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## **Evidence Document**

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Academic Affairs

College of Engineering

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## **Engineering Innovator Spring 2018**

**A publication of Wichita State University's  
College of Engineering**

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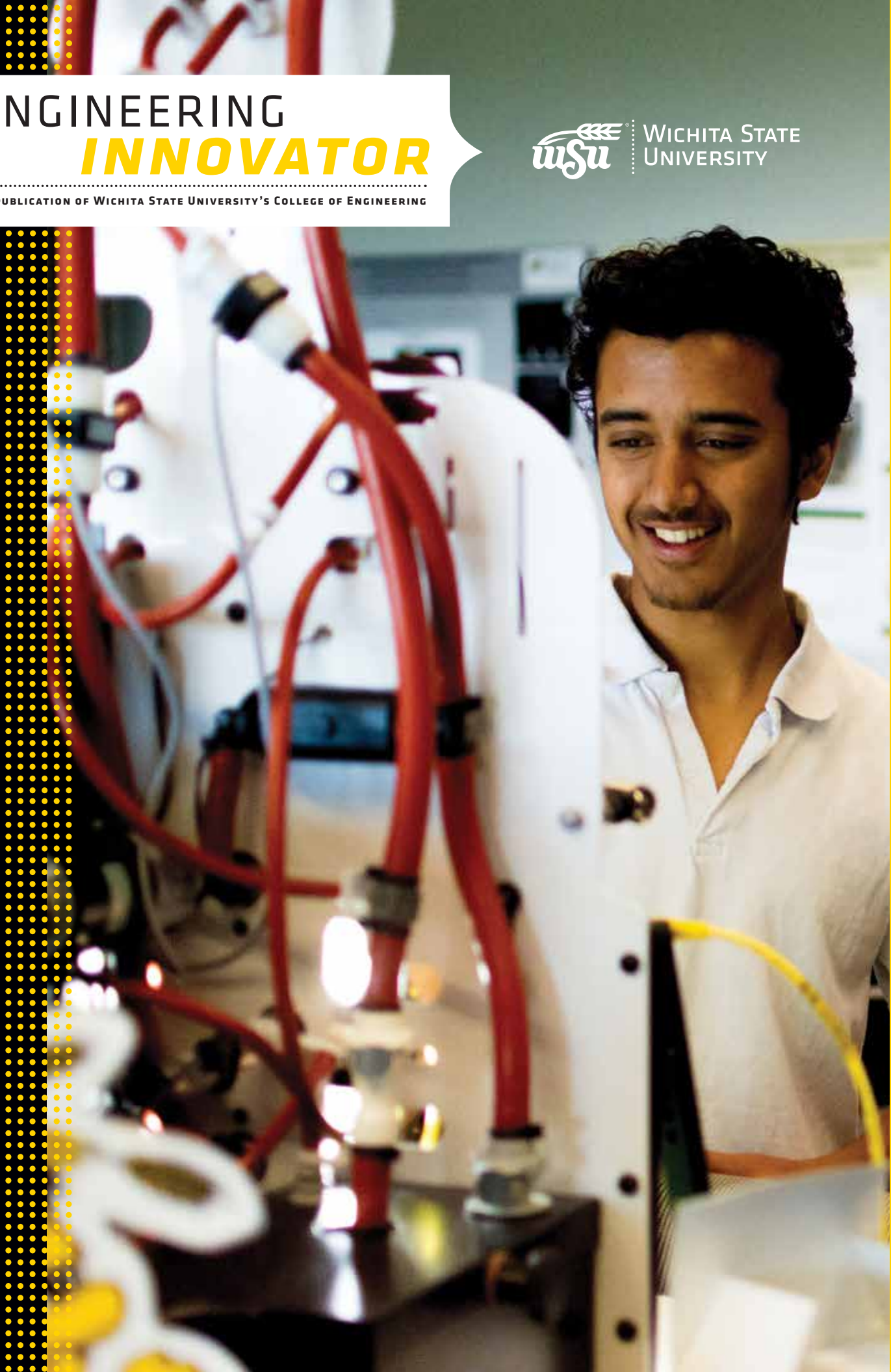
**Additional information:**

# ENGINEERING **INNOVATOR**

A PUBLICATION OF WICHITA STATE UNIVERSITY'S COLLEGE OF ENGINEERING

 WICHITA STATE  
UNIVERSITY

SPRING 2018





WICHITA STATE  
UNIVERSITY

# ENGINEERING INNOVATOR

A PUBLICATION OF WICHITA STATE UNIVERSITY'S COLLEGE OF ENGINEERING

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**ON THE COVER:** Subash Bhandari, a sophomore biomedical engineering major, works as an undergraduate research fellow in the Biomedical Sensors, Imaging, Modeling, and Engineering (BioME) Lab. Read more about his story inside.  
*Photo by Ashwin Govindarajan*

**ENGINEERING INNOVATOR**  
SPRING 2018

**WICHITA STATE UNIVERSITY**  
**COLLEGE OF ENGINEERING**  
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# DEAN'S MESSAGE



**ROYCE BOWDEN**  
DEAN OF ENGINEERING

Several years ago the Kansas Legislature tasked Wichita State University, Kansas State University and the University of Kansas with increasing the number of engineering graduates. A shortage of engineers has been a national concern among professional societies, federal agencies and private industry for decades. I am proud to announce that for the fourth year in a row, the WSU College of Engineering has set a record number of undergraduate engineering degrees conferred (305 in AY2017) and undergraduate enrollment has also reached record levels (2,241 in AY2017).

These accomplishments are the result of hard work on the part of faculty and staff who are constantly evaluating and re-evaluating the way we do things, in order to better attract and retain students, and better equip and train future engineers and computer scientists with the skillset, mindset and experience to advance economic and technological prosperity, health and well-being in Kansas and beyond.

This issue of the Engineering Innovator describes several of the innovative approaches we are using to recruit, retain and educate future graduates who become innovators and difference-makers. These include efforts like our outreach into elementary schools to teach coding, and our 2+2 agreements that ensure students who graduate from community colleges can earn a degree from the College of Engineering in two years.

And you will meet several students, graduates and faculty who embody the entrepreneurial spirit of our program. They are students like Diego Garcia, whose response to an uncertain immigration status was to complete a degree within three years, and faculty like Eshan Salari, who is developing new ways to target cancer cells with radiation therapy, and alumni like Alex Kanelakos, who has become NASA's leading expert on space walks.

These are stories of people who aspire and persist, imagine and create, maintain and grow, and we are proud to call them Shockers.

With cheerful service,  
Royce O. Bowden, Ph.D.  
professor and dean

# STUDENT SERVICE PROJECT, OTHERS HONORED FOR INNOVATION

College of Engineering faculty and staff were among several recognized in October at the third annual Innovation Awards, presented to those who have adopted and advanced the Innovation University concept.

## COMMUNITY PARTNER AWARD

**Go Baby Go** received the Community Partner Award for its innovative approach to providing students hands-on, applied engineering, cross-disciplinary collaborative experience that serves the community. A national program that creates modified ride-on toy cars for young children with mobility issues, Go Baby Go was introduced at Wichita State by **Samantha Corcoran**, engineering educator, and **Nathan Smith**, lab manager, in spring 2016.

Since then, the College of Engineering program has evolved to involve both engineering students, physical therapy students, and high school participants through engineering classes, a student organization and a Go Baby Go-themed summer camp, producing cars for more than 45 children with disabilities.

Corcoran hopes to get more students involved in the program and hopes to branch out toward different majors, inviting communications students to assist with marketing, and Spanish students to translate for Spanish-speaking families.

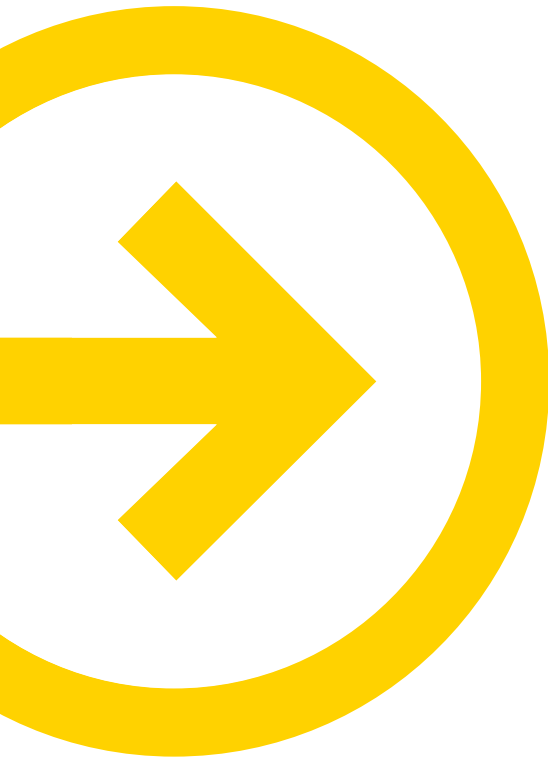
**Learn more at [wichita.edu/gobabygo](http://wichita.edu/gobabygo)**



*From left to right, Debbie Franklin, director of strategic university initiatives, Samantha Corcoran, engineering educator, and Nathan Smith, lab manager.*



*Nathan Smith, right, and a team of WSU students present a redesigned car to a child through the Go Baby Go program.*



*Kara McClusky,  
engineering educator.*

### SHOCKER INNOVATION CORPS MENTOR

Faculty acting as academic leads are an essential component to the success of the teams in Shocker Innovation Corps, a National Science Foundation program. **Kara McClusky**, engineering educator in the Department of Engineering Technology, has served as the academic lead for multiple teams and regularly promotes Shocker Innovation Corps and encourages students to learn about, and apply to participate in, the program.



*Austin Nordyke*

### BRIGHT FUTURES AWARD

The Bright Futures Award is given to the one outstanding student from each college. In the College of Engineering, the recipient was **Austin Nordyke**, a junior. He is the team lead for the WSU Koch Innovation Challenge team "Out Cold," which invented a customizable pillow to reduce sleep discomfort. Nordyke's team won the grand champion award and advanced to the semi-finals in a national-level competition. Nordyke was also selected for this award because he was named a 2017 American Star in Agribusiness by the Future Farmers of America, which recognized him for starting and managing a successful lawn mowing business.



*Dr. Gary Brooking,  
director, Engineering  
Technology*

### AMBASSADOR AWARD

Given to individuals and departments that embrace the Innovation University concept and reach beyond departmental boundaries, the Ambassador Award was given to **Dr. Gary Brooking**, director, Engineering Technology. Dr. Brooking acts as a mentor and advisor for the Shocker Startup student entrepreneurship organization, facilitating for Shocker Innovation Corps and judging the Koch Innovation Challenge. He routinely works with the Center for Entrepreneurship to bring startup programs and ideas to campus. His capstone class is jointly taught with the Barton School of Business, and working in concert with the entrepreneurship capstone class to create multi-disciplinary teams that enter ideas and products into the Shocker New Venture Competition.



*Dr. Ramazan  
Asmatulu and  
Vamsidhar Patlolla*

### PATENT AWARD

**Ramazan Asmatulu**, professor of mechanical engineering, and **Vamsidhar Patlolla**, a doctoral student in mechanical engineering, received a patent for their work in composite recycling. Currently, there is a significant amount of waste going to landfills generated during the manufacture of certain composite fibers. Asmatulu and Patlolla created a method for reducing waste by using sound energy to remove resin from the fibers in a solvent. This innovation is licensed to Vamsidhar and his colleagues' start-up, Shocker Composites.



*From left to right, Debbie Franklin, director of strategic university initiatives, and Hal Plueneke, Dr. Vis Madhavan, and Jordan Newby of Fairmount Technologies.*

### FIRST DOLLAR AWARD

**Fairmount Technologies** received the First Dollar Award, given to a company that has received revenue from their innovation, either from customer sales or technology license. Fairmount Technologies, founded by **Dr. Vis Madhavan**, professor and Sam Bloomfield Chair in Engineering Innovation, has developed a patented process and prototype that creates metal extrusions at any length and curvature. In September, Fairmount Technologies produced and shipped their first revenue-producing parts.



# COE growth continues with remodel, new construction

Opened in January 2017 as the gateway to the Innovation Campus, the \$32M Experiential Engineering Building is often referred to as “the new building.” It is home to 25 hands-on laboratories, which provide Wichita State engineering students the ability to engage in hands-on learning, designed to inspire their creativity and an entrepreneurial way of thinking.

That “new building” designation will be short-lived, however, as construction began in March 2017 on an even newer building, known as Partnership Building 2, which by summer is expected to house the College of Engineering Student Success Center and Dean’s Office.

Privately developed, the new 46,400-square-foot building will provide office space to private industry looking to work in close proximity to Wichita State researchers,

faculty and students. The College of Engineering administrative and student service offices will take up about half the first floor of PB2, with the rest of the space reserved for private tenants.

This newest building will be situated directly north of the Experiential Engineering Building and west of the Partnership Building 1, which houses Airbus. Airbus’ 2-story, 90,000-square-foot building houses 300 employees working on Airbus commercial aircraft products, including significant design work on the next-generation A350 XWB.

“We look forward to providing our students with new, vibrant spaces for student organizations, tutoring and mentoring programs,” Dean Royce Bowden said of the new space.

Student spaces are also the focus of a refresh and remodel project in Wallace Hall, being financed with a \$1 million gift from the Dwane and Velma Wallace Foundation. Built in the 1970s, Wallace Hall has not had significant renovation since then. Phase 1, now complete, provides a clean new look to the 2nd floor along with added furniture and lighting to create new gathering spaces for students. Phase 2, due to be complete by 2019, will involve extensive renovation of Wallace Hall’s 1st floor.



*A renovation of the 2nd floor of Wallace Hall includes the addition of several gathering places for students. The spaces incorporate splashes of color, striking patterned furniture and decorative lighting.*



## Koch Challenge winners advance to national semi finals



Students who won the 2017 Koch Innovation grand championship advanced to the semi-finals of the Collegiate Entrepreneurs' Organization National Conference Pitch Competition, held in Tampa Florida in October 2017.

Team members were Austin Nordyke, Jacob Kimble and Braden Bohl. The students developed "Out Cold," a customizable pillow with air chambers that helps reduce sleep discomfort.

Associate Dean Steven Skinner said reaching the semi-finals was a significant accomplishment for the team, achieved by only 20 percent of the national competition's participants.

"Giving the pitch was great, and I had a lot of fun doing it," said Bohl. "It was fun listening to others give a pitch of their ideas or companies, and interesting because some of them came from all over the country, and all had very different ideas. This was a fantastic, and wonderful experience. A big thanks to WSU, as well as Koch, for allowing us to go on this amazing trip!"

The Koch Innovation Challenge is made possible thanks to a \$1 million gift from the Koch Foundation. The annual competition supports the Wichita State University College of Engineering in fostering a culture of creativity, innovation, entrepreneurship and teamwork among students.

Cross-disciplinary teams of new freshmen and transfer students studying engineering, art and design, business and other disciplines compete for funding and scholarships to invent products and technologies via a first-year student introductory course. Each team must submit a basic business plan or opportunity statement to determine market size, profitability and commercialization potential.

## WSU start-up lands \$1M DoD contract

Fairmount Technologies, located in Donald H. Beggs Hall, received a new contract with the Department of Defense to further develop its portfolio of manufacturing technologies for discrete part manufacturing.

The \$1 million contract is for building the prototype for the machining concept that was proven through a successful phase I Small Business Innovation Research award to improve machining of long, complex-shaped parts used in aircraft manufacturing.

The machining project uses advanced sensing technologies to correct the machining path of the tool in real time. The goal is to reduce loss of materials due

to machining failure, set-up cost and lead time for manufacturing multiple parts or one-off spares.

Fairmount Technologies was founded in 2008 by Dr. Vis Madhavan, professor, and Sam Bloomfield Chair in Engineering Innovation. Madhavan is one of the inventors of the Stretch Roll Forming process, a manufacturing innovation with the potential to revolutionize the process of bending extrusions into components.

This process allows parts to be produced rapidly using computer numerical control programs instead of part-specific dies, at lower production and environmental cost, with improved quality and increased accuracy.

Mahdi Kashani, general manager at Fairmount Technologies, attributes much of the company's success to its WSU location.

"The pool of excellent employees who are current or former WSU students is a valuable asset to Fairmount Technologies," said Kashani, who received his own Ph.D. from

WSU. "It delivers motivated and skilled people that makes our success possible."

The company employs 13 people, including three WSU graduates and five WSU student interns.

Fairmount Technologies is certified to design and manufacture components and assemblies for the aerospace and defense industries.

**More information can be found at [www.fairmounttech.com](http://www.fairmounttech.com).**



*John Doll, product design engineer, and Cassie Shaw, lead electrical engineer, compare a machined extrusion to computer data used to specify its geometry.*



# Transfers offered opportunity for degree in four years

With its goal to create more engineering graduates for the state of Kansas, the WSU College of Engineering is taking an innovative approach to attract transfer students, establishing agreements with community colleges that ensure students who transfer from partner institutions can complete an engineering or computer science degree from Wichita State University within two more years.

Agreements with five institutions were signed last fall—with Cowley College, Pratt Community College, Butler Community College, Wichita Area Technical College, and Sri Lanka Institute of Information Technology (SLIIT.) More partnerships between WSU and area community colleges are planned for the future.

Typically when students transfer from a community college to a four-year program, there are courses at the sophomore level that still need to be taken. This results in many transfer students taking longer than two years to complete the program. These 2+2 agreements ensure students don't spend time or money on classes that aren't a good fit for their final goals.

Under the agreements, students can take two years of courses, earning an associate's degree, and finish with a four-year degree at Wichita State two years later.

"Having relationships like this will streamline a transfer student's path to a B.S. degree," said Dr. Steven Skinner, associate dean of engineering, who helped establish the agreements.

The 2+2 agreements are part of a broader effort by the College of Engineering to recruit from community colleges. To this end, during 2016-17, a COE representative visited all 20 Kansas community colleges at least once, focusing on visits to pre-engineering core courses.

## SIGNED AGREEMENTS

### ***Butler Community College***

- Computer Engineering
- Computer Science
- Electrical Engineering
- Industrial Engineering
- Manufacturing Engineering
- Engineering Technology – Mechatronics
- Engineering Technology – Civil Engineering Technology
- Engineering Technology – Management

### ***Cowley College***

- Computer Engineering
- Electrical Engineering
- Computer Science
- Industrial Engineering
- Manufacturing Engineering

### ***Pratt College***

- Engineering Technology–Mechatronics
- Engineering Technology–Management

### ***Sri Lanka Institute of Information Technologies***

- Engineering Technology – Mechatronics
- Industrial Engineering

### ***Wichita Area Technical College***

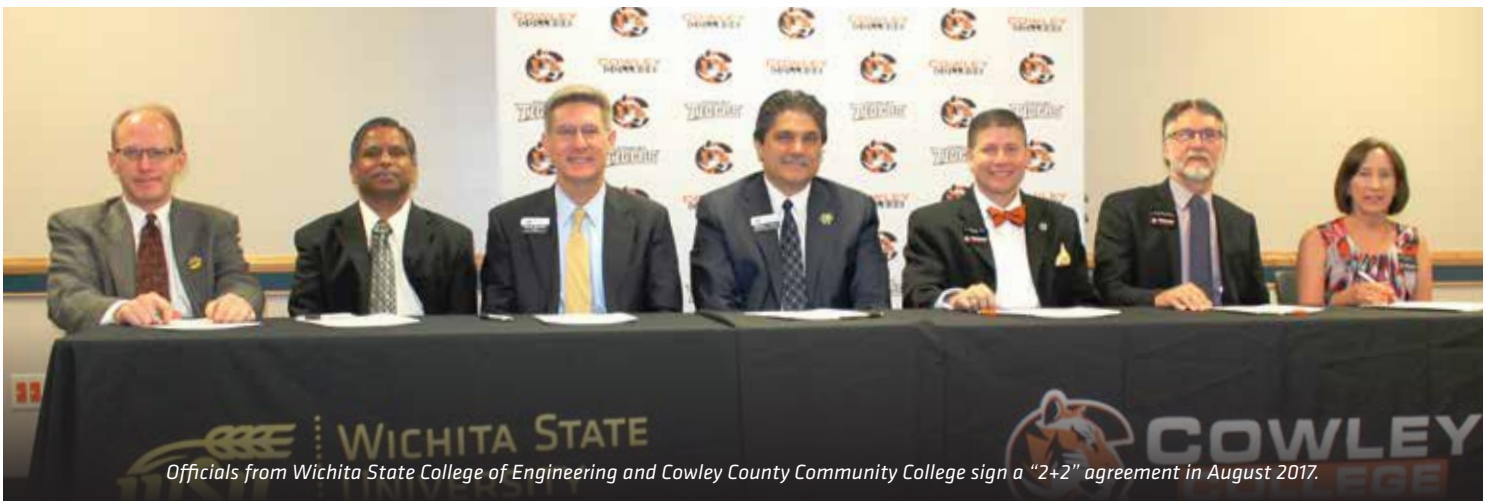
- Engineering Technology – Mechatronics
- Engineering Technology – Management

## PENDING AGREEMENTS

### ***Hutchinson Community College***

- Computer Engineering
- Computer Science
- Electrical Engineering
- Industrial and Manufacturing Engineering

WSU is also working on 2+2 agreements with other community colleges in Kansas.





## HUND RECOGNIZED AMONG TOP STUDENTS GLOBALLY

Hannah Hund, a senior majoring in biomedical engineering and violin performance, first became a University Innovation Fellow (UIF), sponsored by the College of Engineering, in 2015. Now she is being recognized as one of the top fellows out of 1,200 worldwide.

The University Innovation Fellows program is a global program run by Stanford University that empowers student leaders to increase campus engagement with innovation, entrepreneurship, creativity and design thinking.

It is affiliated with the Pathways to Innovation program, also run out of Stanford, which is designed to help higher education institutions fully incorporate innovation and entrepreneurship into undergraduate engineering. WSU's College of Engineering was named a Pathways institution in 2015.

Hund, along with fellow Shocker LaRissa Lawrie, a graduate student in communications, are among 23 fellows hand-selected out of an international community of more than 1,200 fellows for the impact they have had at their schools and for their contributions to the movement. This elite group was chosen to present about their UIF work at the program's Silicon Valley Meetup in November 2017.

They gave presentations on their UIF work to all attendees, modeling for the new fellows the kind of impact they can have at their own schools. Additionally, their demonstrated organization and leadership skills

will be put to work as they lead and mentor teams of fellows from different areas of the world.

Hund spoke about her role in supporting entrepreneurship and design thinking at Wichita State. She has led a number of initiatives, founding Shocker Startup, an on-campus organization that supports entrepreneurial students by connecting them with other students, faculty and mentors from a variety of university disciplines. She also organized *TedxWichitaStateUniversity*, an event held in May 2017 that featured nine speakers—drawn from students, faculty and the community—speaking on “Curiosity, Creativity and Connection.” Finally, she is a frequent organizer, competitor and winner of startup competitions.

Hund said she has benefitted greatly from the training she has received as a fellow and the opportunities created for her by WSU. “UIF has taught me to design organizations and events based not on what I think would be best, but what fellow students say that they need.

“A major goal of mine has been to promote collaboration across disciplines, because students I have interviewed voiced their desire to have extracurricular opportunities to work with students from other disciplines,” she said. “Students believe that working with multidisciplinary teams simulates the experiences that they will have in the workplace.”

## Engineering Council offers students a place to belong

The WSU Engineering Student Council was recognized as “Most Improved” at the National Association for Engineering Student Council’s regional conference in November.

“This stems from our group growing from four on the executive board to current member base of over 20,” said Levi Lowe, a sophomore computer science major now serving as Engineering Council president.

The Engineering Council acts as the official organization of the student body of the College of Engineering. It serves as a liaison between students, faculty and alumni, acting as a foundation for the broader College of Engineering community. Immediate efforts focus on hosting events that bring people together, such as the Pumpkin Carving event in the fall and Engineering Week in the spring.

“Representing the students of the college and creating a community that every student feels they belong in is the most important goal of our organization,” said Lowe.

The group meets biweekly, on Fridays at 6 p.m. in the Experiential Engineering Lobby, and any engineering student is welcome. In the off weeks, the group socials are held in the same location on Fridays at 5:30 p.m.

*From left to right, Engineering Student Council officers, Levi Lowe, Kaelee Knoll, Whitney Warner, Jordan Kerr and Josh Richardson.*





# Anushiya Gomes

Anushiya Shiley Gomes is an international graduate student from Sri Lanka who loves reading business news and solving math problems. She received an undergraduate degree in international business, from Wichita State in 2015.

She decided to pursue a master's degree in industrial and manufacturing engineering with a focus in quality and reliability, an educational move that allows her to do what she enjoys. She is set to complete her degree in spring 2018.

This past summer she used her talent for gathering data and problem solving to determine manufacturing processes, staff requirements and production standards for Spirit AeroSystems as a supply chain logistics engineer. The main focus of her internship was to eliminate waste in production processes and improve performance. She also recommended methods for improving the utilization of utilities, materials and staff.

Gomes discovered this internship opportunity while browsing through job openings on Spirit's website. She decided to apply and is grateful for all the unique experiences she got as an employee.

"Plant and hangar tours are just mind-blowing," said Gomes. "I got the opportunity to be a part of, and work on, huge projects for the company."

The work experience Gomes gained from her time at Spirit allowed her to learn about things she wouldn't have found in a classroom. Her internship gave her opportunities to network with influential professionals, something Gomes found to have great value.

"The contacts you make today are critical in the future," said Gomes. "Internships are a great learning experience and they increase the likelihood of landing a full-time job after graduation. Remember, jobs don't come to you. You go to them."

Story: Jessa Ragan

Photo: Kristi Hahn-Regan

# Subash Bhandari

Subash Bhandari, a biomedical engineering sophomore, was one of two students invited to speak at WSU's second annual Academic Convocation—a ceremony intended to inspire students at the beginning of the school year to strive and persevere.

Bhandari described his childhood in Nepal, where he said he was bullied in school "because he was small and his parents were not financially strong."

Bhandari recalled, "It was my father who saw me through, the memory of those nights when I used to hold my father's index finger on the way home from school. The walk through a small forest, back in my country, would take 20 minutes. Those 20 minutes were when I had to answer my dad what 24 multiplied by 12 was, and what the longest river of the world was. Those were the same moments when my father told me to dream big, act strong and be responsible at any point in life."

His dream, Bhandari said, is to become a biomedical engineer who invents cost-effective medical devices, in order to save the lives of people at home, where people die because of lack of access to medical equipment and treatments they can afford.

He's well on his way. Bhandari is an undergraduate researcher in the Biomedical Sensors, Imaging, Modeling, and Engineering (BioME) Lab, directed by Dr. Kim Cluff, working to develop a skin patch biosensor to detect melanoma cancer.

Bhandari said tenacity got him to this point and offered this advice in his convocation speech: "If I know of something that can change you, it's your willpower. It's the hard work and dedication you put into the things you want to accomplish. It's never too early to begin things. Begin with something small. Influence a single person near you to do new things, to be innovative. Help them build connection with people. I want every person to believe that everything is possible in this world."



# Amy McClain

Before heading into her senior year at Wichita State, mechanical engineering major Amy McClain gained workplace experience as an engineering intern at Burns & McDonnell, an engineering consulting firm based in Kansas City, Missouri.

“I started out by just talking with a friend,” said McClain. “She wasn’t an engineering student, but was working as a receptionist in the Wichita Burns & McDonnell office. She asked me what major I was, and one thing led to another.”

McClain began her internship in the only position available at the time, a marketing position in the Wichita office. Although her position wasn’t specifically about engineering, McClain was able to work on engineering-related projects for manufacturing sites. Once an engineering position opened up for the summer, she moved back to the Kansas City metro area to start at Burns & McDonnell’s home office.

The company hires approximately 120 interns for their Kansas City office. McClain said her job duties ranged widely. One day she was working with mechanical HVAC and plumbing systems for manufacturing facilities by learning how they work and how they can be used in infrastructure. On another, she helped coordinate fun events with other KC companies in order to bond with other interns.

McClain said her involvement with Tau Beta Pi, Society of Woman Engineers, Delta Gamma, and Student Ambassador Society as a student ambassador at WSU taught her soft skills that helped her stand out at Burns & McDonnell.

“Academics are extremely important since companies are wanting that degree from you,” says McClain, “but I think overall, they don’t solely look at your course work because they want to see how your soft skills and your problem-solving skills carry over.”

McClain may pursue an MBA, or would consider becoming a mechanical engineer at Burns & McDonnell, if there’s an opening.

*Story: Sydney Payne  
Photo: Courtesy*



# Diego Garcia

Diego Garcia arrived in the United States at age four, brought here by his family from Durango, Mexico. He attended Wichita public schools, graduated from Wichita East High School in 2015, and hopes to complete his engineering technology degree at Wichita State in May.

Garcia said his status as a DACA student prompted him to finish his degree within three years. DACA refers to an immigration policy known as the Deferred Action for Childhood Arrivals, which allows those brought to the country illegally as minors to be protected from deportation and eligible for work permits. DACA protections are scheduled to expire this year unless Congress acts to extend them.

Garcia said DACA status allowed him to get a driver’s license and to work several jobs, including one as a YMCA soccer coach, which, along with scholarships, have paid for his education.

“I started taking college classes while still in high school, then taking 19-hour semesters and inter-session and summer courses. I did everything in my power to make sure I would graduate. Still, I would be lying if I said I did it alone. I’ve been blessed with incredible people in my life who have gone out of their way to help me.”

One of those was his advisor at WSU. “The advisor I met with knew not only what DACA was but how it truly worked and what it meant. When I explained I needed to graduate (within three years) I was given a very detailed plan to follow that would allow me to do that.”

“I imagine the same future that many Americans my age do,” Garcia said. “I want to graduate college and start a career in my field, or perhaps teach. I’d like to one day be the head coach at a high school. I see high school as one of the most important periods in a kid’s life, and I’d like to be there to help as many kids as I can down the right path.”

# College continues to grow faculty with new hires

The Wichita State College of Engineering faculty continues to expand in quality with the hiring of 11 new members in 2017, 27 percent of whom are women. They join an award-winning faculty who create environments where engineering students learn and conduct research side-by-side with students from different disciplines, faculty and industry.



**DR. EYLEM ASMATULU, assistant professor, Department of Mechanical Engineering**

Dr. Eylem Asmatulu is an assistant professor in the Department of Mechanical Engineering. She received her doctorate from the Department of Industrial and Manufacturing Engineering at WSU in May 2013. After completing her doctorate, she worked for two years as an engineering educator in the Department of Mechanical Engineering at WSU. Her research focuses on sustainable energy systems, life-cycle analysis, CO<sub>2</sub> capture, water treatment, recycling, composites, and nanotech manufacturing. Dr. Asmatulu teaches Recycling of Advanced Materials and Material Engineering labs.



**DR. JAYDIP DESAI, assistant professor, Department of Biomedical Engineering**

Dr. Jaydip Desai is an assistant professor in the Department of Biomedical Engineering. Desai received his doctorate in biomedical engineering with specialization in robotics and control from Mechanical Engineering at Stevens Institute of Technology. His research focuses on neuro-robotics to develop control strategies for various robotic devices through real time brain-machine interface. His research interests also include prosthetics, neural-signal processing and rehabilitation robotics. Dr. Desai teaches Introduction to Biorobotics.



**DR. SINDHU PREETHAM BURUGUPALLY, assistant professor, Department of Mechanical Engineering**

Dr. Sindhu Preetham Burugupally is an assistant professor in the Department of Mechanical Engineering. He received his doctorate from Washington State University Pullman in 2014, and his B.S. from Indian Institute of Technology in 2009, both in mechanical engineering. Between his doctorate and current position, he completed two post-docs in the Departments of Aerospace and Mechanical Engineering at University of Notre Dame and The Ohio State University respectively. His research interests lie in the fundamental physics of micro- and meso-scale devices for energy and biomedical applications.



**DR. HONGSHENG HE, assistant professor, Department of Electrical Engineering and Computer Science**

Dr. Hongsheng He is an assistant professor in the Department of Electrical Engineering and Computer Science. Dr. He received his doctorate in electrical and computer engineering from National University of Singapore. His primary research interests lie in scene understanding, machine learning and intelligent robotics. He has published over 30 journal and conference papers and holds four patents in these areas. He is an associate editor of the International Journal of Social Robotics and served on the organizing committee for several international conferences.



**DR. RÉMI A. CHOU, assistant professor,  
Department of Electrical Engineering and  
Computer Science**

Dr. Rémi A. Chou is an assistant professor in the Department of Electrical Engineering and Computer Science. Chou received his engineering degree from Supélec, Gif-sur-Yvette, France in 2011. He received his M.S. and doctorate in Electrical Engineering from Georgia Institute of Technology in 2011 and 2015, respectively. Between 2015 and 2017, he was a postdoctoral research associate at Pennsylvania State University. His current research interests include information theory, secure communication, cyber-physical security and machine learning.



**CINDI MASON, engineering educator,  
Department of Industrial, Systems, and  
Manufacturing Engineering**

Cindi Mason is an engineering educator in the Department of Industrial, Systems and Manufacturing Engineering. Cindi received her B.S. in Industrial Engineering from WSU in 2002 and her M.B.A. from Kansas Wesleyan in 2005. She has nearly 10 years of industry experience as a manufacturing supervisor, industrial engineer and project manager. She is currently working on her doctorate at WSU. Her research focus is engineering student retention including prediction modeling, retention programs and program assessment.



**DR. KONSTANTINOS MYKONIATIS, engineering  
educator, Department of Engineering Technology**

Dr. Konstantinos Mykoniatis is an engineering educator in the Department of Engineering Technology. He received his M.S. and doctorate in Modeling and Simulation at University of Central Florida and his B.S. in Industrial Engineering of Management and Production Systems at Polytechnic University of Crete. He has held a professional permit of mechanical engineering since 2010 and has been a certified scientific reviewer and presenter of Institute of Electrical and Electronics Engineers (IEEE Systems) since 2013. He teaches robotics and automation courses.



**DR. WEI WEI, assistant professor,  
Department of Mechanical Engineering**

Dr. Wei Wei is an assistant professor in the Department of Mechanical Engineering. She received her doctorate from Michigan Technological University in Department of Materials Science and Engineering. Her research interests include advanced materials synthesizing, renewable energy conversion devices, photocatalytic processes for H<sub>2</sub> generation, and mechanical properties of composite materials. During this fall semester, Dr. Wei teaches Thermodynamics.



**DR. ZHIYONG SHAN, assistant professor,  
Department of Electrical Engineering and  
Computer Science**

Dr. Zhiyong Shan is an assistant professor in the Department of Electrical Engineering and Computer Science. He was a postdoctoral researcher at University of California. He received his doctorate in 2003 from the Chinese Academy of Sciences. He had worked at Renmin University of China as an assistant/associate professor from 2003 to 2013. His research involves the areas of program analysis, software engineering, operating systems, information security and database systems. He received several research and teaching awards from the Beijing government, Chinese Academy of Sciences, University of Central Missouri and the Ministry of Education of China.



**DR. TEWODROS AKLILU ZEWDE, engineering  
educator, Department of Electrical Engineering and  
Computer Science**

Dr. Tewodros Aklilu Zewde is an engineering educator in the Department of Electrical Engineering and Computer Science. He received his doctorate in Electrical and Computer Engineering from Syracuse University in 2017. He received his B.S. in Electrical Engineering and his M.S. in Electrical Power Engineering from Bahir Dar University and Addis Ababa University, Ethiopia in 2004 and 2009, respectively. He has taught various electrical engineering courses including semiconductor devices, control systems, electrical machines, power systems, power system operation and control, and communication systems.



**ADAM SWEENEY, engineering educator,  
Department of Electrical Engineering and  
Computer Science**

Adam Sweeney is an engineering educator in the Department of Electrical Engineering and Computer Science. He received his M.S. in computer science from Wichita State University and his B.Sc. in Mechanical Engineering from Washington State University. His focus is teaching programming classes.





## Radiotherapy research to improve cancer treatment

Dr. Ehsan Salari, assistant professor of industrial, systems and manufacturing engineering, has been awarded \$243,000 from the National Science Foundation for his collaborative research: “Radiotherapy Planning for Real-Time Organ Motion Management.”

Radiotherapy is one of the most effective and commonly used modalities for cancer treatment, which uses high-energy radiation to eradicate cancer cells. However, if unaccounted for, internal organ motion during radiation delivery may lead to underdosing of cancer cells or overdosing of normal tissue. This could potentially cause treatment failure or normal-tissue toxicity.

Organ motion is of particular concern in the treatment of lung and abdominal cancers, where breathing induces large tumor displacement and organ deformation.

A recent technological innovation is a new generation of radiotherapy systems equipped with on-board magnetic resonance imaging (MRI) scanners providing a real-time high-contrast movie of the patient’s anatomy during radiation delivery.

“This offers the opportunity to devise a fundamentally new organ-motion management approach in which the radiotherapy plan actively learns and adapts to anatomical variation in real time,” Salari said.

This research will develop the methods to enable use of real-time MRI visualization to control the progress of radiation delivery in order to correct for any dose discrepancy, thus allowing treatment plans to actively adjust to anatomical changes during irradiation.

“If successful, the research will provide clinicians with real-time organ-motion management tools that have the potential to improve the accuracy and efficiency of radiation delivery in the presence of organ motion, leading to higher rates of disease control and fewer side effects for cancer patients,” he said.

The research is carried out at Wichita State’s Health Systems Engineering Laboratory in collaboration with the Department of Radiation Oncology at Massachusetts General Hospital and Washington University School of Medicine in St. Louis.



## WSU sets record in research funding

Wichita State University has experienced record increases in research funding in the past five years, with no signs of slowing down.

External funding for WSU research grew from \$56.6 million in FY 2012 to \$90.5 million in FY 2017. The goal for FY 2018 is to reach \$100 million.

A key goal of any research university is to create new knowledge, and external grant funding is critical to support those efforts, says Dennis Livesay, dean of the Graduate School and associate vice president of Research and Technology Transfer. One of the most compelling reasons an undergraduate student should attend a research university is to participate in that knowledge creation process, he said.

“WSU is a world leader in that ‘learn by doing’ aspect, as most of our research activity includes undergraduates,” Livesay said. “In this way, external funding supports our strategic goal of an applied learning or research experience for all students.”

Grants are funded by a variety of sources, including the federal government, private foundations and industry. In each case, the funder identifies areas of need, and proposals are selected based on their ability to address that need.

In the WSU College of Engineering, funders include the National Science Foundation, NASA, the U.S. Department of Energy, the U.S. Department of Agriculture, the Federal Aviation Administration and Spirit AeroSystems, among others.

## Prof Wins \$340,000 USDA Grant for Biofuel Research

Dr. Bin Li, an assistant professor of mechanical engineering, has been awarded a \$340,000 three-year grant from the U.S. Department of Agriculture’s National Institute of Food and Agriculture. The grant will fund Li’s research into the use of nanotechnology to create green energy materials from biomass.

The project is titled “Engineering Plant Proteins to Achieve Dielectric Materials with High Energy Density and High Energy Efficiency.”

Transforming renewable and low cost biomass into functional materials has been a promising solution to serious social and economic issues caused by the production, use and disposal of materials made from fossil fuels.

The proposed research aims at exploring and extending the applications of renewable and abundant natural resources, such as plant proteins, for energy storage applications involving nanotechnology. In addition to being renewable and abundant in nature, biomass possesses unique chemical and

physical structures with great potential in non-food functional applications.

“The success of this research will build a firm foundation for biomass-based sustainable energy materials,

providing solutions for growing global concerns over high energy consumption and energy waste, and will ultimately contribute to our agricultural economy and ecosystem,” Li said.



*Dr. Bin Li, an assistant professor of mechanical engineering, gives graduate student Zhuoyuan Zheng instructions in what experiment to conduct.*







# RESEARCH AWARDS HIGHLIGHTS



The **National Science Foundation** awarded **Dr. Animesh Chakravarthy**, assistant professor in both aerospace and electrical engineering and computer science, funding for research intended to allow ground and underwater autonomous vehicles (drones) to navigate in swarms without colliding with one another.



The **U.S. Department of Energy** has awarded **Dr. Shuang Gu**, assistant professor of mechanical engineering, funding for his research into use of ammonia as an alternative fuel source. Gu's research team demonstrating a method for creating ammonia from air using a hydroxide-exchange membrane powered by renewable electricity, a more efficient and lower cost method than is currently used to generate ammonia.



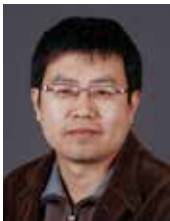
**University of Missouri** has awarded **Dr. Deepak Gupta**, associate professor of industrial engineering, funding to support the Midwest Industrial Assessment Center. The center offers manufacturers free energy use assessments by a team of engineering faculty and students, who identify opportunities to improve productivity, reduce waste and save energy.



The **U.S. Department of Energy** has awarded **Dr. Vis Madhavan**, professor of manufacturing engineering, funding to study methods of testing advance manufacturing materials under extreme conditions.



The **National Science Foundation** has awarded **Dr. Vinod Namboodiri**, associate professor of electrical engineering and computer science, funding to leverage technology to make cities more accessible and safer for people with disabilities and those who may need the extra assistance finding their way around. The funding supports a project called CityGuide, a partnership of the City of Wichita, Wichita State and Envision, a local not-for-profit serving the blind and visually impaired, which would supplement GPS with the use Bluetooth transmitters to aid navigation.



**Hitek Inc.**, has awarded **Dr. Chengzong Pang**, assistant professor of electrical engineering and computer science, funding to develop a starter generator system for a small engine aircraft.



**Spirit AeroSystems** has awarded **Dr. Michael Papadakis**, Russell Bomhoff Endowed Professor of Engineering Aerodynamics, funding for research into laminar flow, the uninterrupted flow of air over the wings, fuselage and other parts of the aircraft in flight. Poor laminar flow results in turbulence, drag and loss of lift. Papadakis' research examines the impact of small surface bumps on laminar flow.



**Spirit AeroSystems** has awarded **Dr. Suresh Raju**, associate professor of aerospace engineering, funding for research into cell distortion and node bond failures in honeycomb cores used in aircraft construction. Node failure leads to breaks where materials are bonded together.



The **Federal Aviation Administration** awarded **Dr. Kamran Rokhsaz**, professor of aerospace engineering, and **Dr. Linda Kliment**, associate professor of aerospace engineering, funding to analyze how flight loads and airframe design affect air tanker performance. This is the first phase of a three-year project supporting the United States Forest Service. The goal is to quantify the aerial fire-fighting environment in which modern heavy air tankers are flown in order to help estimate their life expectancy.



The **National Science Foundation** has awarded **Dr. Jan Twomey**, associate dean for graduate studies, research and faculty success, a grant to support her work with the national Environmental Genome Initiative. The group's goal is to create an open-source database and map of origin and development, in both time and place, of molecular building processes for the approximately 100,000 chemicals and materials used commercially to build every nearly product in current use by global society.



**Oklahoma State University** has awarded **Dr. Mehmet Bayram Yildirim**, professor of industrial, systems and manufacturing engineering, funding to support the Oklahoma State University-Wichita State University-University of Arkansas Industrial Assessment Center (IAC), which provides U.S. Industry with objective technical assistance on how to save energy, reduce costs and increase productivity.





## ALEX KANELAKOS

Three weeks after Hurricane Harvey hit Houston, temporarily closing down his workplace, NASA's Johnson Space Center, and flooding his wife's parents out of their home, Alex Kanelakos came to Wichita to represent NASA at the Engineering Career Fair and give a speech titled, "Houston, We Had a Problem."

Kanelakos received his bachelor's in aerospace engineering in 2007. In 2013, the WSU Alumni Association presented him with the Young Alumnus Award. And on Sept. 12, 2017, the Alumni Association invited him to serve as the first speaker of the Distinguished Speaker Series.

He brought a spacesuit for career fair show-and-tell, as well as his wife and children, and pointed to them to explain why he is content to stay earth-bound. He also talked about his job directing astronauts through space walks on the International Space Station, from ground control in Houston, where he started working in 2004 as a co-op student.

Kanelakos has been fascinated with space exploration his whole life, spacewalks (officially called extra-vehicular activity or EVAs) in particular, since he met the first person to do one. Alexey Leonov, a Russian cosmonaut, earned that distinction with a 12-minute EVA outside the Voskhod-2 space capsule in 1965. When he was a 6th grader, Kanelakos seized a chance to interview Leonov for a history day project, while Leonov was making public promotional appearances for a CD-ROM videogame.

"He told me he wished more people were as interested in space as a 12-year-old," recalled Kanelakos, who can be seen on video of the encounter already wearing a NASA patch on his coat.

When he was a high school student considering where to go to college, Kanelakos looked for the best opportunity to get an experiential-based education. He admits he was originally

thinking of Purdue University but chose Wichita State when he learned about its co-op programs with NASA.

Ten years since he received his degree, he now carries one of the heaviest responsibilities at NASA mission control: training space station crew members for space walks in giant swimming pools, then monitoring them when they execute the real thing in space. "It's like being a coach," he said. "I gotta make sure they can survive."

A significant challenge is the age of the space suits. NASA is using the same spacesuits used 35 years ago, with only minor upgrades. "We almost drowned a crew member," Kanelakos said, referring to the 2014 incident where astronaut Luca Parmitano's helmet started filling with water during a spacewalk. Several factors contributed to this incident including hardware contamination, lack of knowledge in failure modes and normalizing deviance.

Kanelakos believes not enough care was taken to ensure the old suits were properly maintained because they had performed well for so long. Suit updates have not occurred because of lack of political will to make the investment, he said. "From an engineering perspective, we need another suit (design) but due to financial restrictions we can't have one, so we use the suits we have."





## From music to patents, alum finds his career path

# New grad credits startup with life lessons

A month after graduating with an electrical engineering degree, Geoff Winningham took a job at Arizona-based Global Patent Solutions, a company that offers research and patent consulting to a variety of innovators.

Winningham is responsible for conducting research and writing opinions on whether he thinks a patent is likely to be granted.

“I am excited about constantly looking at new inventions and being able to learn about a wide range of technology,” said Winningham, who graduated in May 2017.

He said he never imagined his major in electrical engineering would lead him to a job working with patents. He chose his major after one of his instructors helped him build a guitar-effects pedal.

“I have played guitar since I was 10 years old,” said Winningham. “I realized that electrical engineering would give me the knowledge and ability to make a lot of fun music-related projects.”

The experience Winningham gained in college led him to this exciting career opportunity, he said. He worked as a patent and market research analyst for WSU Ventures where he researched technology being developed on campus to evaluate patent and market potential. His position allowed him to discover an interest in patents and the unique ideas of others. Winningham now writes the kinds of reports he used to evaluate at WSU Ventures.

While Winningham is excited about his responsibilities at his new job, he hopes this position will help him achieve his dreams of research and design in the music industry.

“I have always been interested in design, and I still hope to do that someday,” said Winningham. “My dream job is designing guitar amplifiers.”

When Ernie Cisneros walked across the stage at graduation last May, he opened his graduation gown to flash the T-shirt he was wearing underneath. It was not just any T-shirt, but one featuring the logo of a business he started with his brother and cousin.

Mobile Car Tune, started in August 2016, is a car servicing business where the mechanics come to you. Customers are able to request service for their vehicle by calling, texting, messaging, or by email. The customer is then connected to a mechanic who drives to the customer’s location and fixes their car.

“Our services include brakes, oil changes, struts, shocks, suspension, belts and filters,” Cisneros told the Sunflower. “It’s a pretty easy going process for the customer. We want it to be as seamless as possible.”

In the same month he received his bachelor’s degree in mechanical engineering (along with minors in business and mathematics), his business began receiving lots of attention, with stories appearing in The Sunflower, The Wichita Eagle, and on KWCH and Univision news programs. The publicity gave a boost to a business that had already made the leap from going days or weeks between calls with being flooded with demand.

Jose Cisneros came up with the idea and developed a business plan, while participating in Youth Entrepreneurs of Kansas in high school. His brother Ernie and their cousin, Jocelyn Galicia, came on, and the three began taking advantage of the resources offered to students with startups.

“The Center for Entrepreneurship has been incredibly helpful in mentoring and guiding us. We were also part of the I-Corp which helped us validate our business model,” Galicia, told the Sunflower, referring to Shocker Innovation Corps, which provides students with capital and mentoring.

Barton International Group (BIG), a student-run campus consulting firm, helped with marketing.

“They were looking to highlight local businesses and they chose us,” Galicia said. “We got to work with them to shoot a video at Ernie’s house to show them who we are and what we do. They put it all together for us.”

Mobile Car Tune also entered the WSU-sponsored Shocker New Venture Competition and came in third.

Today Mobile Car Tune continues to operate, while Ernie Cisneros has moved on to life as a flight test engineer, working for the U.S. Department of Defense outside Washington, D.C., and traveling the world as time allows.



“I am a shareholder for Mobile Car Tune now,” Ernie said. “I’m not very involved in the day to day but we still meet on occasion to discuss some things.”

Now Ernie has moved onto his next goal: to become an Air National Guard fighter pilot. (He already has his pilot’s license.) He specifically aspires to make the DC squadron, which is responsible for protecting the airspace over the capital.

Whether it’s starting a small business, getting a pilot’s license, earning an engineering degree or becoming a fighter pilot, Ernie says his strategy is the same: “You don’t have to be the smartest guy in the room—you could probably be the least bright—but if you are willing to work the hardest and make sacrifices, that is what takes you the farthest. I think it is also what people notice the most.”



*Erin Shields, WSU College of Engineering recruiter, visited Biomedical Sciences Academy in Oklahoma City, where biomedical students follow a Project Lead the Way curriculum. Students learned about the opportunities available to WSU's biomedical engineering majors.*

# Recruitment strategies drive enrollment growth

In 2017, the WSU College of Engineering set records for numbers of undergraduate students enrolled (2,241) and graduating (305). Both records are a result of five years of deliberate effort focused on recruiting future engineers and computer scientists in support of a directive by the state of Kansas passed by the Legislature in 2011 to address industry needs.

Working in collaboration with the Office of Undergraduate Admissions, the WSU College of Engineering has its own recruiters who meet with prospective students, coordinate visits to campus, and travel to high schools and community colleges throughout the region, promoting WSU's engineering programs.

Together they set aggressive goals and a strategy to support them. Currently, the goals are to have 3,000 engineering and computer science undergrads enrolled by 2022, to help meet the state's goal of an increased number of graduates. To this end, the COE is focusing on Wichita-area high schools as well as those along the I-35 corridor.

Wichita State offers market-based pricing to residents of certain counties in Oklahoma and Texas that is comparable to in-state tuition for Kansas residents. It also offers discounted pricing



*Dean Royce Bowden welcomes three dozen Kansas City-area Project Lead the Way (PLTW) teachers and administrators to a partnership reception held at Boulevard Brewing Company in Kansas City. PLTW teachers introduce children across Kansas to pre-engineering curriculum at the high school, middle school and elementary school levels.*

to Missouri residents. The university as a whole has seen a 38 percent increase in students from these areas as a result.

The College of Engineering also leverages its partnerships with 65 Kansas high schools that participate in Project Lead the Way, teaching pre-engineering courses. Wichita State oversees these programs, which use a nationally developed curriculum. In September, the College of Engineering hosted three dozen Kansas City-area PLTW teachers and administrators, at a partnership reception, to make them aware of the opportunities Wichita State offers their students.

Following visits with prospective students, the recruitment team follows up with phone calls, emails and invitations to scholarship opportunities and on-campus events, such as Dessert with the Engineering Departments, where prospective students and their parents can meet with faculty and current students. This way new students already know some friendly faces when they arrive on campus in the fall.

# COLLEGE COMMITS TO FILLING CODER PIPELINE

With job openings far out-pacing the number of qualified applicants, Kansas employers have an urgent, unmet demand for employees with computer science skills. WSU College of Engineering is working to introduce children to coding early.

For the past three years, WSU Engineering Summer Camps included camps that taught Scratch, an entry-level coding program developed by the Massachusetts Institute of Technology that allows children to create animations and games, as well as more advanced programs.

“What we quickly found was, that after just a few hours of instruction on the first day of camp, young kids were going home, going online and spending hours teaching themselves more,” said Polly Basore Wenzl, the college’s K-12 Outreach Officer.

With this in mind, the college began offering Scratch instruction to elementary school classrooms during the school year. A three-unit curriculum was developed by Zane Storlie, a junior computer science major who trained other WSU engineering students how to teach Scratch. The WSU students then visited six schools during the fall semester, each one once a week for an hour, for three consecutive weeks, reaching 150 kids. The team plans to visit another six schools during the spring semester.

The results were tremendous, with teachers reporting students exploring Scratch on their own, going home and teaching it to parents and siblings, and asking to code during recess.

“Scratch coding days have been wildly popular with our students,” said Lauree Moore, librarian at Wichita’s Adams Elementary, one

of the first schools to host the WSU program. “The students in the group are so engaged and excited about creating new projects they tell other students about it, who then want to do Scratch as well. Scratch fever is spreading through the school!”



WSU College of Engineering is also partnering with the Girls Scouts of Kansas Heartland to sponsor two Girls Who Code troops for 4th–8th graders. WSU College of Engineering is hosting the troops by providing a computer lab in the Experiential Engineering Building as well as students from our service learning class who act as volunteers to help teach girls coding. The troops use the Girls Who Code programming curriculum, and complete the Girl Scouts “Think Like a Programmer” Journey, which includes an applied-learning service project.

“We are pleased to be able to lend our support to these efforts to encourage young girls—and all children—to become coders, because the need is so obvious,” said Dr. Jan Twomey, associate dean.





# WSU sponsors robotics competitions

## IN MEMORIAM

When Andrew Skow, a WSU aeronautical engineering alum, won an aviation safety innovation competition, he decided to donate his prize money to WSU in the name of the friend and business partner who helped him develop his idea.

Pete Reynolds, who died of cancer in 2014, was an accomplished pilot and Kansas Aviation Hall of Fame inductee. In his 29-year career at Learjet and Bombardier, Reynolds flew first flights of the Learjet 24E, Learjet 28, Learjet 40, Learjet 55c, Learjet 60 and Models 31 and 31A. He also set a number of world records as a test pilot, including with Neil Armstrong, the first man to walk on the moon, in the Learjet 28-001 in 1979. They set records for time-to-climb, altitude and altitude in horizontal flight.

Before his death, Reynolds helped Skow develop the the Q-alpha Flight Energy Awareness Display, aimed at preventing airplane loss-of-control accidents. The Q-Alpha is an inch-and-a-half display that alerts pilots to conditions that could lead to hazards such as a stall, giving them advance warning. The invention was awarded the Experimental Aviation Association's Founder's Innovation Prize in 2016.

Skow received \$5,000 as a cash prize that he has given to the WSU Foundation to underwrite an endowed scholarship in Pete Reynold's name. Skow, who holds both bachelor's and master's degrees from WSU, hopes to bring the invention to market soon, with a portion of profits also underwriting the Reynolds' endowed scholarship.

"Pete was way more than a test pilot," Skow told The Wichita Eagle. "Pete was a better engineer than me. Very, very solid. The combination of my wild ideas and his experience-based pragmatism combined beautifully."

Wichita State College of Engineering continues its nearly 20-year tradition as a sponsor of robotics competitions designed to generate interest in engineering.

The 18th Annual Shocker Mindstorms competition will be held April 21, 2018 in the Heskett Center. The competition allows teams of students in grades 3-8 the opportunity to program LEGO MINDSTORMS robots to use sensors to navigate courses designed by Shocker MINDSTORMS coaches. Teams also demonstrate what they have learned to industry professionals and WSU representatives through presentations, interviews, displays and notebooks. Typically the competition draws 350 students.

For high school students, the 19th Annual Kansas BEST (Boosting Engineering, Science and Technology) robotics competition was held Oct. 14 in Koch Arena. More than 550 students in 6th-12th grades participated. The sports-like technology contest combines the excitement of a high school football game with the strategy of a chess match and the intellectual challenge of a science fair. Working from identical kits, each team had six weeks to design and build their robot.

The Kansas BEST theme in 2017 was "Crossfire" and simulated the use of robots in fire emergencies. Competitors were required to design and build a robot to rescue a fire test mannequin, contain dangerous chemicals and extinguish flames during a three-minute match. The game used a 24' x 24' field divided into three zones - the cold zone, hot zone and no-entry zone. Philadelphia Christian Academy from Park City took home the top awards and advanced to the regional competition hosted by the University of Arkansas-Fort Smith.

This year, WSU also hosted the VEX IQ Challenge in the Heskett Center on Feb. 23, where 16 teams of 3rd-6th graders competed by programming robots to complete driver-controlled and automated scoring tasks.

The new competition is being adopted due to an increasing number of schools using VEX kits in the classroom, particularly schools that have the pre-engineering Project Lead The Way curriculum supported by the College of Engineering.

*Girls in the Women in Engineering camp completed hands-on projects in the Innovation Hub of the Experiential Engineering Building. The camp was led by Samantha Corcoran with help from Tom McGuire. Girls are eligible for camp scholarships because women are underrepresented in the field of engineering.*



## Engineering camps awarded record scholarships

Nearly 300 children in grades 4-12 attended WSU Engineering Summer Camps last summer—with a record 115 receiving scholarships that allowed them to attend while paying only \$10 each. Camps typically cost \$200 to \$375 a week.

Camps are held throughout June and July each summer at three locations—Donald H. Beggs Hall, the Experiential Engineering Building and the National Center for Aviation Training. Topics include robotics, coding, applied engineering design, biomedical engineering, aerospace engineering and cybersecurity.

Scholarships worth a total of \$28,500 were awarded, thanks to private camp sponsors, which last year included Textron Aviation, Boeing, Airbus and Booz Allen Hamilton. The scholarships

primarily target children who might otherwise not get exposure to the field of engineering. All participants of the Cybersecurity Boot Camp were able to attend on scholarship, thanks to the Kansas Air National Guard 184th Intelligence Wing providing personnel and equipment to the camp at no charge.

"Our camps are essentially a tool to boost our recruitment of those who are underrepresented in the fields of science, technology, engineering and math," said Polly Basore Wenzl, camp coordinator for the College of Engineering. "Scholarships are essential to helping reach underrepresented children, which include girls, African Americans, Hispanics, and Native Americans."

This year, 40 percent of scholarships will go to first-generation college students, she said. Scholarships also boosted over-all camp participation by minorities to record levels with 10 percent Hispanic and 13 percent African American children participating.

WSU College of Engineering began hosting summer camps more than 10 years ago, beginning with what remains its most popular camp, LEGO Robotics. Originally focused on middle schoolers, the camps now offer several options for high school students, as well.

"High school camps have proven an excellent recruitment tool; about half of those who attend end up enrolling at WSU," Basore Wenzl said.

Summer camp registration and camp scholarship applications are available at [www.wichita.edu/engineeringcamps2018](http://www.wichita.edu/engineeringcamps2018)



*Members of the 184th Intelligence Wing at McConnell Airforce Base and employees of Booz Allen Hamilton assist teens in a cybersecurity competition, where each side tries to bring down the other's network. All participants attended on scholarship because sponsors are eager to recruit youth to this high-demand field.*





WICHITA STATE  
UNIVERSITY

COLLEGE OF ENGINEERING

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## WOMEN ENGINEERS FIND SUPPORT IN NUMBERS

Wichita State has 400 undergraduate women engineering students. To strengthen their academic and social experience, WSU College of Engineering created a Women in Engineering Living Learning Community (WiE LLC), where women studying engineering may live on the same floor in Shocker Hall residence hall, creating a supportive community of shared experience.

The WiE LLC provides opportunities to make friends through fun events like Clash of Colleges (shown here) as well as academic support to help students complete their degrees. Students living in the WiE LLC have increased access to tutoring services, specialized programming around topics relevant to women in engineering, as well as opportunities to interact with female faculty, staff and professionals in the engineering community.

This is just one of many WSU efforts designed to increase the recruitment, retention and graduation of women engineers. Other methods include increasing women faculty, providing female freshmen with female upperclassmen serving as mentors, supporting student organizations like the Society of Women Engineers, and offering scholarships to dozens of girls who attend our Engineering Summer Camps.