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College of Engineering

2018-2019

Annual Report



UNIVERSITY OF
ARKANSAS®

College of Engineering

September 1, 2019

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College of Engineering 2018 Annual Report

I. Executive Summary

College of Engineering faculty, staff and students continue to represent the College and University well through their leadership and success across a wide variety of areas.

Engineering researchers had a record-breaking year. Faculty, staff and students earned \$29.5 million in new research grants in FY19, surpassing the previous high of \$28.7 million, and up nearly \$7 million from 2018.

Ajay Malshe, distinguished professor of mechanical engineering, was inducted into the National Academy of Engineering, the highest professional honor given to an engineer. He joined the NAE alongside Amazon CEO Jeff Bezos and Google Principal Scientist Martin Abadi.

Engineering students also saw considerable success in the classroom and beyond. Several students won national recognition for their scholarship and leadership, including two Goldwater Scholarships and a Truman Scholarship.

Our alumni also continue to make us proud for their success as professionals and community leaders. Biomedical Engineering alumnus Jared Greer's startup, Lapovations, continues to grow with new investment from the National Science Foundation as his interdisciplinary team works to improve how laparoscopic surgery is performed. Industrial Engineering alumnus Willie Montgomery III, a top data scientist at Walmart, was also named a Presidential Leadership Scholar, a prestigious national recognition given to only 60 people annually.

Finally, the Data Science Advisory Committee met for the first time in the fall of 2018. Industry and academic stakeholders convened on campus and digitally to chart the course for developing an undergraduate degree in Data Science. The University of Arkansas B.S. Data Science Program stemmed from the recognized need, in Arkansas (and nationally and internationally) for a workforce of trained data scientists for technical, business, social, and operational success. This is a collaborative program developed by the College of Engineering, the Sam M. Walton College of Business, and the J. William Fulbright College of Arts and Sciences, and has the benefit of an Advisory Committee of senior leaders in companies of all sizes, community organizations, and state government. The target is to officially start in Fall 2020 with an opportunity to begin offering courses earlier if approved. The program is designed with a Core ("hub") curriculum and an initial set of Concentrations ("spokes") with well-defined outcomes for both Core and Concentrations. The "hub and spoke" model was chosen to ensure that all graduates had the rigorous core and then as new concentration needs were identified, they could be integrated into the program in a straight-forward manner. The current concentrations

are: Accounting Analytics, Bioinformatics, Biomedical and Healthcare Informatics, Business Data Analytics, Computational Analytics, Data Science Statistics, Geospatial Data Analytics, Operations Analytics, Social Data Analytics, Supply Chain Analytics.

These successes are only a few highlights of the breadth of accomplishment from the College of Engineering in 2019, and the College looks forward to building on these successes in the coming year.

II. Summary of Significant Achievements

- Three engineering faculty members earned the prestigious Faculty Early Career Development Award from the National Science Foundation. Biomedical engineering assistant professors Narasimhan Rajaram and Kyle Quinn each earned the award, alongside electrical engineering's Fang Luo. That brings the total to 10 CAREER awardees in the last two years.
- The College of Engineering produced all-time high research output for fiscal year 2019. Students, staff and faculty earned \$29.5 million in new research grants, up from \$22.7 million in FY18 and surpassing the previous high of \$28.7 million.
- The College also set a record for invention disclosures with 31, beating the previous record of 21, set in FY18.
- Ten patents were awarded in the College of Engineering in FY19, up from the previous high of six.
- Dr. Benjamin Runkle, advisor to the Out in Science, Technology, Engineering and Mathematics student organization, known as oSTEM, traveled to Houston, Texas, with nine students in November 2018 to receive the oSTEM 2018 Rookie Chapter of the Year Award. The national oSTEM organization praised the chapter for "acting as a crucial and convenient source of social activity, networking, comfort, as well as academic and professional development for the LGBTQ-plus student community in Northwest Arkansas."
- Computer Science and Computer Engineering's Dr. Jia Di (PI) and his team received a five-year, \$4.63 million award from the National Science Foundation to create a program to train cybersecurity professionals.
- Two faculty members were named fellows in professional organizations, representing the highest honor in their fields. Industrial Engineering professors Ed Pohl and Haitao Laio were named fellows in the American Society of Engineering Management and the Institute of Industrial and Systems Engineers, respectively. College of Engineering faculty members now hold nearly 70 fellowships in professional societies.

III. Summary of Achievements in Teaching, Research and Public Service

- Associate Professor Dr. Sammy Sadaka was named “Engineer of the Year” by the Arkansas Section of the American Society of Agricultural and Biological Engineers (ASABE). Dr. Sadaka is a part of the Division of Agriculture’s extension program.
- Dr. Yi Liang received the 2018 American Society of Agricultural and Biological Engineers Educational Aids Blue Ribbon. Dr. Liang is a part of the Division of Agriculture’s extension program.
- Biomedical engineering faculty members Narasimhan Rajaram and Kyle Quinn earned Faculty Early Career Development Awards, known as CAREER awards, from the National Science Foundation.
- The Department of Biomedical Engineering continues to develop a program focused on offering undergraduate students an opportunity to identify and implement real-world medical needs, through the innovative “clinical needs finding” course, which is now classified as a service learning course for its active community involvement.
- The MAST Membrane Center, a multi-campus NSF I/UCRC currently directed by Chemical Engineering Prof. Ranil Wickramasinghe, added Penn State as a fourth campus.
- Chemical Engineering Professor Ranil Wickramasinghe, Xiangong Qian (biomedical engineering), and Department Head David Ford hosted an international membrane symposium on campus in May 2019 with participation of faculty from four continents. At the symposium, an MOU with the Center for Membrane and Film Technology at Kobe University was signed by Associate Dean for Research Heather Nachtmann.
- Computer Science and Computer Engineering’s Dr. Jia Di (PI) and his team received a five-year, \$4.63 million award from the National Science Foundation to create a program to train cybersecurity professionals.
- The Department of Computer Science and Computer Engineering increased the population of female students by 26 percent from the previous year.
- Civil Engineering’s Clint Wood participated in a Geotechnical Extreme Events Reconnaissance (GEER) mission sponsored by NSF to examine the damage caused by the Mexico City earthquake.
- Civil Engineering’s Ernie Heymsfield was elected to a four-year position on ASCE Transportation and Development Institute (T&DI) Board of Governors. There are more than 16,000 ASCE T&DI members.
- Civil Engineering’s Panneer Selvam is the President of the Arkansas Academy of Sciences, the founding President of the International Academy of Fluid Mechanics, and Vice President of the Arkansas Renewable Energy Association.
- The Department of Electrical Engineering hosted the FEEDER Summer Institute in June 2019. The FEEDER Consortium consists of seven Southeast US Universities, eight

utility companies, ten supporting industry partners and two national labs. The purpose is to undertake curriculum development, education and training activities, and research aimed at widespread adoption of renewable energy resources and deployment of smart grid technologies.

- Fang Luo, assistant professor of electrical engineering, earned a Faculty Early Career Development Award (CAREER) from the National Science Foundation.
- Mechanical Engineering's Ajay Malshe earned the NanoBusiness Alliance Lifetime Achievement Award.
- The Department of Industrial Engineering awarded \$156,000 in scholarships through their departmental scholarship program, an all-time high. Significant funding was provided by the department's distinguished alumni group, the Arkansas Academy of Industrial Engineering (AAIE) and by its members.
- The Industrial Engineering department implemented an interdisciplinary minor in Data Analytics. Many students have already completed the minor.
- Ed Pohl was inducted as a Fellow of the American Society for Engineering Management.
- Kim Needy was honored twice at the annual Institute of Industrial and Systems Engineers (IISE) conference. She earned the Albert G. Holzman Distinguished Educator Award and the Engineering Economy Wellington Award for her long-term contributions and service to the field. Also at IISE, Tish Pohl was recognized with the Engineering Economy Division Teaching Award and Haitao Liao was named Fellow of IISE.

IV. Summary of Achievements of Students and Alumni

- A Senior Design Team was awarded 2nd place in the G.B. Gunlogson Environmental Student Design Open Competition at the ASABE Annual International Meeting in Detroit for their work on designing a Low Impact Development solution to a city parking in Fayetteville. The engineering team was comprised of students Allison Sites, McKenna Belcher, Samuel Lahodny, and Kami Parmenter and was advised by Assistant Professor Benjamin Runkle.
- Biomedical engineering graduate student Ishita Tandon received an American Heart Association Fellowship, mentored by Kartik Balachandran.
- Biomedical engineering's Harrison Dean won the Summer Undergraduate Research Fellowship from the American Heart Association, mentored by chemical engineering professor Heather Walker.
- Biomedical engineering undergraduate student Samia Ismail was awarded the Truman Scholarship, mentored by Nicole Clowney.
- Biomedical engineering alumni Jared Greer received \$300,000 in National Startup Competitions and \$225,000 NSF-SBIR Phase I for his startup, Lapovations.

- Chemical Engineering undergraduate Haley Knighten led the first ‘Women in STEM Week’ at the U of A. This mid-November event engaged the broader campus and town communities with activities ranging from personal development workshops, to a K-5 evening camp, to a talk entitled “Sowing the Seeds of Diversity in Engineering” by Dr. Jennifer Curtis, Dean of Engineering at UC Davis.
- Rising chemical engineering junior Meagan Olsen was named a 2019-2020 Goldwater Scholar.
- Chemical Engineering undergraduate students Christina Trexler and Haley Knighten won first place for their short video at Planet Forward Storyfest 2019.
- Computer science major Austin Kreulach was named a 2019 Goldwater Scholar.
- Electrical engineering alumnus Gonzalo Arce was named a Fellow of SPIE, the International Society for Optics and Photonics.
- Electrical engineering students brought home first and third place awards in the ethics competition at the IEEE Region 5 competition in Lafayette, Louisiana.
- Mechanical engineering alumnus Drew Fleming earned the 2018 Edmond E. Bisson Award for Best Paper from the Society of Tribology and Lubrication Engineers.
- Undergraduate mechanical engineering student Cole Williams earned the Fraternal Order of Police Citizen of the Year Award.
- Mechanical engineering alumni Wenyang Zhang and Parash Kalita earned the Society of Manufacturing Engineers Outstanding Young Manufacturing Awards.
- A team of Industrial Engineering students, comprised of Nathan Hemby, Olivia Ohlstein, and Parker Galligan, beat out 10 teams from across the country to take the top spot in a national video competition hosted by the Institute of Industrial and Systems Engineers (IISE).
- At the IISE conference in May, U of A Industrial Engineering students received 10 of the 44 scholarships awarded, for a total of \$19,500. Conner Waybright, Clay Ferguson, Kevin Haney, Amie Westerman, Chelsea Jin, Alexander Hendrickson, Wesley Nimmo, Medline Suellentrop, Ollie Kwizera, and Patrick Dougherty were awarded 24% of the total scholarships given (\$82,500).
- Industrial Engineering’s Willie Montgomery was also selected as a Presidential Leadership Scholar. He was one of 60 people chosen nationwide.

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APPENDIX A

**FACULTY HONORS
2018-2019 COLLEGE OF ENGINEERING**

COLLEGE OF ENGINEERING OUTSTANDING TEACHER

Scott Osborn, Biological & Agricultural Engineering
Narasimhan Rajaram, Biomedical Engineering
Heather Walker, Chemical Engineering
Wen Zhang, Civil Engineering
Dale Thompson, Computer Science and Computer Engineering
Robert Saunders, Electrical Engineering
Ashlea Milburn, Industrial Engineering
Paul Millett, Mechanical Engineering

COLLEGE OF ENGINEERING OUTSTANDING RESEARCHER

Yanbin Li, Biological & Agricultural Engineering
Kyle Quinn, Biomedical Engineering
Ranil Wickramashinghe, Chemical Engineering
Gary Prinz, Civil Engineering
Qinghua Li, Computer Science and Computer Engineering
Yue Zhao, Electrical Engineering
Chase Rainwater, Industrial Engineering
Min Zou, Mechanical Engineering

COLLEGE OF ENGINEERING OUTSTANDING SERVICE TO STUDENTS

Thomas Costello, Biological & Agricultural Engineering
Jeff Wolchok, Biomedical Engineering
Natacha Souto, Chemical Engineering
Sarah Hernandez, Civil Engineering
Brajendra Panda, Computer Science and Computer Engineering
Alan Mantooth, Electrical Engineering
Kelly Sullivan, Industrial Engineering
Uche Wejinya, Mechanical Engineering

UNIVERSITY & COLLEGE AWARDS

Greg Thoma	2018-19 John Imhoff Outstanding Research Award
Jamie Hestekin	2018-19 Collaborative Research Faculty Award
Kyle Quinn	2018-19 Rising Star Award
Ashlea Milburn	2018-19 Rising Teaching Award
Alan Mantooth	2018-19 Outstanding Public Service Award

APPENDIX B

2018-2019 COLLEGE OF ENGINEERING STUDENT HONORS

COLLEGE OF ENGINEERING FIRST RANKED SENIOR SCHOLARS

Sameer Kalkami	Mechanical Engineering
Juan Carlos Rodriguez	Chemical Engineering
Cole Sherrill	Computer Science and Computer Engineering

COLLEGE OF ENGINEERING SENIOR SCHOLARS

Mason James Belue	Biomedical Engineering
Mary Kathryn Brandecker	Biomedical Engineering
Brett James Glenn	Mechanical Engineering
Roderick Amir Gomez Jimenez	Electrical Engineering
Jake Michael Grawe	Mechanical Engineering
Ibrahim Ben Kais Guiga	Chemical Engineering
Morgan McKenna Hartsell	Industrial Engineering
Jackson Cole Hedrick	Biomedical Engineering
Emily A. Janowski	Biomedical Engineering
Adam Marcus Johnson	Chemical Engineering
Sawyer Wayne Keller	Electrical Engineering
Thomas Josef Krumpoic	Chemical Engineering
Joshua Andrew McArthur	Mechanical Engineering
Alexander D. O'Brien	Chemical Engineering
Jared Mark Poe	Mechanical Engineering
Nicholas Patrick Reed	Electrical Engineering
Joshua Alvin Ritchie	Mechanical Engineering
Clara E. Somerville	Chemical Engineering
Paul Randall Swearingen	Electrical Engineering
Natalie Von Tress	Biological and Agricultural Engineering
Kevin Alan Weston	Civil Engineering

COLLEGE OF ENGINEERING OUTSTANDING SENIOR

Olga Brazhkina	Biomedical Engineering
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DEPARTMENTAL OUTSTANDING SENIORS

Natalie Von Tress	Biological and Agricultural Engineering
Olga Brazhkina	Biomedical Engineering
Alexander O'Brien	Chemical Engineering
Cole Sherrill	Computer Science and Computer Engineering
Olivia Degner	Computer Science and Computer Engineering
Khandi Gordon	Civil Engineering
Paul Swearingen	Electrical Engineering

Morgan Hartsell
Brett Glenn

Industrial Engineering
Mechanical Engineering

PORTER STONE CO-OP AWARDS

Alexander Ahlbrandt
Theodore Christian
Anthony Gunderman
Trevor Mackey

Computer Science and Computer Engineering
Mechanical Engineering
Mechanical Engineering
Mechanical Engineering

PRESIDENTIAL SCHOLAR

Jarrod Eisma

Biomedical Engineering

GOLDWATER SCHOLARS

Austin Kreulach
Megan Olsen

Computer Science and Computer Engineering
Chemical Engineering

TRUMAN SCHOLARS

Samia Ismail

Biomedical Engineering

APPENDIX C

**COLLEGE OF ENGINEERING
CHAIRS, PROFESSORSHIPS, DISTINGUISHED PROFESSORSHIPS AND
LECTURESHIPS**

Charles D. Morgan/Axiom Endowed Graduate Research Chair in Data Base, Xintao Wu, Professor, Computer Science and Computer Engineering

Irma F. and Raymond F. Giffels Endowed Chair in Engineering, John R. English, Professor, Industrial Engineering & Dean of Engineering

John L. Imhoff Endowed Chair in Industrial Engineering, Kelly Sullivan, Associate Professor, Industrial Engineering

Maurice E. Barker Endowed Chair in Chemical Process Safety and the Environmental Fate of Chemicals, Tom Spicer, Distinguished Professor, Chemical Engineering

Rodger S. Kline Endowed Chair in Computer Science and Computer Engineering, Frank Liu, Professor, Computer Science and Computer Engineering

The Twenty-First Century Endowed Chair in Materials, Manufacturing and Integrated Systems, Ajay Malshe, Distinguished Professor, Mechanical Engineering

The Twenty-First Century Research Leadership Chair, Alan Mantooth, Professor, Electrical Engineering

The Twenty-First Century Leadership Chair in Mechanical Engineering, Darin Nutter, Professor, Mechanical Engineering

The Twenty-First Century Leadership Endowed Leadership Chair, Micah Hale, Professor, Civil Engineering

Walter E. Hicks and Blossom Russell Hicks Professorship for Infrastructure Engineering, Kevin D. Hall, Professor, Civil Engineering

Bates Teaching Endowed Professorship in Chemical Engineering, Greg Thoma, Professor, Chemical Engineering

James T. Womble Endowed Professorship in Computational Mechanics and Nanotechnology Modeling, R. Panneer Selvam, Professor, Civil Engineering

The Twenty-First Century Professorship in Engineering, Ed Pohl, Professor, Industrial Engineering

Thomas Clinton Mullins Endowed Chair in Engineering, David Andrews, Professor, Computer Science and Computer Engineering

The Twenty First Century Professorship in Mechanical Engineering, Arun Nair, Assistant Professor, Mechanical Engineering

The Twenty First Century Professorship in Mechanical Engineering, Min Zou, Professor, Mechanical Engineering

The Twenty First Century Professorship in Mechanical Engineering, Steve Tung, Professor, Mechanical Engineering

Ross E. Martin Endowed Chair in Emerging Technologies, Ranil Wickramasinghe, Professor, Chemical Engineering

John A. White Term Chair, John A. White, Distinguished Professor, Industrial Engineering

Ansel and Virginia Condray Endowed Professorship in Biochemical and Chemical Separations, Christa Hestekin, Associate Professor, Chemical Engineering

The Twenty-First Century Leadership Chair in Electrical Engineering, Juan Balda, University Professor, Electrical Engineering

George M. and Boyce W. Billingsley Endowed Chair in Engineering, Raj Rao, Professor, Biomedical Engineering

Ralph E. Martin Endowed Leadership Chair in Chemical Engineering, Lauren Greenlee, Professor, Chemical Engineering

The Twenty-First Century Research Leadership Chair, Jia Di, Professor, Computer Science and Computer Engineering

Tyson Endowed Chair in Biosensing Engineering, Yanbin Li, Professor, Biological and Agricultural Engineering

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

The Twenty-First Century Research Leadership Chair, Art Chaovallitwongse, Professor, Industrial Engineering

Earl J. and Lillian P. Dyess Endowed Chair in Engineering, Heather Nachtmann, Professor, Industrial Engineering and Associate Dean, College of Engineering

Ray C. Adam Endowed Chair in Chemical Engineering, Jorge Almodavar, Assistant Professor, Chemical Engineering

Robert E. Babcock, Sr. Endowed Professorship in Chemical Process Safety and the Environmental Fate of Chemicals, Audie Thompson, Assistant Professor, Chemical Engineering

Ralph E. Martin Endowed Professorship in Chemical Process Engineering, Jamie Hestekin, Professor, Chemical Engineering

The Twenty-First Century Endowed Professorship in Biomedical Engineering, Chris Nelson, Assistant Professor, Biomedical Engineering

Kevin W. and Marie L. Brown Department Head Chair in Chemical Engineering, Dave Ford, Professor, Chemical Engineering

Vacant Chairs

Charles W. Oxford Endowed Professorship in Emerging Technologies

Jim L. Turpin Endowed Professorship in Chemical and Biochemical Separations

Louis Owen Endowed Professorship in Green Chemical Process Design and Development

James M. Hefley and Marie G. Hefley Endowed Professorship in Logistics and Entrepreneurship