to identify students who excel in academic performance, leadership, service, collegiality, ethics, and dedication

As a member of the University Arkansas band, David participated in marching band, concert band, and the HogWild band. The programs require, on average, a twenty-hour commitment. In 2016 he was selected as Head Drum Major, the highest leadership position in the Razorback Marching Band. Initiated into the band's honor society in 2015, David went on to serve as the sergeant-at-arms and the secretary/treasurer of the Southwest District. On top of all of this, he also excelled in his academic studies. He was selected as the Industrial Engineering ArcBest Corporation Outstanding Freshman in 2014, and was inducted into the industrial engineering honor society, Alpha Pi Mu where he served as social chair. He has completed three summer internships with three different companies, resulting in a full-time job offer from each company. In addition, he completed an honors thesis with Dr. Manuel Rossetti.

Other Undergraduate Achievements

- Salma Boudhoum and Liz Luzcando were co-recipients of the Hytrol Challenge Award, given to industrial engineering seniors for excellence in facility design;
- Sophomore Emily Matlock received the John L. Imhoff Globalization Scholarship from Alpha Pi Mu the Industrial Engineering Honor Society;
- Junior Anthony Woods received the Council of Fellows Institute for Industrial and Systems Engineering Scholarship and the Society for Health Systems Scholarship;
- Junior Justin Taylor received the CISE Scholarship and an Honors College grant to support his research;
- Junior Rachel Holmer was the recipient of the Industrial Engineering Department's 2016 Undergraduate Researcher Award. She also received the UPS Scholarship for Minority Students and coauthored a paper for ISERC 2016. She presented her research at the 2016 INFORMS Annual Meeting and at the REDSET Conference in India. Rachel also presented a poster at the 2016 Jack Buffington Mack-Blackwell Student Poster Session;
- Junior Anna Hudgeons won a State Undergraduate Research Fellowship to support her research;
- Junior Grace McGee was the recipient of the Harold & Inge Marcus Scholarship. Grace was also the recipient of the John L. Imhoff Distinguished Service Award presented by Alpha Pi Mu, and the recipient of an Honors College grant to support her research;
- Senior Alexis Gaddy received an Honors College Research grant and presented her research at INFORMS 2016;
- The departmental Sophomore Scholar Award was presented to Morgan Hartsell;
- Freshman Nathan Clark received the ArcBest Corporation Outstanding Freshman Award; and
- The Northwest Arkansas professional chapter of the Institute for Industrial and Systems Engineering, received the Bronze Award at the annual conference in Pittsburgh, PA.

INSTITUTE OF INDUSTRIAL & SYSTEMS ENGINEERS

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 2016-2017, six undergraduate students completed the Honors College experience in our department.

Student	Honors Thesis Title	Advisor
David Cox	Simulation Modeling of Alternative Staffing and Task Prioritization in Manual Post-Distribution Cross Docking Facilities	Manuel Rossetti
Parker Fitzgerald	Developing Sustainable Rice Production through Image Classification	Kelly Sullivan
Alexis Gaddy	A Quantitative Model for Truck Parking Utilization with Hours of Service Regulations	Sarah Nurre
Cam Tu Nguyen	Exploring the Association Between Patient Waiting Time, No-Shows and Overbooking Strategy to Improve Efficiency in Health Care	Shengfan Zhang
Tanner Woodruff	International Service-Learning in Engineering: A Systematic Literature Review and Mixed-Methods Study	Ed Pohl
Ashleigh Hegwood	Effective Supplier Quality Practices in the Construction Industry	Kim LaScola Needy

Graduate Studies 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 is our professional graduate program in Master of Science in Operations Management and our newest program Master of Science in Engineering Management.

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 (MSIE)
- Doctor of Philosophy in Engineering (PhD)

In addition to traditional degree options, the Department offers a Master of Science in Operations Management (MSOM) and recently added the Master of Science in Engineering Management (MSEM).

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
- Manufacturing & Automation

These areas continue to be supported by research centers and laboratories such as:

- Center for Excellence in Logistics and Distribution
- Mack Blackwell Rural Transportation Center
- Center for Innovation in Healthcare Logistics
- Maritime Transportation Research and Education Center
- ReliaSoft Risk, Reliability and Maintainability Research Alliance
- Arkansas Security Research and Education Institute
- Institute for Advanced Data Analytics

Justin Chimka, Associate Professor of Industrial Engineering, serves as Graduate Coordinator for degree programs in Industrial Engineering. Dr. Greg Parnell serves as Director for the Master of Science in Operations Management and the Master of Science in Engineering Management programs.

More information can be found at http://industrial-engineering.uark.edu

Highlights

Fall enrollment in the Department's doctoral program increased by more than 80% from 2009 to 2016. Fall 2017 PhD enrollment in Industrial Engineering was second largest in the College of

Engineering, and our Department had the greatest number of female doctoral students in the College.

Our graduate students have gained national recognition through awards, honors and publications.

Master's student Luisa Janer Rubio was selected as the recipient of a very competitive Graduate Research Award from the Transportation Research Board for her project *"Simulation Modeling Approach for Evaluating a Solution Designed to Alleviate the Congestion of Passenger Flow at the Composure Area of Security Checkpoints."*

The research stipend is part of the Graduate Research Award Program on Public-Sector Aviation Issues for the academic year 2016-17. The stipend is sponsored by the Federal Aviation Administration of the U.S. Department of Transportation and administered by the Airport Cooperative Research Program of the Transportation Research Board/National Academies.

Rubio's research will be considered for presentation at the January 2018 Transportation Research Board Annual Meeting and for publication in a subsequent volume of the *Transportation Research Record*, the peer-reviewed journal of the Transportation Research Board of the National Academies.

She also presented a conference paper at the Winter Simulation Conference 2016 in Washington D.C. The Alpha Pi Mu Honor Society selected Luisa as the recipient of one of their national level prestigious scholarships.

Other Graduate Achievements

- Doctoral student, Payam Parsa, received a scholarship award from the Material Handling Education Foundation. He published a paper in the *International Journal of Production Economics*, the *2017 IISE Annual Conference Proceedings* and the 2*016 Decision Sciences Institute Annual Conference Proceedings*. He was the recipient of the third-place award in the 2016 IISE doctoral colloquium poster competition, and the best poster award winner at the 2016 CELDi Research Symposium at the University of Missouri. Payam was presented with the Electrification and Controls Manufacturers Association Honor Scholarship by the Material Handling Education Foundation, Inc.

- Doctoral student, Alireza Sheikh-zadeh, coauthored a paper published in *International Journal of Inventory Research*, submitted a paper to *European Journal of Operational Research,* and published a paper in the *Proceedings of ISERC 2016*, Anaheim, CA. He was selected for 2016 IISE Doctoral Colloquium, Anaheim, CA, and for INFORMS 2016 Annual Meeting Doctoral Colloquium. Alireza was selected for the second round of INFORMS 2016 Annual Meeting Poster Competition, and presented his research at ISERC 2016, Anaheim, CA and at INFORMS 2016 Annual Meeting, Nashville, TN. He also received a National Science Foundation Travel Award. Alireza was named by the Undergraduate Class of 2016-2017 as the Outstanding Teaching Assistant.

- Doctoral student, Khatereh Ahadi, presented her research at ISERC 2016 and INFORMS 2016. She was also the recipient of the Jack Buffington Outstanding Student Poster Award at the 2016 Mack-Blackwell Transportation Center advisory board meeting.
- Doctoral student, Liliana Delgado, Hidalgo was the recipient of the 2016-17 John L. Imhoff Scholarship, presented by the Institute of Industrial and Systems Engineers. She was also selected for the Institute for Industrial and Systems Engineering 2016 Doctoral Colloquium. She presented research at ISERC 2016 and coauthored a published journal article.
- Doctoral student, Mohammadhossein Heydari, submitted three journal articles this year and has four articles under review. He presented his research at ISERC 2016 and INFORMS 2016. Mohammadhossein was also selected as the recipient of the Industrial Engineering Department's 2016 Graduate Researcher Award.
- Alireza Sheikh-zadeh and Forough Enayaty were selected as the Outstanding Graduate Students for the 2016-2017 academic year by the faculty of industrial engineering.
- Doctoral student, Hu Eon Lee, won the Best Paper Award in the Facility Logistics Track at ISERC 2016 and presented his research at INFORMS 2016.
- Doctoral student, Rivelino De Icaza, presented his research at the 2016 INFORMS Annual Meeting poster session.
- Doctoral student, Negin Enayaty, presented her research at ISERC 2016 and INFORMS 2016.
- Doctoral student, Amir Ghahari, presented his research at INFORMS 2016 and ISERC 2016.
- Doctoral student, Cesar Ruiz, was selected as a finalist for Best Student Paper in the Quality Control and Reliability Engineering Division of IISE.
- Doctoral student, Fan Wang, coauthored a presentation at the Driving Value Through Innovation in Healthcare Conference.
- Master's student, Adrian Fernandez, presented his research at the Mack-Blackwell Transportation Center Board Meeting.
- Doctoral student Bobby Cottam received the Best Poster Award at the Center for Excellence in Logistics and Distribution (CELDi) Conference at the University of Arkansas in April 2017. He also received the 2nd Place Poster award at the Intelligent Transportation Systems Heartland 2017 Annual Meeting in May 2017.
- Master's student Colin Small was the Best Poster Award Winner at the Center for Excellence in Logistics and Distribution (CELDi) Conference at the University of Arkansas in April 2017.

M.S.O.M. and M.S.E.M. Overview

The Master of Science in Operations Management graduate degree 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 offices. In the 2016-2017 academic year, there were 807 unique students enrolled in the program and a total of 3,161 course enrollments for the year. Eighty-six percent of those enrollments were online courses. The MSOM program continues to be the University's largest graduate program with 193 students completing their degree in the 2016 calendar year.

Operations Management coursework emphasizes practical knowledge in areas such as project management, economic decision-making, supply chain management, human behavior analysis, quality management, and operations research, as well as 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 science of management, and equips graduates to carry out their managerial responsibilities more efficiently and more effectively. Students are able to select from 29 graduate courses to make up the 10 required to complete the degree.

The program is offered at the University of Arkansas's flagship Fayetteville campus, at live Graduate Resident Centers, and via distance learning online. The program is hosted on three active duty bases including Little Rock Air Force Base at Jacksonville, Arkansas; Naval Support Activity Mid-South at Millington, Tennessee; and the Air Force Special Operations Hurlburt Field base at Fort Walton Beach, Florida. These sites, and the option of online classes allow the program to reach a diverse student population among career fields and undergraduate majors.

The MSOM program offers students flexibility by operating in 8-week terms, remaining low cost, and having an online option for most program courses. This flexibility 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 also proud to be affiliated with the military and have many current military members and veterans 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 four IE faculty members actively involved with three additional IE faculty on standby, two full-time MSOM instructors, and 61 adjunct faculty

members who teach in the program. The program recruits business professionals who are academically qualified and have accrued extensive managerial industry experience in the specific subject that they teach.

Admission to the MSOM program requires a student to have a minimum grade-point average of 3.0 either on the last 60 credit hours of attempted baccalaureate coursework, or from all coursework cumulatively from the first conferred baccalaureate degree from a regionally accredited institution. If a student does not have the minimum GPA required, but has at least a 2.5, an accompanying GRE or GMAT score within the 50th percentile or higher, plus a 4.0 analytical writing score will suffice. For admission consideration, students who are not native speakers of English and who do not have a conferred master's degree from an accredited U.S. college or university must submit a 550 paper-based score or an 80 internet-based score on the Test of English as a Foreign Language (TOEFL). Before taking any graduate classes in the Operations Management program, such students must also demonstrate proficiency on one of the following test of written English: TOEFL IBT (26), ELPT (75) or GRE/GMAT (4.0).

A strength of the program is the dedicated instructors and staff members. The program was pleased to award Phil Jones the 2017 Faculty of the Year award at the annual faculty meeting. Phil is a Fayetteville Adjunct Instructor for the MSOM program. He not only does an excellent job in the classroom, leading innovative projects that help the community, but he also attends multiple functions on campus to show his support for the MSOM students and program.

Dr. Matthew Cilli was awarded the 2017 Rookie of the Year award at the annual faculty meeting. Teaching for the MSOM program since spring 2016, Dr. Cilli is the lead course developer for EMGT 5033 Introduction to Engineering Management. This will be the debut course for the Master of Science in Engineering Management graduate program in Fall 2017.

The MSOM program added Carrie Beam as a full-time instructor in spring 2017. Professor Beam lives in the San Francisco Bay Area and is the owner of Beam Consulting, a firm supporting market research. She has been an integral part of redesigning the OMGT 4853 Intro to Decision Support Tools and OMGT 5003 Intro to Operations Management courses as well as the creation of OMGT 5653 Intro to Data Analytics.

MSOM Advisor, Mindy Hunthrop, was awarded the Employee of the Semester and Year award for the College of Engineering for Spring 2017. Mindy is a valuable employee to the department who exemplifies professionalism and passion. She spearheaded an initiative for a Lunch and Learn Webinar Series which has been widely popular. Each webinar features an esteemed MSOM faculty member and a topic that is significant to students and alumni. The series aims to provide further discussion and education for our current students and alumni, while also recruiting new students.

Another strength of the program is a core value of continuous improvement. The motto, "we practice what we teach" guides the program goal to always improve. The MSOM program recently received approval for a Graduate Certificate in Project Management that will begin Fall 2017. The certificate will require three OMGT core classes as well as one elective, and will prepare students to take the Project Management Professional (PMP) exam. Students can work toward the MSOM degree and the certificate program simultaneously.

Additionally, MSOM directors and faculty members created and received approval for an independent degree program. The Master of Science in Engineering Management program will also begin Fall 2017. The curriculum will introduce students to historical and contemporary management theories and provide practical techniques to apply managerial best practices within technical environments. The program is designed for engineers with ABET accredited bachelor's degrees in engineering who want to move into leadership positions in engineering organizations.

In 2016, the MSOM program also implemented a new format for Comprehensive Exams. Students now create a 10 minute video with PowerPoint to showcase the concepts they have learned throughout the program and how those concepts relate to their career path before going in front of the live Comprehensive Exam panel. Since changing to this format, the fail rate has improved from 7% in 2015 to 5% in 2016 and 1% in 2017.

Dr. Richard Ham, MSOM Associate Director, created and taught the inaugural OMGT 5903 Unmanned Aircraft Systems course at the University of Arkansas. This course focuses on the fundamentals of UAS operations and the applications of UAS systems in research, government, and business applications. This course is open to MSOM students, as well as any undergraduate or graduate student at the

University of Arkansas. Twenty-eight students completed the course in its first section and many have expressed interest in wanting to take the course during its next offering. Students are able to learn to fly a drone and piloting a drone successfully is part of the curriculum.

Annual Faculty Meeting

The annual Faculty Meeting was held in July 2017. Over 40 faculty members from all over the United States attended the meeting and several joined in the days preceding to work on course development and to participate in training. Industrial Engineering Department Head, Ed Pohl, started the meeting by welcoming the group to Fayetteville. Vice Provost for Distance Education and Head of the Global Campus, Don Judges, served as Keynote speaker, and Associate Dean of the Graduate School and International Education, Pat Koski, was the dinner speaker.

During the meeting, instructors learned best practices from one another, engaged in a panel discussion with current MSOM students, and received insightful information and updates regarding department plans and online services such as ProctorU. Adam Brown, Instructional Designer with the Global Campus, attended the meeting to be available to instructors to aid in course revamp initiatives. MSOM and MSEM staff members also attended to provide insight from all perspectives.

More information about the Operations Management program can be found here: http://operations-management.uark.edu.

MSOM Faculty and Staff gathered recently at the Fayetteville campus for the annual MSOM Faculty Meeting. Rich Ham snapped a photo of the group with the drone he uses for instruction in our Unmanned Aircraft Systems course.

Laboratories 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. Designated lab space is described in detail below.

David D. and Nancy J. Foust Computation Laboratory

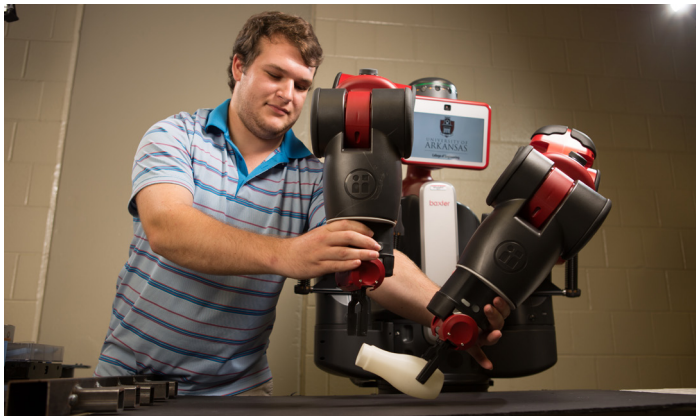
The Foust Computation Laboratory is Industrial Engineering's premier computing and teaching lab, providing general computing access for all students and supports the computing needs associated with course work. Included in the lab are a project area with whiteboards to encourage student discussions.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

The Industrial Engineering 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.

The AT&T Manufacturing Automation Laboratory

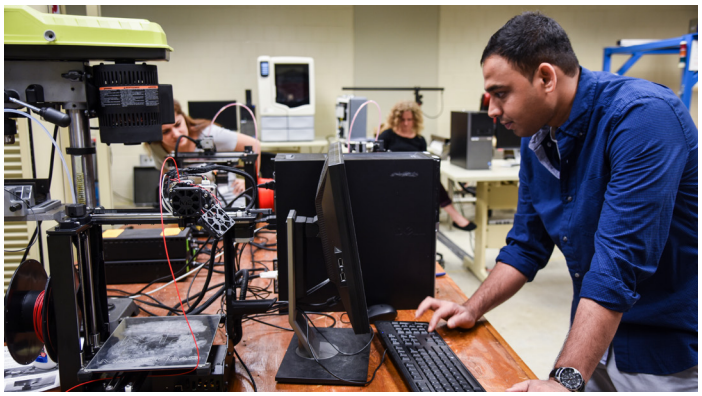
The Manufacturing Automation Lab allows students to gain hands-on experience with technologies that boost manufacturers' efficiency and agility. This includes both robotics and additive manufacturing.

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 UR-10 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 UR-10 is a traditional 6-axis articulated geometry. 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.

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.

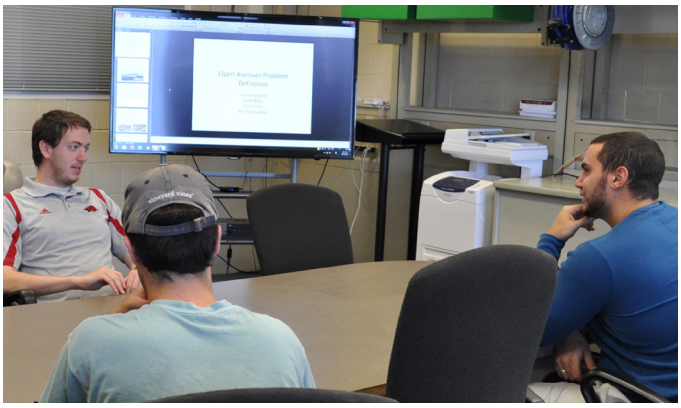
The lab provides individual work space for up to 15 undergraduate students. To be eligible for a space in this lab, a student must be engaged in research with an industrial engineering faculty member.

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, and 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.

Capstone Experience Lab



A dedicated space was developed during the fall 2013 term to be used primarily for students in Industrial Engineering Capstone Experience. The space is equipped with a conference area, mobile media cart with a 60" television monitor, and computer. This enables students to meet with industry partners, review draft versions of course milestones, and make presentations of project results.

Multi-purpose Teaching Lab

This lab supports two undergraduate courses, INEG 3713 Methods and Standards and INEG 4723 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, and worksite analysis and design.

ReliaSoft Alliance Laboratory

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.

More information on the Industrial Engineering Labs can be found at: http://industrial-engineering.uark.edu/Research/Labs/index.php

I.E. Graduates Have Been Hired By...

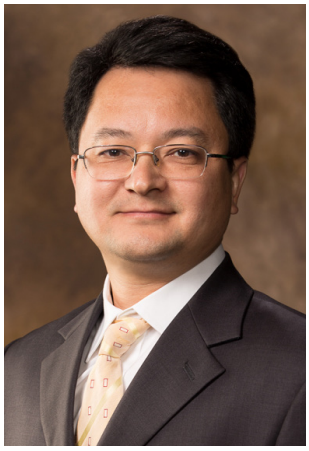
United States Air Force
Windstream Communications DHL
Rockline Industries Harrison Energy Partners
University of Arkansas FedEx Boeing Dell Koch Industries
ABF Freight Dassault Falcon Texas Instruments John Deere
Lockheed Martin Amazon ABF Phillips 66 Accenture
Epic NALCO Marshalltown J.B. Hunt American Tubing
Georgia Pacific SPP Pumps Viridian Nestlé Purina Petcare
LaCroix Optics Butterball Tata Consultancy Services
Univlever Arkansas Electric Cooperative Walmart
Applied Predictive Technologies Green Mountain Technology
QPS Engineering Northrup Grumman Sam's Club
Cerner United States Postal Service Emerson
Tesla Motors Somerset Logistics St. Jude Medical
Booz Allen Hamilton Clark Construction Group
Texas Instruments Walt Disney World

Featured Research

Research Frontiers in Reliability Engineering and Service Logistics

Haitao Liao

The advances and increasing complexities of new technologies require fundamental methodologies to minimize adverse economic and operational impacts of unexpected failures of engineering systems. For instance, it is often expected that a product, as small as a cutting tool used in machining or as massive as a 10 megawatt wind turbine, can operate reliably and be maintained in a timely fashion. However, product reliability and service logistics usually do not reconcile due to various uncertainties. Unfortunately, methodologies that reduce various uncertainties in product reliability and service logistics have been developed in segments. As a result, decisions on maintenance and procurement of service parts are made either too late or too early. In Liao's 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. The questions that must be answered are (1) how to reduce the uncertainty in product reliability estimation prior to and during operation, (2) how to control product reliability in real time in complex engineering settings, and (3) how to determine the maintenance strategy and refine the associated service logistic process by incorporating the product reliability being controlled. Liao's research group has been investigating the answers to these questions through both experimental and analytical studies.



In RISE, to estimate and improve product reliability, different types of reliability tests at material and component levels can be conducted. The applications include nanomaterials, microelectronics, machine tools, and gearboxes. The newly established lab space at the University of Arkansas Engineering Research Center houses a combined environmental testing facility that provides product designers with a full spectrum of analysis on the potential failure modes as well as lifetime and/or degradation data. The team is currently developing 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 implementation of testing strategies and data analysis more attractive. Indeed, by precisely knowing the reliability of a product under different and time-varying operating conditions and prognostics - condition-based maintenance and proactive service logistics can be carried out more effectively than ever before.

Materials & Components

- ✓ Accelerate life test
- ✓ Accelerated degradation test
- ✓ Reliability growth test
- ✓ Reliability demonstration test
- ✓ Reliability prediction
- ✓ Optimal design of test plans

Systems & Products

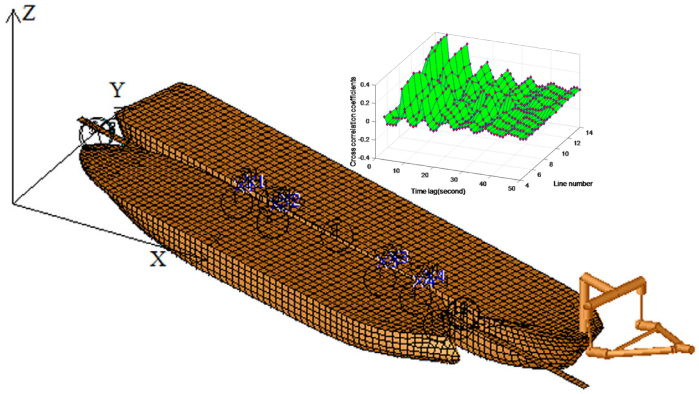
- ✓ HALT/HASS
- ✓ Sys. reliability optimization
- ✓ Diagnostics & prognostics
- ✓ Condition-based maintenance
- ✓ Smart life extension

Fleet

- ✓ Service demand pred.
- ✓ Warranty planning
- ✓ Spare part control
- ✓ Gross profit estimation

In addition to developing mathematical models and statistical tools for solving prognostics and service part inventory control problems, the team is currently focusing more on the reliability and resilience of condition monitoring (CM) systems with multiple sensors. Such systems have been widely implemented to ensure the reliability and safety of engineering systems, such as nuclear power plants, bridges, and offshore oil offloading systems. However, an ironic issue commonly faced by engineers is that the sensors in such CM systems are often less reliable than the systems to be monitored. Moreover, harmful disturbances, such as cyber and/or natural attacks, can also cause sensor failures. Upon the loss of sensor signal(s), a technical challenge is to determine whether or not it is due to sensor failures or to the failure of the systems being monitored. In the case of sensor failure, one way to enhance the dependability of a CM system is to enable its resilience capability, and quickly recover from single or multiple sensor failures. To this end, the spatio-temporal relationships among multiple sensors need to be investigated, and the most effective recovery strategy must be identified in hopes of achieving nearly uninterrupted operation. The team has been working on different signal processing methods, such as wavelet decomposition, and machine learning approaches to identify sensor failures and enable signal prediction based on the available data from multiple sensor signals. The goal is to provide an effective method that balances the response time and the accuracy and precision of signal recovery. The methodology has been tested on a case study on hawser CM in a Floating Production, Storage and Offloading (FPSO) system.

Reliability & Intelligent Systems Engineering (RISE) Laboratory and Combined Environmental Testing Facility of the Industrial Engineering Department



Finite Element Model of a Floating Production, Storage and Offloading System and the Spatio-temporal Correlations between the Forces on Different Hawsers

Dr. Haitao Liao is a Professor and Hefley Endowed Chair in Logistics and Entrepreneurship in the Department of Industrial Engineering at University of Arkansas. He received a Ph.D. degree in Industrial and Systems Engineering from Rutgers University in 2004. His research has been sponsored by the National Science Foundation, Department of Energy, Nuclear Regulatory Commission, Oak Ridge National Laboratory, and industry. In 2014, he served as Chair of INFORMS Quality, Statistics and Reliability (QSR) Section, and President of IIE Quality Control and Reliability Engineering (QCRE) Division. He currently serves as Associate Editor for the *Journal of Quality Technology* and *IISE Transactions on Quality and Reliability Engineering*.

J.B. Hunt Innovation Center of Excellence

Chase E. Rainwater

The J.B. Hunt Innovation Center of Excellence was established in May 2017. This exciting opportunity was made possible through discussions between J.B. Hunt leadership and numerous University of Arkansas administrators. Key amongst these administrators were College of Engineering Dean, John English; Associate Dean for Research, Heather Nachtmann; and Walton College of Business Dean, Matt Waller. The industry-funded research center is a collaboration between the College of Engineering, the Sam M. Walton College of Business (WCOB) and J.B. Hunt professionals. The faculty of the Department of Industrial Engineering (INEG) and the Department of Computer Science and Computer Engineering (CSCE) will be the main contributors from the College of Engineering. Dr. Chase Rainwater, Associate Professor of Industrial Engineering, serves as center director and Dr. Brent Williams, Sam M. Walton College of Business Associate Dean of Executive Education serves as center co-director. The center is funded through a 5-year, $2.75 million grant provided by J.B. Hunt. Center operations are overseen by a steering committee comprised of leadership from both participating colleges, as well as executives from J.B. Hunt. The center is physically located on the 4th floor of Bell Engineering Center on the University of Arkansas campus. The new collaborative space serves as an interdisciplinary work area for students, faculty and J.B. Hunt professionals.

The mission of the center is to develop innovative solutions to address emerging challenges and opportunities facing J.B. Hunt and the transportation logistics industry. The University of Arkansas faculty-led research teams are tasked with overcoming these challenges with technology, advanced decision-making tools and sound business strategy. The center measures successful research projects by their financial impact to J.B. Hunt and the degree in which they disrupt the transportation logistics industry. On June 1, 2017, the center launched its inaugural project which focuses on artificial intelligence solutions in the transportation domain. The project is led by CSCE Department Chair, Dr. Frank Liu, with support from CSCE Assistant Professor, Dr. Michael Gashler. In addition, INEG Assistant Professor, Dr. Xiao Liu, completes the interdisciplinary team with his expertise in statistics and delivering industry-driven technology solutions.

The center plans to launch two additional projects in Fall 2017. Approved results from each of these projects will be presented at an innovation showcase in Spring 2018. This showcase is intended to attract professionals, academics, and students from the logistics field.

J.B. Hunt employees and University of Arkansas administrators celebrate the announcement of the J.B. Hunt Innovation Center of Excellence by calling the Hogs in the J.B. Hunt Corporate auditorium.

Can Home Telehealth Help to Combat Rising Health Care Costs?

Ashlea Bennett Milburn

We all know healthcare is expensive in the United States, but, did you know that more than 75% of all U.S. healthcare spending can be attributed to chronic disease? About half of all American adults have at least one chronic health condition. Telehealth technology has the potential to improve health outcomes for these patients while simultaneously reducing healthcare costs.

Telehealth systems include physiologic monitoring tools such as scales, thermometers, blood glucose monitors, and blood pressure cuffs. Patients collect vital signs in their homes and remotely transmit them for review by healthcare professionals. Home healthcare agencies using telehealth can detect patient health deteriorations and perform early interventions to avoid unnecessary emergency department, hospital, and physician visits and associated costs.

In *"A Study of Home Telehealth Diffusion Among US Home Healthcare Agencies Using System Dynamics,"* Assistant Professor Ashlea Bennett Milburn and her former Ph.D. student, Mehmet Serdar Kilinc, use system dynamics to understand how telehealth use has spread among U.S. home healthcare agencies over time. Factors such as the complexity of the technology and the reimbursement environment are used to project the proportion of agencies that will adopt telehealth over a ten-year horizon. Then variables such as patient demand and telehealth supply and cost are included to estimate the impact of home telehealth adoption on the long-term utilization of acute healthcare services.

A computational study indicates significant cost savings in even the most conservative test instances studied. For example, when the capacity of telehealth is limited and the potential for telehealth use to improve health outcomes is assumed to be minimal, annual savings of $8 billion in 2020 and $10 billion in 2025 are expected. This translates to annual savings of approximately $4,000 per telehealth patient.

A widespread adoption of home telehealth holds great potential for the U.S. healthcare system; however, the home healthcare industry has been slow to adopt due to a number of barriers such as limited Medicare reimbursement of home telehealth. This research can be used by policy makers to inform how home telehealth adoption may change as barriers are removed. Drs. Milburn and Kilinc received a 2017 Best Paper Award from the *IISE Transactions on Healthcare Systems Engineering* journal for this work.

Kilinc, M.S. and **Milburn, A.B.** 2016. A study of home telehealth diffusion among US home healthcare agencies using system dynamics. *IIE Transactions on Healthcare Systems Engineering* 6(3), p. 140-161.

Grants

As it relates to scholarly activity, the department productivity included submission of 40 proposals and 21 external grant awards with a cumulative total of more than $3M. Total research expenditures exceeded $2.2M. During 2016-2017, the following research grants were active.

Project PIs are indicated in **bold** face type.

Chaovalitwongse, W. Art, National Science Foundation, $45,205, "Network Optimization of Functional Connectivity in Neuroimaging for Differential Diagnoses of Brain Diseases," 2017

Chaovalitwongse, W. Art, National Science Foundation, $112,375, "Decision Model for Patient-Specific Motion Management in Radiation Therapy Planning," 2017-2018

Chaovalitwongse, W. Art, Translational Research Institute via University of Arkansas for Medical Sciences, $18,870, "Development, Validation, and Implementation of an Opioid Risk Prediction," 2017-2018

Chaovalitwongse, W. Art, National Science Foundation, $150,000, "Relationship of Cortical Field Anatomy to Network Vulnerability and Behavior," 2017-2021

Gattis, Jim, and **Justin Chimka**, Arkansas State Police, $313,338, "Seat Belt, Motorcycle Helmet, & Child Restraint Survey," 2011-2018

Chimka, Justin, United Sates Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $63,235, "Climate impacts on lock use and performance," 2016-2017

Chimka, Justin, Bekaert Corporation, $33,070, "Maintenance Time Studies," 2017

Geunes, Joseph, United States Department of Defense, Pine Bluff Arsenal, $7,710, "Baselining Visit for Best Practices Recommendations," 2017

Geunes, Joseph, United States Department of Defense, Pine Bluff Arsenal, $87,376, "PBA Material Management Best Practices Analysis and Expansion Planning," 2017-2018

Liao, Haitao, National Science Foundation, $176,860, "Automated Knowledge Discovery in Reliability and Healthcare from Complex Data with Covariates," 2016-2019

Milburn, Ashlea, National Science Foundation, $500,000, "CAREER: Information Accuracy and the Use of Social Data in Planning for Disaster Response," 2016-2021

Milburn, Ashlea, Arkansas Department of Higher Education, $3,325, "SURF" Award, Anna Hudgeons,

Hall, Kevin, and **Heather Nachtmann**, United States Department of Transportation, $325,983, "Region 6 UTC—with OkTC," 2013-2018

Nachtmann, Heather, United States Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $729,114, "MarTREC administration," 2013-2018

Nachtmann, Heather, and Justin Chimka, United States Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $212,944, "Supporting Secure & Resilient Inland Waterways," 2014-2017

Needy, Kim, Ken Walsh and Thais Alves (San Diego State University), Construction Industry Institute, $314,764 total of which, $87,942 is the Arkansas portion, "Achieving Zero Rework through Effective Supplier Quality Practices," 2012-2017

Needy, Kim, and Robert Ries (University of Florida), Construction Industry Institute, $603,988 total of which $176,820 is the Arkansas portion, "Creating Standards for Industry-wide Quality Metrics," 2013-2017

Nurre, Sarah, United States Department of Transportation, $34,585, "The Dependence of Infrastructure Restoration on Transportation Networks," 2016-2017

Parnell, Gregory, and Ed Pohl, National Science Foundation, ERDC, $139,613, "Quantifying Resilience to Enable Engineered Resilient Systems," 2016-2017

Pierson, Harry, National Science Foundation, Red River Army Depot, $60,000, "Collaborative Robotics," 2016-2018

Pohl, Edward, Kelly Sullivan, and Haitao Liao, Department of Defense Science of Test, $159,243, "Resource Constrained Accelerated Reliability Growth Testing for Systems of Systems," 2016-2017

Rainwater, Chase, and Heather Nachtmann, United States Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $61,529, "Optimal Dredge Fleet Scheduling - Phase 2 Research," 2016-2017

Rainwater, Chase, and Harry Pierson, Walmart, $4,941, "Mobile Robotics in Retail –iSparky: Proof of Concept Phase," 2015-2016

Rainwater, Chase, Material Handling Institute of America, $12,500, "Shared Mixing and Consolidating Centers," 2016-2017

Cothren, Jackson David, and **Chase Rainwater**, $434,769, "Autonomous and Rigorous Photogrammetric Localization," 2016-2017

Rainwater, Chase, Walmart Foundation, $202,495, "Poultry Excellence in China: Improving Food Safety in Poultry Supply Chain," 2016-2018

Rainwater, Chase, Toyota Material Handling, $59,850, "The Impact of Emerging Logistics Paradigms on Material Handling System Functional Requirements," 2017

Rainwater, Chase, and Brent Williams, J.B Hunt Transportation Inc., $2,750,000, "J.B. Hunt Center of Excellence," 2017-2022

Rossetti, Manuel, National Science Foundation, $189,800, "I/UCRC for Excellence in Logistic & Distribution, Phase III," 2012-2017

Rossetti, Manuel, National Science Foundation, I/UCRC Defense Logistics Agency, $60,000, "Develop Logistics and Simulation Based Tools to Support Operational Planning of the Bulk Petroleum Supply Chains," 2015-2017

Rossetti, Manuel, and Shengfan Zhang, Medtronic, $60,000, "Multi-Stop and Load Building Optimization Models," 2016-2017

Rossetti, Manuel, Medtronic, $60,000, "Modeling the Benefits of Global Standards within Healthcare Organizations," 2016-2017

Rossetti, Manuel, Medtronic, $60,000, "Supply Chain Analysis with Healthcare Manufacturing and Distribution Net," 2017-2018

Rossetti, Manuel, National Science Foundation, $8,000, "Research Experience for Undergraduates," 2015-2017

Rossetti, Manuel, Kim Needy, Carol Gattis, and Ed Clausen, National Science Foundation, $597,316, "Student Integrated Intern Research Experience (SIIRE) a Pathway to Graduate Studies," 2012-2017

Sullivan, Kelly, United States Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $154,383, "Efficient Dredging Strategies for Improving Transportation Infrastructure," 2014-2016

Zhang, Shengfan, and Heather Nachtmann, United States Department of Transportation, Tier 1 Maritime Transportation Research and Education Center, $221,745, "Dynamic Decision Modeling for Inland Waterway Disruptions," 2014-2016

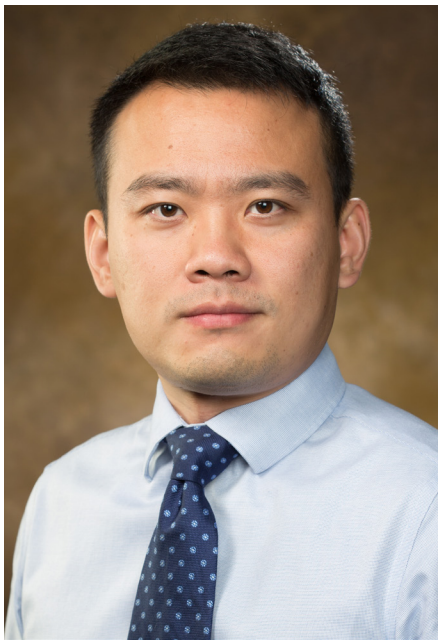
Zhang, Shengfan, Arkansas Department of Higher Education, $4,000, "SURF Award," 2017

Zhang, Shengfan, and Chase Rainwater, CELDi CDP, $46,115, "Development of Logistics Risk Assessment Tool," 2015-2016

Zhang, Shengfan, National Science Foundation, $20,000, "Research Experience for Teachers," 2016-2018

Zhang, Shengfan and W. Art Chaovalitwongse, Arkansas Biosciences Institute, $16,210, "An Integrated Decision Analytics Framework for Lung Volume Reduction Surgery Treatment of Emphysema," 2017-2018

New Faculty



Xiao Liu is joining the Industrial Engineering Department from IBM Thomas J. Watson Research Center in Yorktown Heights, New York. He received his doctoral degree from the Department of Industrial and Systems Engineering, National University of Singapore (NUS).

Liu's research focuses on engineering probability and statistics, spatio-temporal modeling, big data analytics, and various engineering-knowledge-based data-driven methodologies in broad areas such as quality and reliability, manufacturing yield prediction, preventive maintenance, urban air quality modeling, and extreme weather events prediction.

He has published in peer-reviewed journals including *Technometrics*, *The Annals of Applied Statistics*, *IIE Transactions*, *IEEE Transactions on Reliability*, and the *Journal of Quality Technology*.

Liu has received awards including the prestigious Ralph A. Evans/P.K. McElroy Award for the best paper at the 2011 Reliability and Maintainability Symposium, the IBM Outstanding Technical Achievement Award in both 2015 and 2017, and the best paper award from the QSR (Quality, Statistics and Reliability) session at INFORMS 2016.

He is on the editorial board of *Quality and Reliability Engineering International*, and served as an Adjunct Assistant Professor at the Department of Industrial and Systems Engineering, National University of Singapore from 2013 to 2016.

Achievements and Service

Haitao Liao, was recently named the recipient of a National Science Foundation Award. The award will fund developing new methodologies for automated knowledge discovery from complex reliability and healthcare data with covariates.

Edward A. Pohl, professor and department head, was selected as a fellow for the 2016-17 SEC Academic Leadership Development Program.

Assistant professor Ashlea Bennett Milburn has been named the 2017-2018 recipient of the John L. Imhoff Chair in Industrial Engineering. Ashlea and recent doctoral alum, Mehmet Sedar Kilinc, received the IISE Transactions on Healthcare Systems Engineering Award for their paper *"A Study of Home Telehealth Diffusion among US Home Healthcare Agencies using System Dynamics."*

Heather Nachtmann, professor and Associate Dean for Research, received a Tier 1 UTC grant for MarTREC under FAST Act.

Harry Pierson, has been appointed as a fellow in the 2017 Air Force Research Lab Summer Faculty Fellowship Program at AFRL-Materials and Manufacturing.

Gregory S. Parnell, has just published his third book, *Trade-off Analytics: Creating and Exploring the System Tradespace.*

Letitia M. Pohl, was Inducted into the University of Arkansas Teaching Academy as Fellow. A finalist for the Imhoff Award given by the Teaching Academy, Pohl advises all undergraduate industrial engineering students, teaches five courses throughout the academic year, and serves as the Accreditation Board for Engineering and Technology (ABET) coordinator for the Department of Industrial Engineering.

In spring 2017 the College of Engineering recognized C. Richard Cassady with the Dean's Award for Public Service.

The John Imhoff Award for Teaching was presented to John White, professor and chancellor emeritus by the College of Engineering in spring 2017.

The Arkansas Academy of Industrial Engineering selected associate professor Chase Rainwater as Faculty Member of the Year.

They also recognized two staff members with awards. Selected as Administrative Staff Member of the Year was Associate Director of the Master of Science in Operations Management program, Richard Ham and Tamara Ellenbecker was selected as Support Staff Member of the Year.

Faculty Service

C. Richard Cassady

- Associate Editor of the *Journal of Risk and Reliability* 2008-2016.

W. Art Chaovalitwongse

- Area Editor of the *Annals of Operations Research* 2002-present;
- Associate Editor of *Brain Informatics* 2014-present;
- Associate Editor of *IEEE Transactions on Human-Machine Systems* 2013-present;
- Associate Editor of *IIE Transactions on Healthcare Systems Engineering* 2014-present;
- Associate Editor of the *Journal of Combinatorial Optimization* 2005-present;
- Associate Editor of the *Journal of Global Optimization* 2010-present;
- Associate Editor of *Optimization Letters* 2006-present;
- Editorial Board Member for the *Journal of Radiology & Radiation Therapy* 2013-present;
- Editorial Board Member for the *Journal of Supply Chain and Operations Management* 2013-present;
- Editorial Board Member for the *Suranaree Journal of Social Science* 2014-present;
- President-Elect of the Omega Rho International Honor Society, the Honor Society of INFORMS, 2016-2018;
- Secretary of the Omega Rho International Honor Society, the Honor Society of INFORMS, 2013-2016.

Justin R. Chimka

- Associate Editor of *Economic Quality Control* 2014-2016;
- Editorial Board Member of the *International Journal of Quality Engineering & Technology* 2014-2016;
- Editor *International Journal of Six sigma & Competitive Advantage* 2014-2016.

Joseph Geunes

- Chair of the Editor in Chief Search Committee for the TutORials Series of INFORMS 2016-present.

Haitao Liao

- Associate Editor *IEEE Transactions on Reliability* 2016;
- Associate Editor of the *Journal of Quality Technology* 2016-Present;
- Special Issue Co-Editor *Journal of Quality Technology – Big Data Applications in Reliability* 2016-present

Ashlea Bennett Milburn

- Treasurer, Health Systems Engineering Alliance, 2014-2016

Heather Nachtmann

- President, American Society for Engineering Management, 2016-17;
- Advisory Council for Transportation Research Member appointed by Arkansas State Highway and Transportation Department, 2009-Present;
- Associate Editor of the *Engineering Management Journal* 2012-present;
- Associate Editor of *The Engineering Economist* 2004-present;
- Engineering Research Council Member of the American Society for Engineering Education, 2009-2016;
- National Engineering Economy Teaching Excellence Award Committee Member of the American Society for Engineering Education, 2009-2016;
- Scholarship Fund Trustee for the Institute of Industrial and Systems Engineers, (Chair) 2014-2016.

Kim LaScola Needy

- Board of Directors for the Engineering Management Division of the American Society for Engineering Education, 2015-2017;
- Past-President of the Council of Engineering Management Academic Leaders (CEMAL) for the American Society for Engineering Management, 2016-2017;
- President/Treasurer of the American Society for Engineering Management, 2015-2016;
- Governing Board of the Body of Knowledge for the Institute of Industrial and Systems Engineers, 2016-2018.

Sarah Nurre

- President-Elect of the Women in Operations Research and Management Science, 2016.

Gregory S. Parnell

- Editorial Board of the *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;
- Editorial Board – Advisory Editor for *Decision and Risk Analysis*, Wiley Series in Operations Research and Management Science, 2012-present;
- Editorial Board for the *Decision Analysis Journal*, 2009-present.

Edward A. Pohl

- Board Member, IIE Society of Engineering Management, 2014-2016;
- President of the Society of Reliability Engineers, 2016-2018;
- Regional Director of the American Society for Engineering Management, 2014-2017;
- Board of Directors, Reliability & Maintainability Symposium, 2014-present;
- Associate Editor of *IEEE Transactions on Reliability* 2014-present;
- Associate Editor of the *Journal of Risk and Reliability* 2005-present;
- Associate Editor of *The Journal of Military Operations Research* 2002-present;
- Associate Editor of *Quality Technology & Quantitative Management* 2012-present;
- INFORMS Selects Committee, INFORMS Analytics Conference, 2014-present;
- COMAP Subcommittee, INFORMS Consortium for Mathematics and Its Applications, 2012-2016.

Letitia M. Pohl

- Division Chair for the American Society of Engineering Education (ASEE), Industrial Engineering Division, 2016-2017;
- COMAP Subcommittee, Institute for Operations Research and Management Science (INFORMS), Education Committee 2016-2017.

Chase Rainwater

- OR Division Board of Directors of the Institute of Industrial Engineers 2015-present.

Manuel D. Rossetti

- Editorial Advisory Board for the *Journal of Defense Analytics and Logistics* 2016;
- Associate Editor for the *International Journal of Modeling and Simulation* 2016.

Kelly Sullivan

- Associate Editor of *Operations Research Letters* (journal), 2016-present.

John A. White

- Editorial Board for *The Engineering Economist*, 2014-2017;
- Member, ASEE National Engineering Economy Teaching Excellence Award Committee, 2015-2015.

Shengfan Zhang

- Jr. Vice President of Programs, INFORMS – Section on Public Sector OR, Elected December 2016.

Publications

In 2016 the faculty of the Department of Industrial Engineering at the University of Arkansas contributed one book, 35 refereed journal articles, 20 refereed conference proceeding and other refereed publications. The faculty authors are indicated in bold.

Book Chapters

Parnell, G., "Chapter 8. Decision Analysis," *The Engineering Management Handbook*, 2nd Ed, Marino, D. N. & Farr, J. V., Editors, American Society of Engineering Management, 2016, pp. 151-168

Refereed Journal Articles

Xiao, C., S. Wang, J. Bledsoe, S. Mehta, M. Semrud-Clikeman, T.G. Grabowski, and **W. Chaovalitwongse**, "An Integrated Feature Ranking and Selection Framework for ADHD Diagnosis." *Brain Informatics*, Vol. 3, No. 3 (2016): 145-155

Xiao, C., S. Wang, L. Zheng, X. Zhang, and **W. Chaovalitwongse**, "A Patient-Specific Model for Predicting Tibia Soft Tissue Insertions from Bony Outlines Using a Spatial Structure Supervised Learning Framework." *IEEE Transactions on Human Machine Systems* (IF = 1.982), Vol. 46, No. 5 (2016): 638-646

Ma, X., C.-A. Chou, H. Sayama, and **W. Art Chaovalitwongse**, "Brain Response Pattern Identification Using a Particle Swarm Optimization Based Approach." *Brain Informatics*, Vol. 3, No. 3 (2016): 181-192

Wang, S., J. Gwizdka, and **W. Chaovalitwongse**, "Using Wireless EEG Signals to Assess Memory Workload in the N-Back Task." *IEEE Transactions on Human Machine Systems* (IF = 1.982), Vol. 46, No. 3 (2016): 424-435

Xiao, C. and **W. Chaovalitwongse**, "Optimization Models for Feature Selection of Decomposed Nearest Neighbor." *IEEE Transactions on Systems, Man, and Cybernetics – Systems* (IF = 2.169), Vol. 14, No. 2 (2016): 177-184

Ahangar, Negin Enayaty and **J. R. Chimka**, "Attribute control charts with optimal limits." *Quality & Reliability Engineering International*, Vol. 32, No. 4 (2016): 1381-1391

Chimka, J. R. and T. Talafuse, "Poisson regression analysis of additional strokes assessed at golf." *International Journal of Sports Science & Coaching*, Vol. 11, No. 4 (2016): 619-622

Needham, Erin, S. Sidney, **J.R. Chimka**, and J. Fairey, "THM, DHAN, and TONO precursor absorption by carbon nanotubes." *Environmental Science: Water Research & Technology*, Issue 6 (2016): 1004-1013

Geunes, J., H.E. Romeijn, W. van den Heuvel, "Improving the Efficiency of Decentralized Supply Chains with Fixed Ordering Costs." *European Journal of Operational Research*, Vol. 252, No. 3 (2016): 815-828

Konur, D., **J. Geunes**, "Supplier Wholesale Pricing for A Retail Chain: Implications of Centralized vs. Decentralized Retailing and Procurement under Quantity Competition." *Omega*, Vol. 65, No. 13 (2016): 98-110

Teksan, Z.M., **J. Geunes**, "An EOQ Model with Price-Dependent Supply and Demand." *International Journal of Production Economics*, Vol. 178 (2016): 22-33

Teksan, Z.M., **J. Geunes**, "Production Planning with Price-Dependent Supply Capacity." *IIE Transactions*, Vol. 48, No. 10 (2016): 938-954

Chen, T., S. Zheng, **H.T. Liao**, and J. Feng, "A Multi-attribute Reliability Allocation Method Considering Uncertain Preferences." *Quality and Reliability Engineering International*, Vol. 32, No. 7 (2016): 2233-2244

Xu, Y. and **H.T. Liao**, "Reliability Analysis and Redundancy Allocation for a One-Shot System Containing Multifunctional Components." *IEEE Transactions on Reliability*, Vol. 65, No. 2 (2016): 1045-1057

Zhang, D. and **H.T. Liao**, "A Fully Integrated Double-Loop Approach to the Design of Statistically and Energy Efficient Accelerated Life Tests." *IIE Transactions*, Vol. 48, No. 4 (2016): 317-388

Pascual, R., G. Santelices, and **H.T. Liao**, "Channel Coordination on Fixed Term Maintenance Outsourcing Contracts." *IIE Transactions*, Vol. 48, No. 7 (2016): 651-660

Li, R., **H.T. Liao**, X. Liu, and N. Huang, "Lifetime Optimization for Linear Wireless Sensor Networks under Retransmission." *International Journal of Ad Hoc and Ubiquitous Computing*, Vol. 22, No. 3 (2016): 153-163

Hamidi, M., **H.T. Liao** and F. Szidarovszky, "Non-cooperative and Cooperative Game-Theoretic Models for Usage-based Lease Contracts." *European Journal of Operational Research*, Vol. 255, Issue 1 (2016): 163-174

Li, X., R. Luo, W. Zhang, and **H.T. Liao**, "A New Method for Measuring Thermal Contact Resistance of Graphite." *Thin Film Material Measurement*, Vol. 93 (2016) 202-207

Sun, F., L. Liu, X. Li, and **H.T. Liao**, "Stochastic Modeling and Analysis of Multiple Nonlinear Accelerated Degradation Processes through Information Fusion." *Sensors*, Vol. 16, No. 8 (2016): 1242

Sun, F., L. Liu, X. Li, and **H.T. Liao**, "Reliability Analysis with Multiple Dependent Features from a Vibration-based Accelerated Degradation Test." *Shock and Vibration*, Vol. 2016, ID 2315916 (2016)

Kilinc, M.S. and **A.B. Milburn**, "A study of home telehealth diffusion among US home healthcare agencies using system dynamics." *IIE Transactions on Healthcare Systems Engineering*, Vol. 6, No. 3 (2016): 140-161

Lian, K., **A.B. Milburn**, and R. Rardin, "An improved multi-directional local search algorithm for the multi-objective consistent vehicle routing problem." *IIE Transactions*, Vol. 40, No. 10 (2016): 975-992

Furkan Oztanriseven and **Heather Nachtmann**, "Economic Impact Analysis of Inland Waterway Disruption Response." *The Engineering Economist*, (2016): doi: 10.1080/0013791X.2016.1163627

Tong, Jingjing and **Heather Nachtmann**, "Cargo Prioritization and Terminal Allocation Problem for Inland Waterway Disruptions." *Maritime Economics & Logistics*, (2016): doi:10.1057/mel.2015.34

Scala, N. M., J. Rajgopal, L.G. Vargas, and **K. L. Needy**, "Group decision making with dispersion in the analytic hierarchy process." *Group Decision and Negotiation*, Vol. 25, No. 2 (2016): 355-372

AlMaian, R. Y., **K. L. Needy**, K. D. Walsh, and T.C.L. Alves, "A qualitative data analysis for supplier quality-management practices for engineer-procure-construct projects." *Journal of Construction Engineering & Management*, Vol. 142, No. 2 (2016) online

AlMaian, R. Y., **K. L. Needy**, T.C.L. Alves, and K. D. Walsh, "Analyzing effective supplier quality management practices using simple multi-attribute rating technique and value focused thinking." *Journal of Management in Engineering*, Vol. 32, No. 1 (2016): online

Sharkey, T.C., **S.G. Nurre**, H. Nguyen, J.H. Chow, J.E. Mitchell, and W.A. Wallace, "Identification and Classification of Restoration Interdependencies in the Wake of Hurricane Sandy." *Journal of Infrastructure Systems*, Vol. 22, No. 1 (2016): 04015007 online

Sharkey, T.C. and **S.G. Nurre**, "Video Tutorials within an Undergraduate Operations Research Course: Student Perception on Their Integration and Creating a Blended Learning Environment." *INFORMS Transactions on Education*, Vol. 17, No. 1 (2016): 1-12

Talafuse, T. and **E. Pohl**, "A Bat Algorithm (BA) for the Redundancy Allocation Problem (RAP)." *Engineering Optimization*, Vol. 48, No. 5 (2016) 900-910

Medal,H., **E. Pohl**, and M.D. Rossetti, "Allocating Protection Resources to facilities when the Effect of Protection is Uncertain." *IIE Transactions*, Vol. 48, No. 3 (2016): 220-234

Gedik, R., **C. Rainwater**, H. Nachtmann, E. Pohl, and N. Mitchell, "Analysis of a parallel machine scheduling problem with sequence dependent setup times and job availability intervals." *European Journal of Operational Research*, Vol. 251, No. 2 (2016): 640-650

Al-Rifai´ M. H., **M.D. Rossetti**, A. Zadeh, "A Heuristic Optimization Algorithm for Two-Echelon (R, Q) Inventory Systems with Non-Identical Retailers." *International Journal for Inventory Research*, Vol. 3, No. 2 (2016): 166-193

Gedik, R., **S. Zhang** and C. Rainwater, "Strategic level proton therapy patient admission planning: a Markov decision process modeling approach." *Healthcare Management Science*, (2016): DOI 10.1007/s10729-016-9354-6

Refereed Conference Proceedings and Other Refereed Publications

Wang, S., K.M. Kam, C. Xiao, and **W. Art Chaovalitwongse**, "An Efficient Orthogonal Polynomial-Based Time Series Subsequence Pattern Searching Approach with an Application to Respiratory Motion," Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16), Phoenix, Arizona, February 2016.

Wootton, L., **W. Art Chaovalitwongse**, N. Li, M. Nyflot, and E. Ford, "Improving the Performance of Gamma Analysis QA with Radiomics-Based Image Analysis," Proceedings of the Fifty- Eighth Annual Meeting of the American Association of Physicists in Medicine (AAPM), Washington, DC, July 2016.

Macomber, M.W., A. Samareh, **W. Art Chaovalitwongse**, S.R. Bowen, S.A. Patel, J. Zeng, M. Nyflot, "Prediction of Pathologic Complete Response to Neoadjuvant Chemoradiation in the Treatment of Esophageal Cancer Using Machine Learning," Proceedings of the 2016 Annual Meeting- American Society for Radiation Oncology (ASTRO), September 2016, Boston, MA

S. Wang, C. Xiao, J.J. Tsai, **W. Art Chaovalitwongse**, and T.J. Grabowski, "A Novel Mutual-Information-Guided Sparse Feature Selection Approach for Epilepsy Diagnosis Using Interictal EEG Signals," Proceedings of the 2016 International Conference on Brain Informatics & Health, Omaha, Nebraska, October 2016.

Spraker, M.B., L. Wootton, **W. Art Chaovalitwongse**, M.W. Macomber, S.M. Pollack, E.Y. Kim, and M. Nyflot, "Radiomic Features Extracted from T1-Weighted Magnetic Resonance Images Predict Outcomes in Soft Tissue Sarcoma," Lisbon, Portugal, November 2016.

Al-Sarray, M., H. Mhiesan, R. McCann and **H.T. Liao**, "Developing Risk-Based Reliability Method for N-1-1 Contingency Events Assessment," Institute of Electrical and Electronics Engineers Power & Energy Society (IEEE PES) General Meeting, Boston, Massachusetts, July 2016.

Li, B., **A.B. Milburn**, M. Rossetti, "Methods for analyzing fiscal calendar effects within an ERP system," Industrial and Systems Engineering Research Conference, Anaheim, California, May 2016.

Alves, T., **K.L. Needy**, K.D. Walsh and D. Chan, "Understanding inspection challenges in the EPC industry: A simulation approach," 24th Annual Conference of the International Group for Lean Construction, Boston, Massachusetts, July 2016.

Callahan, J., M. Besterfield-Sacre, J. Carpenter, **K.L. Needy**, C. Schrader, "Listening and Negotiating," American Society for Engineering Education Annual Conference Proceedings. New Orleans, Louisiana, June 2016.

Alves, T., K. Ravaghi and **K. L. Needy**, "Supplier selection in EPC projects: An overview of the process and its main activities," American Society of Civil Engineers Construction Research Congress. San Juan, Puerto Rico, May 31–June 2, 2016.

Small, C., **G. Parnell** and E. Pohl, "Resilient Systems Evaluation Model," Proceedings of the Industrial and Systems Engineering Research Conference, Anaheim, California, May, 2016.

MacCalman, A. and **G. Parnell**, "Multi-objective Decision Analysis with Probability Management for Systems Engineering Trade-off Analysis," Hawaii International Conference on System Sciences, HICSS-49, Kauai, Hawaii, January 5-8, 2016.

Lynch-Caris, Terri and **Letitia M. Pohl**, "Ergonomics Topics for the Undergraduate Classroom," American Society for Engineering Education, New Orleans, Louisiana, June 2016.

Parsa, P., M. Shbool, **M.D. Rossetti**, S. Zhang, E. Pohl, "A Multi-Objective Decision Analysis for Supply Chain Collaboration Programs," Proceedings of 2016 Annual Meeting of the Decision Sciences Institute, Austin, Texas, November 19-22, 2016.

Janer, M. L. and **M.D. Rossetti**, "Simulation Modeling of Alternatives to Avoid Interruptions of the X-Ray Screening Operation at Security Checkpoints," Proceedings of the 2016 Winter Simulation Conference, Washington D.C., December 11-14, 2016.

Sheikh Zadeh, A. and **M.D. Rossetti**, "Inventory Segmentation Performance Improvement for Multi-Echelon Repairable Items Logistics Systems," Proceedings of the 2016 Industrial and Systems Engineering Research Conference (ISERC), Anaheim, California, May 2016.

Pham, A. and **S. Zhang**, "Estimation of Natural History, Parameters for Low-Grade Glioma Patients," Industrial and Systems Engineering Research Conference, Anaheim, California, May 2016.

Madadi, M., R. Holmer, **S. Zhang**, H. Nachtmann, "Dynamic Decision Modeling for Inland Waterway Disruptions," Industrial and Systems Engineering Research Conference, Anaheim, California, May 2016.

Lee, H., **S. Zhang**, J.A. White, "The Dynamic Block Stacking Problem with Random Demand," Industrial and Systems Engineering Research Conference, Anaheim, California, May 2016.

Parsa, P., M.D. Rossetti, **S. Zhang**, E. Pohl, "A Multi-Objective Decision Analysis for Supply Chain Collaboration Programs," Annual Meeting of the Decision Science Institute, Austin, Texas, November 2016.

Alumni Highlights

The Department benefits from continued support and interaction with our distinguished alumni group, the Arkansas Academy of Industrial Engineering (AAIE), whose leadership sponsors endeavors to aid in student academic success and enhance student preparedness such as the A4U program (Academy Focused on Recruitment, Retention, and Readiness of Undergraduates), the Global Studies Endowment program, and Mock Interview initiative.

The Academy has an active membership of 184 alumni. Inductees are distinguished graduates and are selected for sustained and outstanding contributions to the industrial engineering profession.

College of Engineering Annual Awards

Annually, the College of Engineering recognizes graduates who have provided leadership in their communities and achieved distinction in their fields of endeavor. The 2017 recipients were as follows:

Larry Stephens was inducted into the college's **Hall of Fame**, which was established in 1965 to recognize prominent graduates and leaders who have made outstanding contributions to the engineering profession and to society as a whole.

Stephens received his bachelor's degree in industrial engineering in 1958. He co-founded Mid-South Engineering in 1969. Mid-South is a full-service consulting engineering firm with expertise within the wood products industry. Now retired, Stephens has served as vice president, president, chief operating officer and chairman of the board at Mid-South.

A charter member and first president of the Arkansas Academy of Industrial Engineering, Mr. Stephens is a past member of the University of Arkansas National Development Council, a life member and past national president of the University of Arkansas Alumni Association, and he served on the College of Engineering committee for the Campaign for the Twenty-First Century. He is a member of the Engineering Dean's Advisory Council, National Society of Professional Engineers, the Arkansas Society of Professional Engineers, the Technical Association of Pulp and Paper, and the Institute of Industrial and Systems Engineers.

Stephens is the 2005 recipient of the College of Engineering's Distinguished Alumni Award, and in 2015 he received the Engineer of the Year Award from the Arkansas Society of Professional Engineers and was named Man of the Year by the Hot Springs Chamber of Commerce the same year. He was also selected by the American Society of Plumbing Engineers as the Engineer of the Year.

Mr. Stephens and his wife, Gwen, have been giving to the university for 35 years, the longest consecutive donors. In October 2014, Stephens received the Andrew J. Lucas Alumni Service Award from the Arkansas Alumni Association. He has also served as chairman of the Hot Springs Airport Commission and the Hot Springs Civil Service Commission, as well as serving on several other government committees and commissions. He currently serves on the Board of Directors for Levi Hospital at the Oaklawn Foundation Board.

The industrial engineering recipient of the **Distinguished Alumni Award** was Pam McGinnis. McGinnis received a bachelor's degree in industrial engineering in 1990 and has an accomplished 26 year career with Phillips66. Over her career, she has served in senior leadership positions, including Truck and Rail transportation and International Marine Shipping. As general manager of U.S. Products Supply and Distribution, she successfully expanded into new international markets, and as general manager of Procurement, she was responsible for global materials and services procurement and risk management.

McGinnis is a member of the College of Engineering Advisory Council and serves on the CAPS Research board of directors. She also serves on the executive committee of the Houston Area Habitat for Humanity board of directors.

The **Early Career Award** recognizes exceptional professional and personal achievements of recent College of Engineering graduates. The recipient from industrial engineering was

Amanda Furr. Amanda received her BSIE in 2003. Currently she serves as the youngest female chief engineer in the Department of Veteran's Affairs. In this role she manages maintenance, construction, safety and environmental compliance of the healthcare facilities for the Central Arkansas Veteran's Healthcare System, and has been recognized for her leadership. She completed a master's degree in operations management in May 2017.

Other Awards and Recognitions

- Doctoral Alumna Jen Pazour, Assistant Professor of Industrial and Systems Engineering at Rensselaer Polytechnic Institute (RPI) was the recipient of the Dr. Hamed K. Eldin Outstanding Early Career IE in Academia Award at the Annual IISE Conference & Expo in Pittsburgh, PA. The award, which is presented to only one recipient, recognizes individuals in academia who have demonstrated outstanding characteristics in education, leadership, professionalism, and potential in industrial engineering.

- Bryan Hill; BSIE '03, MSIE '07, assistant dean for student recruitment and diversity, honors and international programs in the College of Engineering, was the staff recipient of the Collis R. Geren University Award.
- The 31st Arkansas Academy of Industrial Engineering Annual Awards and Induction Banquet was held in April 2017. The Academy inducted ten new members: Pam McGinnis, Jana Della Rosa, Ray Asfahl, Chris Wessels, Scott Hambuchen, Malik Sadiq, Stephen Jenkins, Ross Tompkins, Michele Dime, and Dennis Anderson.

Department Celebrates 65th Anniversary

The event held Saturday, September 17th, 2016 brought together alumni, faculty, staff and students of the department in a tailgate themed reception. Many of those attending commented on the changes the department has undergone in the years since its humble beginnings.

The Imhoff Study Center, named for founding department head, John L. Imhoff was fittingly the back drop for the event. Dr. Imhoff is fondly remembered by alumni, faculty and staff alike as a passionate industrial engineer and teacher.

In conjunction with the event, the Arkansas Academy of Industrial Engineering (AAIE) held their annual Mentor Circle Kickoff event. The mentoring circles are sponsored by the Academy's A4U Committee. A4U is an abbreviated form of AAIE focused on the Recruitment, Retention, and Readiness of industrial engineering students at the University of Arkansas. This committee also coordinates an annual comprehensive Mock Interview event for students. Dean of Engineering, John English, welcomed the attendees and congratulated the Department on its many achievements. Dean English is an alumnus of the Department as well as an AAIE member. "It was great to see so many alumni at the event," commented Ed Pohl, head of the department, "I am honored to be a part of the history and success of the department."

A little history of the department...

In 1949 plans were announced to offer the Bachelor of Science degree in Industrial Engineering. At the time, students working on a Bachelor of Arts degree in Industrial Management were given the opportunity to take additional courses to qualify for the new degree. The first students to graduate with the degree graduated in 1950 and 1951.

John L. Imhoff was hired as the first head of the program in 1951. Coming from the industrial engineering option in the mechanical engineering department at the University of Minnesota, he had coordinated the program and was keen to see the program at the University of Arkansas succeed.

With the strong leadership of Imhoff in the 1950s and 1960s, the student chapters of AIIE and Alpha Pi Mu were initiated. The program played a leadership role on the national level of the professional societies. And in 1966 with Imhoff as president of the Alpha Pi Mu society, the national conference was held at the University of Arkansas. It was attended by the acknowledged "Mother of IE," Lillian Gilbreth.

John Imhoff and Lilian Gilbreth

In January 1987, the students, faculty and staff of the College of Engineering began the spring semester in a brand new building: Bell Engineering Center. Bell provided space for four of the college's departments, including Industrial Engineering, as well as plenty of room for teaching and labs.

Today the department has 236 undergraduate students and 52 graduate students (16 master's students and 36 doctoral students). Currently there are 17 tenure/tenure-track faculty members along with four non-tenure track faculty members. Through the years, the outstanding leadership of the Industrial Engineering Department has led to the hiring of strong-performing award-winning faculty, making the department a rising star among its cohorts in academia.

Students Pursue Global Studies

Students majoring in Industrial Engineering who are interested in study abroad experiences are eligible to apply to the John L. Imhoff Global Studies Endowment for scholarships. These scholarships are designed to help defray the expenses for industrial engineering students while engaged in for-credit overseas study and/or overseas work experience defined as internships and cooperative work programs.

During the 2017 spring semester, Olivia Goss studied abroad in Newcastle, Australia. Newcastle is a coastal city two hours north of Sydney. Olivia said adjusting to life in another country in addition to the different course structure helped her find a new independence and strengths she didn't know she possessed.

While in Australia she managed to fit in as much traveling as possible. Visiting volcanoes in New Zealand, shark diving in Fiji, hiking in Tasmania and skydiving in Newcastle, she was able to find experiences wilder than she could have imagined.

Olivia says, "The experiences I gained through my study abroad will last a lifetime and every student who has the opportunity to study abroad should seize it!"

Junior I.E. student, Shay Brown, also studied abroad during the 2017 spring semester.

She went to IAU College in Aix-en-Provence, France. There she studied French and the wine industry. She shares, "I didn't know anyone going into my study abroad experience, and that was one of the best decisions I made. I was way outside my comfort zone, living in a foreign country, where I didn't speak the language very well…but that has allowed me to grow so much as an individual."

While there, Shay studied the different wine regions in the country, the various wine making processes as well as the distribution systems of wine and the differences between Europe and the rest of the world.

This was her second study abroad experience, having gone to Belize in summer 2015, and she encourages anyone thinking of trying it to "Do It! The people you meet and the experiences you have will have a huge impact on your life, in the best possible way."

Liaison Committee

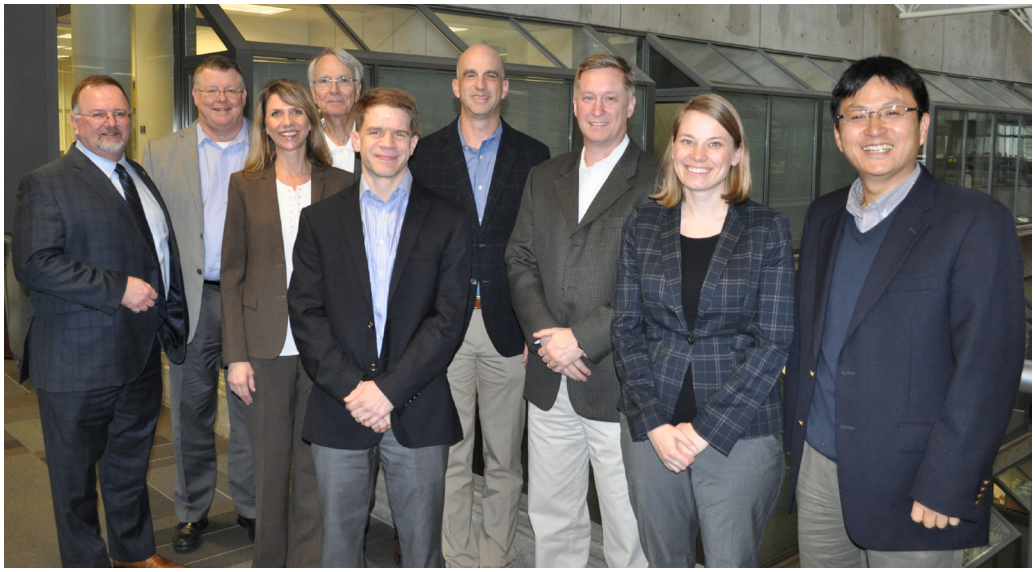
The Arkansas Academy of Industrial Engineering (AAIE) was founded in 1986 to recognize the achievements of University of Arkansas Industrial Engineering graduates and to provide continuing guidance and support to the Department of Industrial Engineering. The Academy also provides its members with the 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 AAIE organizes a Liaison Committee that serves as our 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 Industrial Engineering program at the University of Arkansas.

It is the opinion of this year's Liaison Committee that overall, the Industrial Engineering Department continues to be extremely successful in delivering its mission. Across the board, student, faculty, and staff successes over the past year are a testament to this. Departmental leadership remains strong and committed to continuous improvement.

Recent members of the Liaison Committee include:

- G. Kent Burnett, Senior Vice President of IT at Dillard's, retired.
- Ken Gaines, President and CEO of The Steco Corporation in Little Rock, AR.
- David Humphrey, Vice President of Investor Relations for ArcBest Corporation in Fort Smith, AR.
- Bill Klimack, Chevron Decision Analysis Funtional Manager.
- Angela Kuli, Owner, AHK Consulting.
- Jenn Pazour, Assistant Professor of Industrial and Systems Engineering at Rensselaer Polytechnic Institute.
- J. Cole Smith, Professor and Chair of the Industrial Engineering Department at Clemson University.
- Young-Jun Son, Professor and Deparment Head of Systems and Industrial Engineering at the University of Arizona.
- Ami Spivey, Senior Vice President of Walmart's Next Generation Supply Chain.
- Tarek Taha, Senior Director Engineering & Technology with J.B. Hunt.



Left to right: Ed Pohl - Industrial Engineering Department Head, Bill Klimack, Angela Kuli, G. Ken Burnett, J. Cole Smith, Tarek Taha, Ken Gaines, Jenn Pazour and Young-Jun Son. (Not pictured: Ami Spivey)

Ways To Partner With IE...

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.

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 faculty and student time associated with 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 Senior Design Course, newly renamed Capstone Experience, 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

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

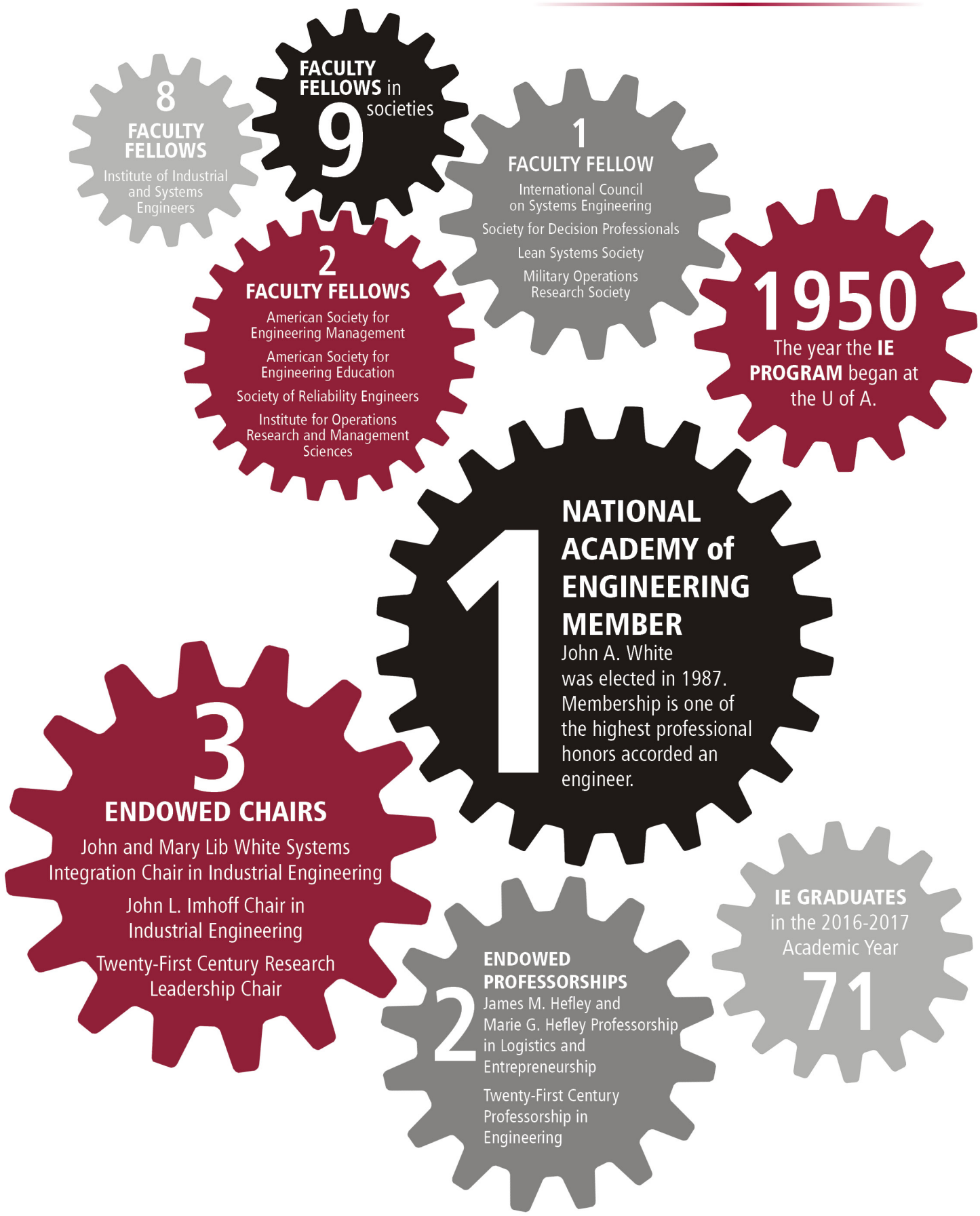
COOPERATIVE EDUCATION AND INTERNSHIPS

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: Kelsey Lavigne at klavigne@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

GEARED TOWARD *EXCELLENCE!*



Contact Information

Department of Industrial Engineering
4207 Bell Engineering Center • University of Arkansas • Fayetteville, AR 72701
Phone: (479) 575-3156 • Fax: (479) 575-8431
www.industrial-engineering.uark.edu

Faculty

C. Richard Cassady ..... cassady@uark.edu ..... (479) 575-6735

W. Art Chaovalitwongse ..... artchao@uark.edu ..... (479) 575-5857

Justin R. Chimka ..... jchimka@uark.edu ..... (479) 575-7392

John R. English ..... jre@uark.edu ..... (479) 575-3054

Carol S. Gattis ..... csg@uark.edu ..... (479) 575-3156

Joseph Geunes ..... jgeunes@uark.edu ..... (479) 575-6042

Haitao Liao ..... liao@uark.edu ..... (479) 575-6196

Xiao Liu ..... xl027@uark.edu ..... (479) 575-6033

Ashlea Bennett Milburn ..... ashlea@uark.edu ..... (479) 575-3702

Heather Nachtmann ..... hln@uark.edu ..... (479) 575-5857

Kim LaScola Needy ..... kneedy@uark.edu ..... (479) 575-7762

Sarah Nurre ..... snurre@uark.edu ..... (479) 575-3940

Greg S. Parnell ..... gparnell@uark.edu ..... (479) 575-7423

Harry A. Pierson ..... hapierso@uark.edu ..... (479) 575-6034

Edward A. Pohl ..... epohl@uark.edu ..... (479) 575-6029

Letitia (Tish) Pohl ..... lpohl@uark.edu ..... (479) 575-4208

Chase Rainwater ..... cer@uark.edu ..... (479) 575-2687

Manuel D. Rossetti ..... rossetti@uark.edu ..... (479) 575-6756

Kelly Sullivan ..... ksulliv@uark.edu ..... (479) 575-2563

John A. White ..... jawhite@uark.edu ..... (479) 575-2773

Shengfan Zhang ..... shengfan@uark.edu ..... (479) 575-3571

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:

EMILY WOOD • DIRECTOR OF DEVELOPMENT • EEWOOD@UARK.EDU • 479-575-3075