Engineering Innovator, spring 2021

ENGINEERING INNOVATOR

A PUBLICATION OF WICHITA STATE UNIVERSITY'S COLLEGE OF ENGINEERING

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SPRING 2021

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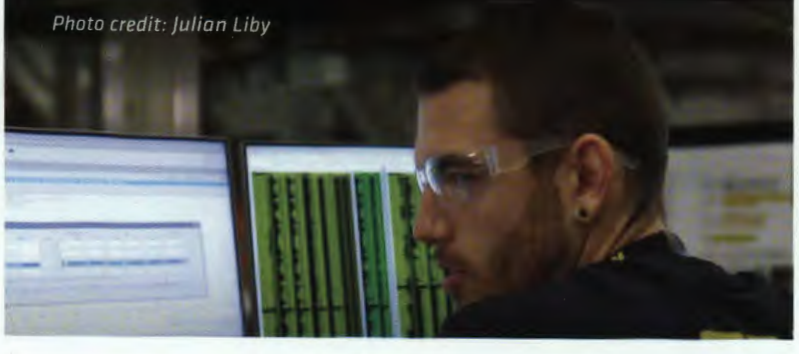
Photo credit: Julian Liby



ON THE COVER: SADIE WINTER, biomedical engineering major, was disappointed when the pandemic cancelled her plans for an overseas internship. Instead she found work on campus producing disposable stethoscopes for use by health care workers.

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DEAN'S MESSAGE

STEVEN R. SKINNER
INTERIM DEAN OF ENGINEERING

I hope this issue of the Innovator finds you safe and well. This past year presented a challenge like no other in our lifetimes – a global pandemic that fundamentally disrupted everything that we do. And yet, in retrospect, we can say we met the challenge. We adapted to remote teaching and learning and to public health and safety practices while staying connected to our students and industry partners.

Though COVID-19 travel restrictions adversely affected the attendance of our international students, attendance by domestic students remained strong. Why? Because we continued to offer the quality education that students expect.

In respect to that, I am very pleased to announce that we have realized our goal of doubling the number of students receiving bachelor's degrees from the College of Engineering over the past 10 years. This goal, initiated by an investment from the state of Kansas in engineering education, was achieved through the planning and hard work of our faculty and staff. The investment allowed us to increase our faculty, add more programs, grow our instructional spaces and create our Engineering Student Success Center. Through the generosity of our donors and partnerships with industry, we were also able to increase the number of scholarships, internships, and co-ops available to our students.

Another key accomplishment this year was the establishment of a new School of Computing within the college. This new school will elevate our computing programs and help support our local businesses in the digital transformation of our economy. In addition, Wichita State has also set new records for engineering research with $109 million in FY2019, placing us at 27th in the nation, far above any other research institutions in the state.

In this issue of the Innovator, you will find stories about these and more, examples of how even in the toughest of times, Wichita State's College of Engineering is maintaining momentum in its mission to be an essential educational and economic driver for Kansas and the greater public good.

Steven Skinner
Interim Dean

Wichita State Doubles Output of Engineering Graduates Ahead of Schedule

The aggressive goal was surpassed in May 2020 as the college awarded 380 bachelor's degrees.

The Kansas Legislature in 2011 made a commitment to invest $105 million statewide over the next decade to grow the number of engineers available to industry. For its $35 million share of that money, Wichita State's College of Engineering pledged to double the number of bachelor's degrees it awarded annually. The aggressive goal was surpassed in May 2020 as the College awarded 380 bachelor's degrees.

"This is the result of a decade of hard work," former College of Engineering Dean Dennis Livesay said when he announced the achievement last year. "Meeting our target seemed unfathomable when defined – having to more than double the number of bachelor's degrees awarded each year – but double we did!"

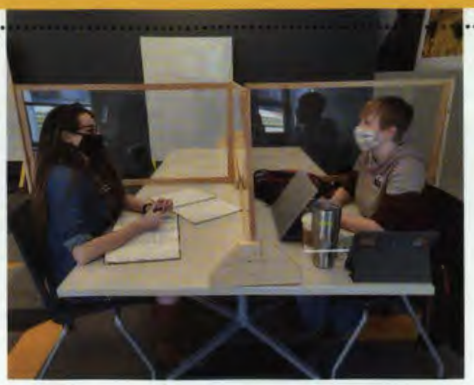
With an annual infusion of $3.5 million in state money, the College of Engineering worked aggressively toward its goal by doubling its faculty, expanding its building footprint and creating new departments, new degrees, and new programs aimed at recruiting and retaining students.

Specifically, the state covered roughly half the cost of the $32 million, 143,000-square-foot John Bardo Center, which opened in January 2017. It houses 25 teaching labs, as well as the GoCreate makerspace and industry partners Dassault Systemes and Hexagon Manufacturing Intelligence.

The state also financed the creation of the Engineering Student Success Center (ESSC), an operation unique to the College of Engineering. The center's staff conduct outreach, recruitment and retention, with a particular emphasis on attracting and retaining first-generation college students.

Once enrolled, College of Engineering students are supported by staff who supervise scholarships, mentoring, tutoring, diversity initiatives and other engagement programs designed to help students feel connected to the university and persist through graduation.

Key to increasing the number of graduates was the addition of new departments, majors and programs. The College of Engineering already had programs in aerospace engineering, computer engineering, computer science, electrical engineering, industrial engineering, manufacturing engineering, and mechanical



engineering. Since 2011, we have added biomedical engineering, applied computing, and engineering technology.

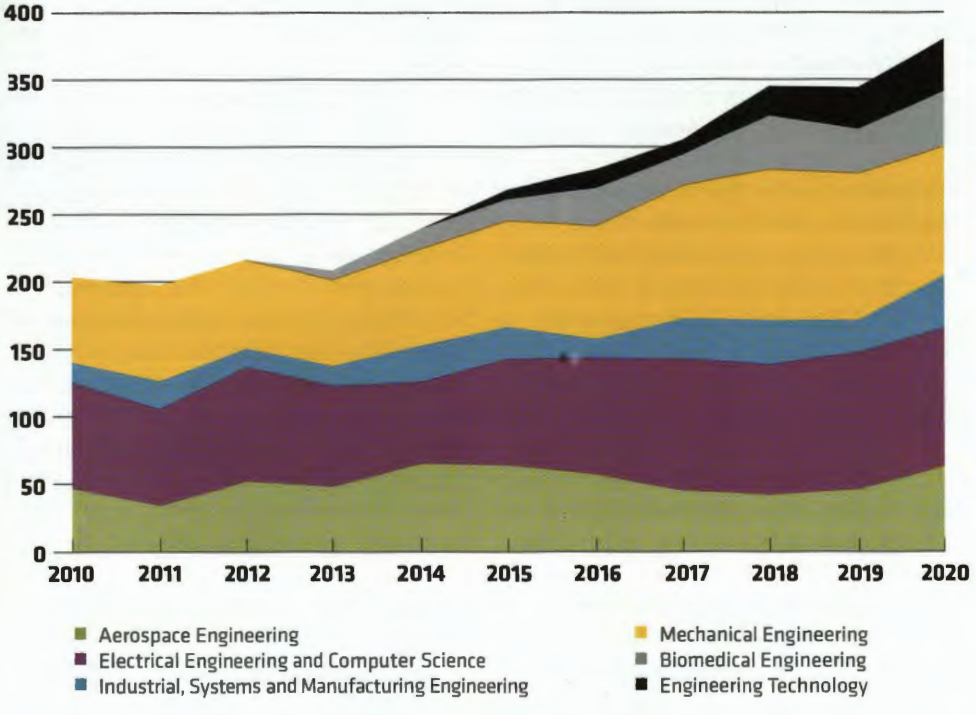
More than 200 students have earned bachelor's degrees in biomedical engineering, and the department now also offers master's and Ph.D. programs. Engineering Technology has awarded 124 bachelor's degrees in civil engineering technology, engineering technology management, facilities management, and mechatronics. The first batch of students from the applied computing program, which includes an emphasis in cybersecurity, will graduate this year.

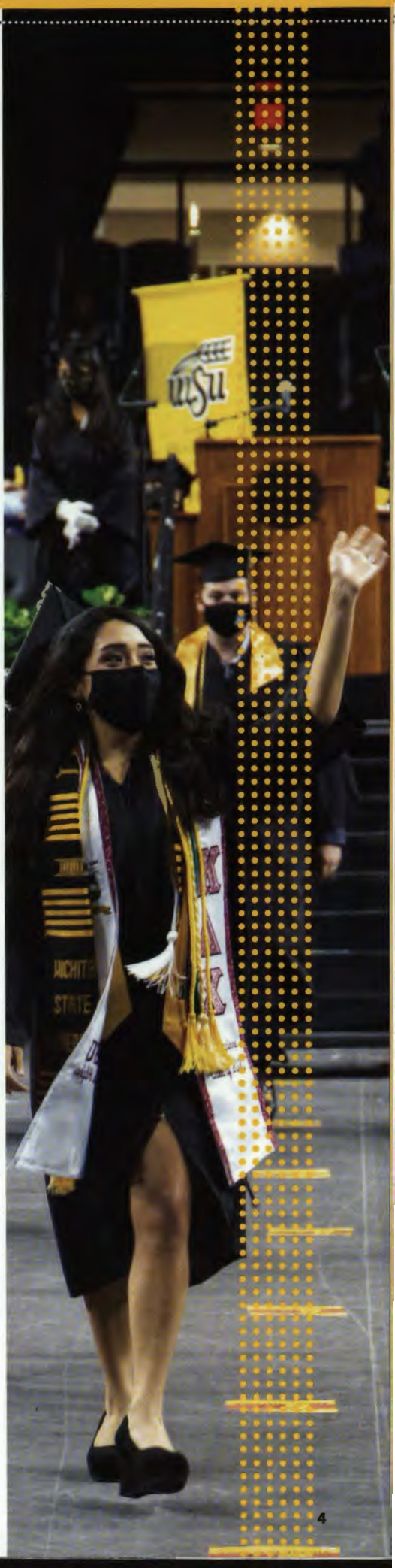
During the past decade, full-time faculty increased from about 40 to more than 80. Faculty-to-student ratios have also declined during this period.

"Everyone who played a role in this should be very proud of what we accomplished here," said Livesay, who acknowledged the contributions of his predecessors, including Dr. Zulma Toro, dean from 2005 to 2012, and Dr. Royce Bowden, dean from 2014 until his retirement in 2018.

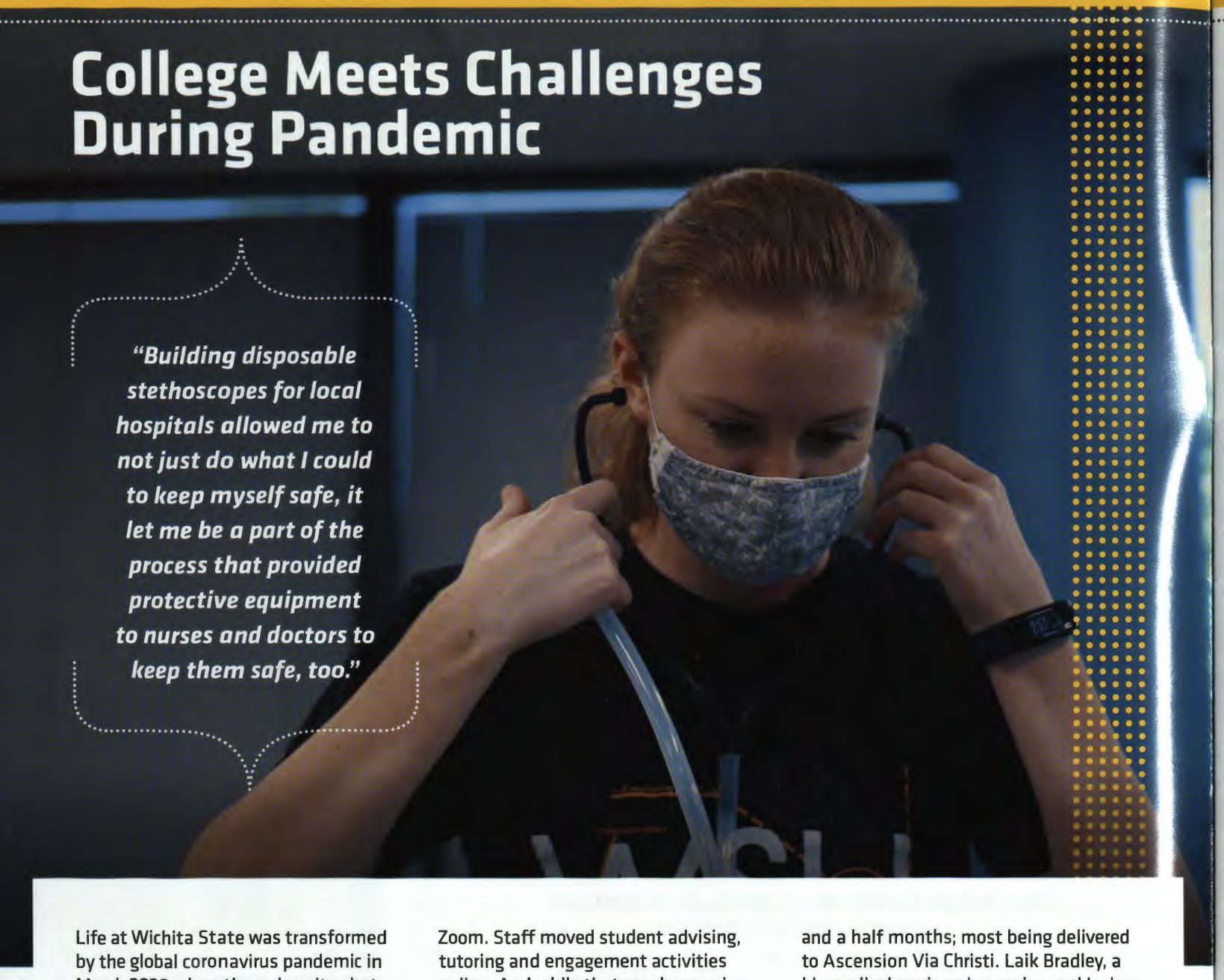
The work is not done, said Interim Dean Steven Skinner. "Even with this remarkable growth in the number of engineering and computer science graduates, there is still heavy demand from industry for new graduates coming from our college and I think opportunities for new students will remain strong well into the future," he said.

College of Engineering Bachlor's Degrees Granted by Department





College Meets Challenges During Pandemic



"Building disposable stethoscopes for local hospitals allowed me to not just do what I could to keep myself safe, it let me be a part of the process that provided protective equipment to nurses and doctors to keep them safe, too."

Life at Wichita State was transformed by the global coronavirus pandemic in March 2020 when the university shut down almost all on-campus operations. Employees who could do so began working from home. Students were sent home to complete their classes online. The move was intended to slow the spread of the virus.

All classes remained online through the summer. Fall saw a return of some in-person courses, with students now required to wear masks, but the academic calendar was changed to send all students home before Thanksgiving. They would not return until a delayed start of the spring semester in February, when remote working and learning continued.

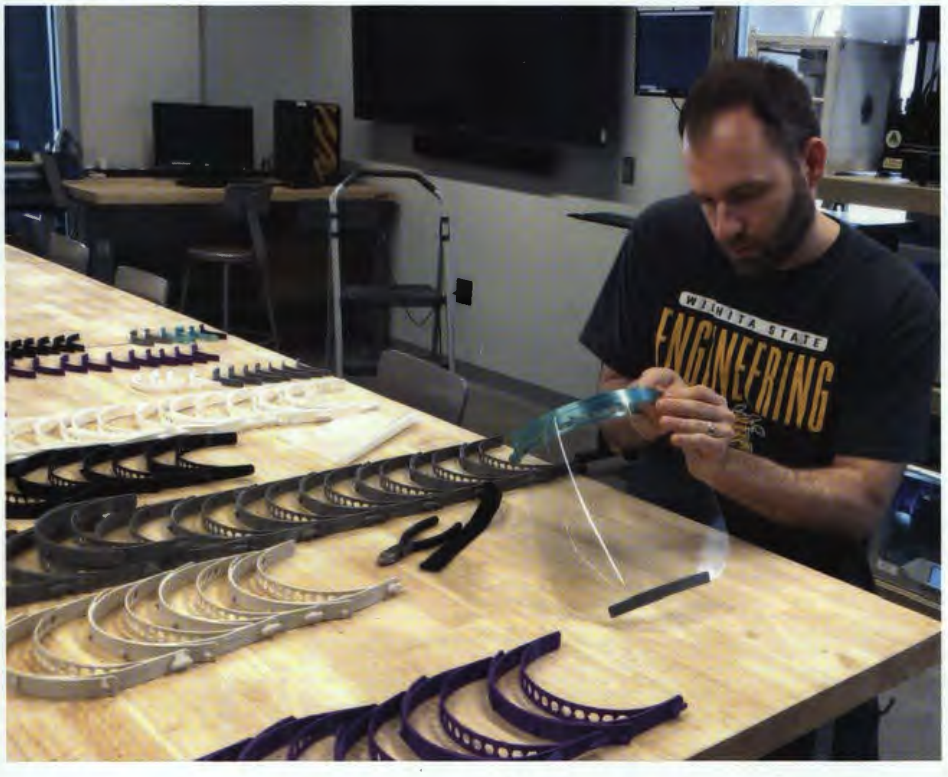
Throughout it all, the College of Engineering sought to make the best of a bad situation. Faculty learned to conduct classes using Zoom. Staff moved student advising, tutoring and engagement activities online. And while that was happening, a dedicated core group applied their engineering know-how and tools to help those fighting the virus on the frontlines.

For Nathan Smith, this meant working seven days a week from mid-March through late May, converting the Project Innovation Hub (PIH) teaching lab in the John Bardo Center into a production facility for personal protective equipment (PPE), which was in short supply nationally during the initial months of the pandemic.

Wichita Police Sgt. Teddy Wisely, a Wichita State alum, proposed the idea of 3D printing face shields to a Facebook group of Wichita 3D printing enthusiasts. Using 25 separate 3D printers including his own brought from home, Smith produced close to 3,000 units in two and a half months; most being delivered to Ascension Via Christi. Laik Bradley, a biomedical engineering major, and Joshua Stoner, a physics major, assisted.

The second project conducted over the summer involved designing and 3D printing stethoscopes. Smith and his students produced 1,800 that were also delivered to Ascension Via Christi, he said. That project received grant funding, which allowed Sadie Winter, a biomedical engineering major, to be hired on as a summer intern. Covid-19 cancelled all study abroad for Wichita State students, including Sadie's plans to go to central Asia on a medical mission internship. While the pandemic forced a change in her plans, it also provided this new opportunity.

"I really wanted to be able to serve over the summer, that had been my original plan. I wanted to honor God with how I spent



In yet another effort to engage students in addressing the pandemic, Samantha Corcoran's Service Learning (ENG 202) students, during the fall 2020 semester, met with multiple local non-profits to understand the need for face masks with clear windows for community members with hearing loss and for local speech therapists. The students set to work making prototypes, product testing safety and fit, getting customer feedback, and then manufacturing more than 60 face masks to donate.

my summer, and I am so thankful for his timing in providing the stethoscope project," she said. Winter said she felt fortunate to be able to assist those fighting COVID-19 on the frontlines by doing more than staying home.

"Building disposable stethoscopes for local hospitals allowed me to not just do what I could to keep myself safe, it let me be a part of the process that provided protective equipment to nurses and doctors to keep them safe, too," she said.

The stethoscope project started when supply chain issues created a shortage. Wichita State engineers looked for a way to produce them using 3D printers, creating a low-cost product that could be disposable, each reserved for use with one COVID-19 patient only.

"We went through 30 revisions in a matter of two weeks and in a two- to three-week timeline, we had locked in something really good," said Smith, who worked with engineers from Airbus and National Institute for Aviation Research (NIAR).

"The whole thing has just been phenomenal to watch," said David Alexander, vice president of philanthropy at Ascension Via Christi. "We've got some good engineering minds out at Wichita State."

Contributing: Paul Suellentrop of Strategic Communications

Wichita State Joins Prestigious National Institute to Boost AI

Wichita State University has been named a founding member of an AI Institute for Foundations of Machine Learning, established by a $20 million grant from the National Science Foundation.

Machine learning is the technology that allows computers to acquire knowledge and make predictions in complex environments. This technology has the potential to transform everything from transportation to entertainment to health care.

The institute is one of five that the NSF announced in August as part of a $100 million five-year national investment in the advancement of artificial intelligence research and workforce development.

"In effect, over the next five years, some of the best minds in the country will be tackling some of the grandest challenges that we face, both in terms of new AI techniques as well as breakthroughs in fields of science and engineering and sectors of our economy," said Michael Kratsios, U.S. Chief Technology Officer.

Dr. Kaushik Sinha, an associate professor in the School of Computing, will work on a team that includes researchers from the University of Texas at Austin (where the institute will be based), the University of Washington, and Microsoft Research.

Sinha was invited to join the team in its early stage of formation because of his expertise in theoretical machine learning.

"The primary focus of the AI Institute for Foundations of Machine Learning is to solve some of these fundamental questions over the next five years to ensure continued success of Machine Learning and AI over the next decade," Sinha said.

"This work will enable us to focus even more efforts on providing cutting-edge education and research-exposure to our undergraduate and graduate students," said Dr. Gergely Záruba, interim director of Wichita State's School of Computing.

Wichita State's share of the grant is $700,000 over five years, and the grant will create opportunities for students to participate in research. Graduate students will be funded from this grant and will work under the supervision of Sinha on the foundational machine learning research problems. Undergraduate students will have the opportunity to participate in theoretical or empirical research projects directed by faculty.

Wichita State's Dr. Kaushik Sinha will lead WSU's research efforts in the newly formed AI Institute for Foundations of Machine Learning, to be located at the University of Texas, Austin. Photo Credit: Annelise Muret

Researchers Exploring AI In Quantum Computing Ahead Of Their Time

Wichita State's Quantum Neural Networks Research Group meets twice weekly via Zoom.

For three decades, an interdisciplinary team at Wichita State has been exploring how machine learning – also known as artificial intelligence – can maximize the potential of quantum computing.

Quantum computing applies the understanding of quantum physics – the behavior of energy and matter at its most basic level – so that computations may be performed at unprecedented speed, solving problems of exceptional complexity that cannot be solved by conventional computers.

Led by Dr. Elizabeth Behrman, professor of physics, and Dr. James Steck, professor of aerospace engineering, the group currently has seven faculty actively involved.

Behrman, a pioneer in the field of quantum computing, said the two first met in 1990 when they were both new faculty at Wichita State.

"Twenty-five years ago, I was doing a lot of research on artificial neural networks, which are used in adaptive flight controls," said Steck, whose area of expertise is flight control systems.

Steck and Behrman began looking at the overlap of her research into quantum computing and his interest in artificial neural networks. "If you believe in reincarnation, I suppose you could say I must have been extra virtuous in my previous life as I had the good fortune to find such an excellent collaborator as Jim Steck," she said.

"Machine learning is used to train artificial neural networks, so we started applying machine learning to train quantum computers to do calculations at a time when everyone else was approaching quantum computers using the same logic gate methods used with traditional PC microprocessors," Steck said.

Learn more at ***WSU.NEWS/QUANTUM***

Wichita State Establishes School of Computing

The Kansas Board of Regents in December approved the creation of the newest department at Wichita State University's College of Engineering: the School of Computing. Former Dean Dennis Livesay called the establishment of the new school a significant marker of the university's commitment to producing the digital-skilled workforce needed by industry.

"Computing and data are ubiquitous in modern society and together are transforming every discipline," said Livesay, who led the initiative for the new school before departing in January. "In order to better prepare our students and lead in this transformation, we are integrating all of our computing academic programs and faculty. This high visibility change and the associated new degree programs prepare us to be a major player in computing and data science going forward."

In addition to its academic work, the school will support the university's planned National Institute of Research and Data Transformation (NIRDT). The NIRDT will house research and industry partnerships, bringing together faculty and students from many different Wichita State departments across the university for the sole purpose of developing a broad range of economic sectors, including the high-tech, health, manufacturing, defense and logistics.

"The goal is to align the curriculum across the university to technology that allows students more opportunities to work in fields using data such as aviation, manufacturing, health care, digital advertising, image recognition and gaming, to name a few," said Rick Muma, interim president of Wichita State.

The School of Computing will offer undergraduate degree programs in computer science and applied computing; master's degree programs in computer science, computing, and data science; and continue offering a Ph.D.

"We already have excellent programs in applied computing, cybersecurity and computer science, and they have the potential to become stronger and more relevant to industry after we bring them under the same umbrella," explained Dr. Gary Brooking, chair of the Department of Engineering Technology, where applied computing is housed currently.

The computing master's program is designed for mid-career professionals who don't have an undergraduate degree in computer science but need advanced computing skills.

"It's the cornerstone of our efforts to expand educational opportunities in computing. The program is the result of an official renaming and broadening of scope for our old computer networking master's degree. The reimagined program features stackable certificates in subfields of cybersecurity, software engineering, data science, and computer networking," said Dr. Gergely Záruba, the chair of the Department of Electrical Engineering and Computer Science and the interim director of the School of Computing.

Similarly, the new MS in Data Science is another key element in the college's efforts to support digital transformation.

"Realizing that data science is disrupting all disciplines, one of the most unique aspects of this program is that it is actually just one of three new programs being created at Wichita State," said Dr. Dukka KC, associate professor and director of data science efforts.

The others are a master's degree in mathematical foundations of data analysis, and a master's degree in business analytics, offered by the Fairmount College of Liberal Arts and Sciences and the Barton School of Business, respectively.

"This unique coordination between the College of Liberal Arts and Sciences, the Barton School of Business, and the College of Engineering ensures that Wichita State is prepared to support all aspects of data science and analytics," he said.

22 COE Students Get Research Experience as Undergrads

On a Friday afternoon in late September, almost two dozen College of Engineering students – 21 of them undergraduates – overcame a pandemic and the technical challenges of Wi-Fi connections and Zoom to take turns presenting their research findings in the John Bardo Center.

Each student gave a three-minute presentation of a literature review conducted on their chosen topic, while faculty research mentors looked on. Some students presented in person while other presented remotely via Zoom or submitted a video.

The new event was coordinated by Ana Lazarin, director of Broadening Participation and Recruitment. Lazarin said undergraduate research experiences increase the likelihood of students persisting and going on to graduate studies, particularly for students from backgrounds underrepresented in STEM (science, technology, engineering and math) fields.

"The goal is to provide these experiences early," Lazarin said. "Applied learning opportunities, including undergraduate research, have great impact in the engineering student academic experience and persistence, especially for underrepresented students." Of the 22 students who presented research, 12 were underrepresented minorities – Hispanic, Black or Native American; 14 were women.

Second-year students were the program's primary recruits. Each worked closely with an assigned faculty mentor and their research teams in labs. Students were required to participate in an introductory research workshop led by Dr. Yimesker Yihun, assistant professor of mechanical engineering.

Each student received a $4,000 stipend to support their work. Research funds were provided by both the National Science Foundation and the College of Engineering.

Participating students include Ashlyn Clark, Jennifer Alfaro, Muhammad Ahsan Anjum, Paulina Castaneda, Allen George, Julie Gonzalez-Morales, Shritha Jagadheeswaran, Ruquiya Jama, Colton Keeley, Obi Mmasi, Jaeza Robertson, Esmeralda Sanchez-Torres, Taylor Cazabat, Connor Devlin, Cameron McGinley, Katherine Moore, Gissele Mosqueda, Rupert Nunez, Duc Phan, Dang Trang, Adriana Lares and Tabitha Mullins.

Wichita State Students Receive Lucrative Cybersecurity Scholarships

When Wichita State became a designated National Center of Academic Excellence in Cyber Defense Education in November 2019, its students became qualified for one of the most lucrative scholarships offered by the university, the Department of Defense Cybersecurity Scholarship.

The first two students to receive these scholarships are Brandon Castile and Phuong (Lucy) Hoang, both seniors majoring in computer science. As recipients, they receive full tuition and fee waivers, a book allowance, and a $25,000 stipend to cover housing and food expenses. The total approximate value for an in-state undergraduate student is $37,00 per year.

In return, students must commit to one year of civilian service in a branch of the Department of Defense, working in cybersecurity.

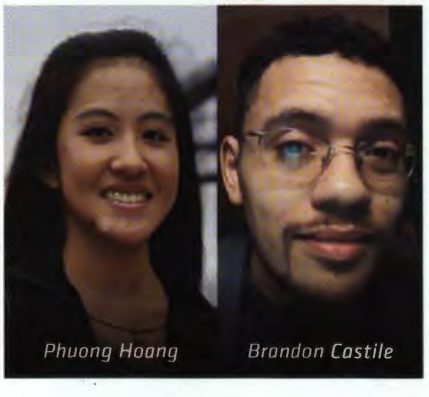
To qualify, students must be U.S. citizens in their third or fourth years of undergraduate study or first or second year of graduate study with a declared major in a cybersecurity-focused program. Students must also maintain a 3.2 or better GPA as undergraduates or 3.5 as graduate students.

Hoang said she was already interested in cybersecurity when she learned of the scholarship opportunity. "I wanted to pursue a career that has both my interests of criminal justice and computer science, so I thought cyber security was interesting," she said.

"I first got involved in cybersecurity when I joined the Wichita State University Linux User Group (WuLUG). With the organization, I was able to compete in the National Cyber League twice now (fall 2019 and spring 2020). The competition was a fun challenge that allowed me to gain the skills I'll definitely need in the future as I pursue a career in cybersecurity." The WuLUG team placed sixth in the nation in the spring 2020 Cyber Power Rankings, which rank the 300 colleges in the National Cyber League.

"Being awarded scholarships from DoD reflects the talent levels we are developing in our cybersecurity programs," said Joe Jabara, director for Wichita State's Hub for Cybersecurity Education and Awareness.

"To even be eligible for scholarships, the students must come from a school that has earned the Center for Academic Excellence designation by the National Security Agency. By achieving that, our potential to reward students for their hard work and continue to build our cybersecurity program grew exponentially."



The National Center of Academic Excellence in Cyber Defense Education designation is awarded by the National Security Agency and the Department of Homeland Security to support a federal effort to involve higher education in addressing a critical shortage of professionals with cybersecurity skills.

Professional Challenge Leads Grad Student To Success

Work at Spirit AeroSystems first brought Ramanan Sritharan to Wichita in 2014. A design engineer with Infosys Ltd., his company sent him here from India to work on an Airbus A350 center fuselage design project.

"The airframe structure in Airbus A350 is made of composite materials. I did not study about composite materials during my undergrad program, so it was a very new material for me to design a product with."

He looked to Wichita State University to see if he could learn more about composites. "For any design engineer to design a product, he/she should know the manufacturing methods of such material and mechanics behind the material," he said. Sritharan enrolled in two graduate courses: ME 672 Manufacturing of Composites and AE 753 Mechanics of Laminated Composites.

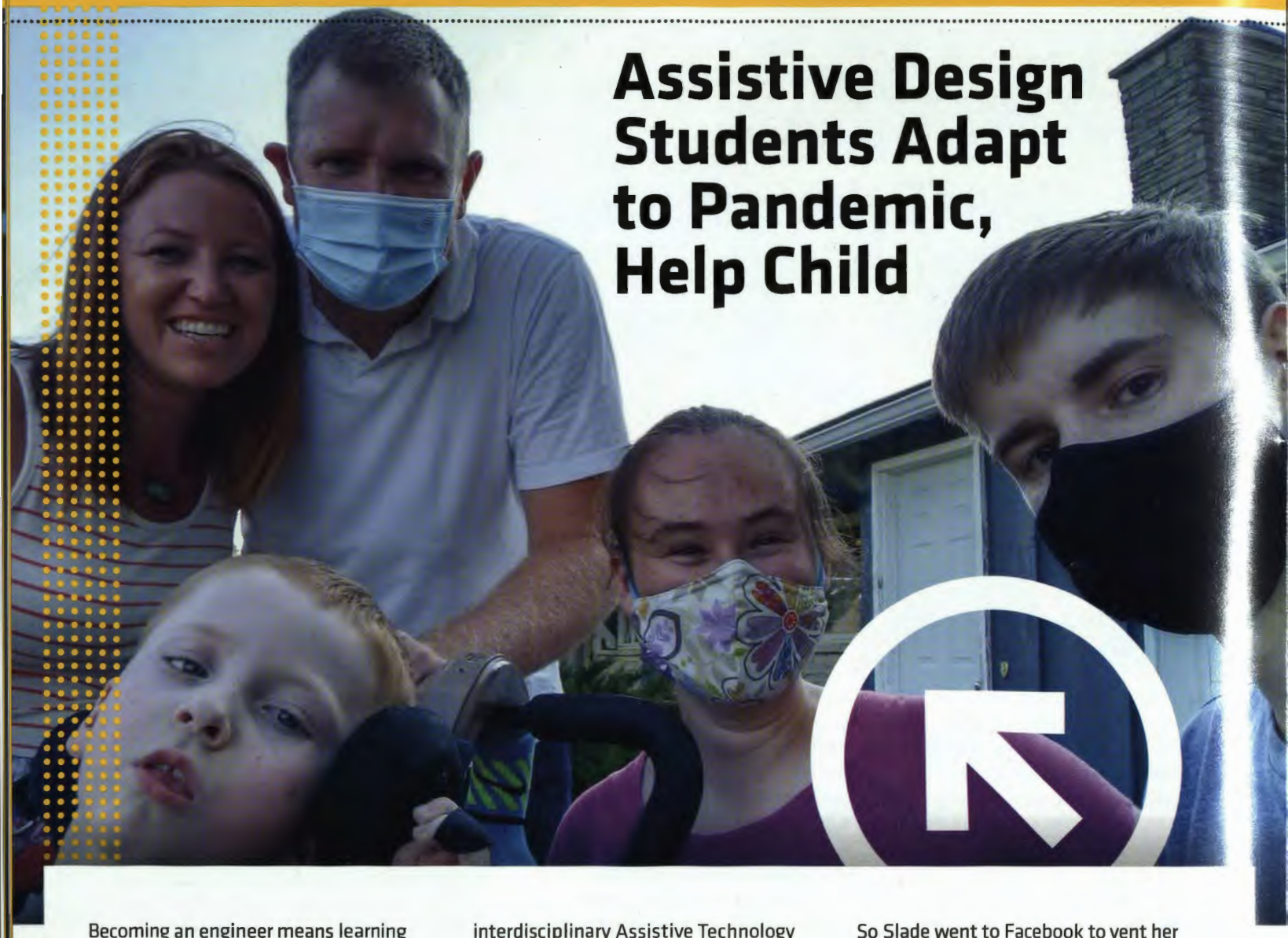
"This was a turning point in my career," he said. "After the fall 2015, I had a very good understanding of composite materials and was able to do a decent job at work."

By December 2017, Sritharan completed his master's degree, and his advisers encouraged him to pursue a Ph.D.

With almost 10 years of professional engineering experience and a purposeful research focus, Sritharan quickly distinguished himself at Wichita State and within his field.

"Ramanan is one of the most committed, reliable, helpful, presentable, and responsible graduate students in the ME department, who greatly understands and appreciates the value of higher education and applied research," said his advisor, Dr. Davood Askari, associate professor of mechanical engineering.

Assistive Design Students Adapt to Pandemic, Help Child



Becoming an engineer means learning to understand people's problems and finding ways to solve them. For Samantha Corcoran's engineering students, it means designing an all-terrain wheelchair to enable a child born with a disability to play outside with his brother and sister.

In spring 2020, Corcoran launched a new class, Assistive Design, with support from a Tilford Incentive Grant. The mission of the Tilford grant is to promote diversity by developing new diversity-related courses or modifying existing courses to enhance their diversity content.

Corcoran, who is an assistant engineering educator at Wichita State, had already taught Engineering 202, a service-learning class, where some students met children with disabilities, assessed their individual needs and then rebuilt ride-on cars to accommodate them. Modeled on that class, she created Engineering 302, an assistive design class as part of an interdisciplinary Assistive Technology and Assistive Design certificate program. Intended for students of any major, the 15-credit-hour program includes curriculum from health professions, sociology and psychology, as well as engineering.

For the inaugural class' first project, Corcoran asked students to solve the problem she saw posted by a mother on Facebook: Tiffany Slade's son, Sutton, was diagnosed with cerebral palsy at 10-months old. Sutton uses a wheelchair for his day-to-day activities, but it is not made for off-road adventures.

"We have three and a half acres of land," Slade said, "and he can't go out there comfortably."

The solution is not as easy as buying a different wheelchair. Insurance covers one wheelchair per person. With Sutton still needing his day-to-day wheelchair, the out-of-pocket cost for an all-terrain wheelchair would be around $4,000.

So Slade went to Facebook to vent her frustrations about the cost of medical equipment for people with disabilities: "It's crazy how much stuff costs."

Corcoran told Slade about her class and how they could help solve their problem.

Noah Sentry, Sunjun Park, Regan Archibald and Leah Fisher were part of a Wichita State student team in ENGR 302 that chose to use their skills to help Sutton.

Corcoran's class spent the first four weeks learning the basics: soft skills, how to manage a project, customer interviews and how to use tools in the Project Innovation Hub and GoCreate. After that, the students got to work. They consulted the Cerebral Palsy Research Foundation, which donated a custom seat and supplies. The student team met with local entrepreneur Mike Drescher, creator of the Jog Along Stroller, for design advice. Then they met with Sutton's clinical physical

therapist at Wesley Medical Center to understand his specific challenges and the best ways to support his posture.

Then the COVID-19 pandemic hit, and everyone had to take classes remotely. Three of the four students did not live in Wichita. The team no longer had access to campus resources and couldn't meet to construct the wheelchair.

But the students found workarounds. They used Zoom to discuss the wheelchair design and finish assembling. In one of their video conferences, they discussed how to attach the seat to the wheelchair with engineering lab manager Nathan Smith. Noah Sentry, who does live in Wichita, had a shop in his garage with all the tools his team needed to assemble the wheelchair. He also had the custom seat.

"We are super glad that Noah has all the pieces we need," Fisher said.

In August, after months of hard work, the team delivered the wheelchair to the Slade family.

"What they created is better than the $4,000 chair we almost bought," Sutton's mom said. The family planned to use the wheelchair to take Sutton on a hiking trip. They couldn't be more grateful for Wichita State and the student team.

"They're allowing Sutton to experience things he would never be able to do. There allowing him to go fishing with his dad and be a normal 6-year-old," Slade said.

Contributing: Andrew Martin and Matthew Ferguson, Strategic Communications marketing interns

ISME Students Learn on Job at Spirit AeroSystems

There are some lessons only learned through life experience, and a group of Wichita State industrial engineering students say they are getting exactly that at Spirit AeroSystems.

"This job has shown me that real-world problems are very messy," said Joshua Maxton, an industrial engineering senior. "The solutions are not always as ordinary or straightforward as they may be in the classroom."

Maxton is part of a group of students who began working at Spirit in March 2019, while they were sophomores, through a partnership with Spirit AeroSystems, said Dr. Krishna Krishnan, chair of the Industrial, Systems and Manufacturing Engineering Department.

Krishnan said Spirit approached him asking for a proposal to hire students to perform a productivity analysis for the company. Krishnan said ISME faculty members Dr. Deepak Gupta and Dr. Cindi Mason developed the proposal that was accepted, then worked to identify the right students.

"One of the good problems the department has is that almost all junior and senior students already had internships," Krishnan said. "Hence, most of the students that we hired at the beginning of the project were sophomores."

Assigned to assess and recommend improvements to systems and processes, the students called upon familiar skills. "We're required to use all of the curriculum and technical skills we have learned at Wichita State University," said Ridge Towner, also an ISME senior. "This includes time studies, work content, ergonomics, facilities design, operations research, production systems, statistics, databases, among others."

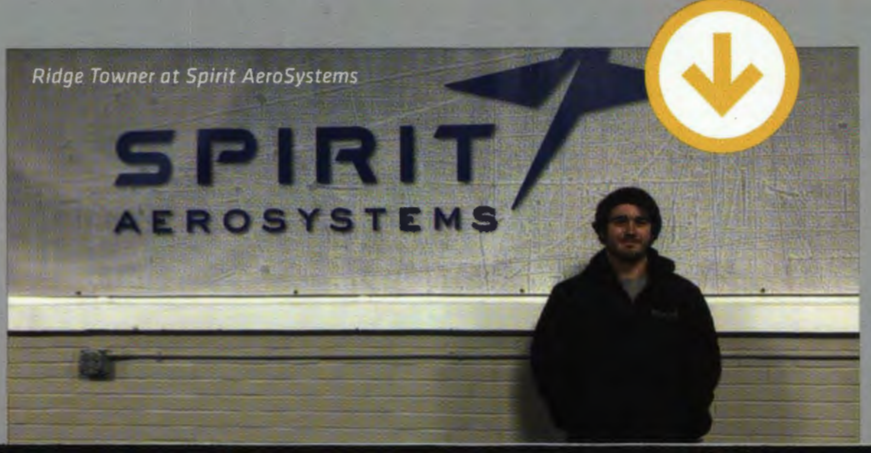
But the key lesson both said was learning how to get the right information to make those assessments.

"This job is a constant test of social skills and critical thinking," Towner said. "Most information is obtained through social interaction with shop workers, managers, machine operators, mechanical engineers, economists, ergonomists, etc. Learning how to get the essential information from many different types of people has been one of the most important lessons."

Getting the right information depends on asking the right questions and really listening to answers, they said.

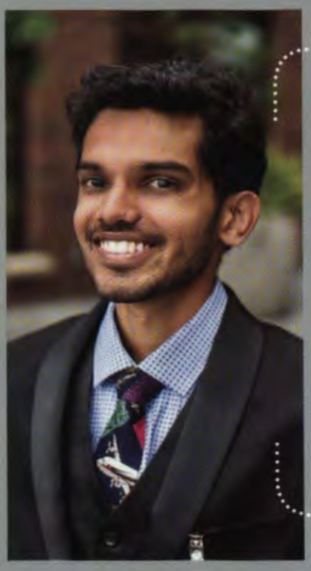
"What I mean by this is making sure that I understand the objectives of a project or job as best I can before finding a solution that is correct," Maxton said. "This job has reminded me how to listen very attentively and speak only when needed. Spirit AeroSystems has shown me much in the ways of interpersonal communication."

Krishnan said Spirit engineers provided the students excellent training and he is pleased with the result. "I have seen these students grow from sophomores to a matured 'I am an engineer' type of performance in a short period of time."



Ridge Towner at Spirit AeroSystems

Biomed Grad Student Applies Research To Analog Mars Missions



"When a crew shows that survival on Mars is possible, where everything is different and hostile, it creates an environment where endless possibilities are a thing."

Tarun Bandemegala, a graduate student in biomedical engineering, wants to be among the first astronauts to travel to Mars. He's preparing for the opportunity here on earth by participating in what are called analog missions – field tests in locations physically similar to extreme space environments.

Bandemegala has been on three such analog missions since February 2019, including one last summer in the Mojave Desert, and two previously in Vasquez Rock, California. During each mission, he participated in research intended to support and improve the health of astronauts on long-term missions to Mars.

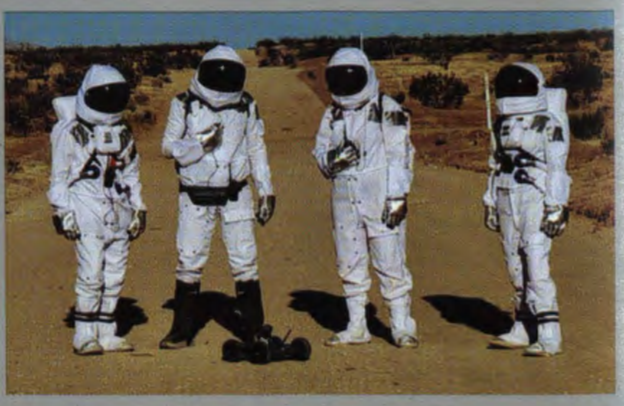
The analog missions were coordinated by Mars-Moon Astronautics Academy & Research Sciences (MMAARS), a for-profit organization that charges $2,500-$8,000 for a one- to three-week simulation training missions. Participation is competitive and scholarships are provided to those who qualify on the basis of need. Bandemegala said he received full or partial scholarships each time that he has participated. He also noted that other organizations also offer such opportunities, including NASA and Extreme Environment Mission Operations (NEEMO), Mars Desert Research Station (MDRS).

The analog missions train future astronauts interested in applying their skills in arts, sciences and technology in space. During his missions, Bandemegala worked on providing telehealth remotely in space as well as in the issue of biotech and biomedical innovations that support space travel. The crews test, develop and evaluate ways to support future human explorations and settlement on Mars and the moon. The missions also serve to inspire a future generation of space travelers.

"When a crew shows that survival on Mars is possible, where everything is different and hostile, it creates an environment where endless possibilities are a thing. Being a part of the crew that brings this hope by making it possible is why I want to go where no human has ever gone before," Bandemegala said.

The simulations are a great complement to his research at Wichita State. Under the guidance of Dr. Jaydip Desai, assistant professor of biomedical engineering and director of neuro-robotics lab, Bandemegala works on research to understand cognitive performance of the human brain in simulated space conditions, which is funded by a NASA in Kansas EPSCoR grant.

"I strongly believe that my recent work during the mission in Mojave Desert will not only support my graduate research work to evaluate brain responses in distributed weight conditions related to Earth, Mars, and the International Space Station, but also help ensure astronauts' safety and efficiency in future space missions," he said.



Convergence Sciences Research Initiative Includes Many COE Faculty

When tackling society's toughest problems, the best solutions come from people from different backgrounds working together. That's the concept behind Wichita State's **Convergence Sciences Research Initiative**.

Offering four $300,000 grants as a prize, the university challenged faculty to form teams comprised of colleagues from across the university to identify problems they would work together to solve. In addition, each team will develop new academic programs to engage undergraduate and graduate students across the university.

Faculty from the College of Engineering are well represented on all four of the winning teams:

Smart Fusion Material Research Cluster

The Smart Fusion Material Research Institute will develop new computational, material and digital manufacturing approaches to unlock the complex interactions among material, microstructure, processing and mechanical properties involved in additive manufacturing.

Dr. Gisuk Hwang, associate professor of mechanical engineering, is the principal investigator.

Dr. Saideep Nannapeni, assistant professor of industrial, systems, and manufacturing engineering is a co-PI. The team also includes faculty from the disciplines of education, mathematics, physics, fine arts and public affairs.

Data-Enabled Disaster Resilience Center

The Disaster Resilience Analytics Center will leverage the university's expertise in artificial intelligence, deep learning and multiple modes of big data to better predict natural and human-made disasters and improve preparedness by creating a new generation of digital platforms and support services.

Dr. Dukka KC, associate professor of data analytics is the principal investigator. Co-PIs include **Dr. Ajita Rattani**, assistant professor of computer science, **Dr. Kaushik Sinha**, associate professor of computer science, **Dr. Rajiv Bagai**, professor of computer science and **Dr. Atri Dutta**, associate professor of aerospace engineering. Other team members include faculty from geology, sociology, mathematics, education, accounting and library sciences.

Institute for Health Disparities

The Institute for Health Disparities will generate new methods to reduce obesity among vulnerable populations and improve health literacy as a mechanism among health care providers for behavior change.

Dr. Twyla J. Hill, professor of sociology, is the principal investigator of this all-female team. Co-PIs include **Dr. Laila Cure**, assistant professor of industrial, systems and manufacturing engineering, **Dr. Ajita Rattani**, assistant professor of computer science. **Dr. Jan Twomey**, associate dean of engineering, is a senior advisor. Other team members include faculty from public health sciences, community psychology, and nursing.

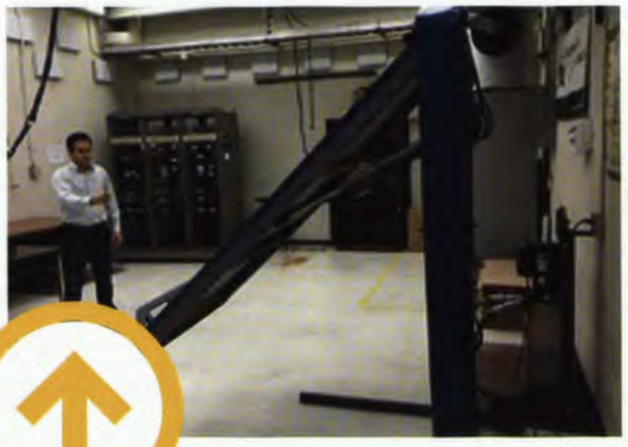
Center for Educational Technologies to Assist Refugee Learners

The Center for Educational Technologies to Assist Refugee Learners will focus on designing innovative solutions to meet the educational needs of the children of the more than 70 million forcibly displaced refugees worldwide. As a result, it will also create innovative pathways and software for educational access to those in our state and nation.

Dr. Mythili Menon, assistant professor of English and linguistics, is principal investigator. Senior personnel include **Dr. Zhiyong Shan**, assistant professor of computer science, and **Dr. Janet Twomey**, associate dean of engineering. Other team members include faculty from communication sciences, education, digital arts and journalism.

The university will invest a total of $1.2 million over a period of three years to kickstart these efforts, which are designed to be self-sustaining through federal and private research grants that will also fund student financial support – a priority of the university.

Meeting Needs of Industry Leads to New Patents for Faculty



The story of how Dr. Ali Eslami became the holder of US Patent 10,689,898 – his first – begins with a local company asking for help developing a money-saving solution.

The company, who asked to not be identified, manufactures and installs industrial lift doors. They were paying $300 to $450 to buy remotes for each door when they approached Eslami about creating an app that could instead control the doors remotely by smartphone.

"My field is wireless and mobile communications, and this project fit my expertise very well," said Eslami, an assistant professor in the Department of Electrical and Computer Engineering.

Working with colleagues Dr. Abu Asaduzzaman, associate professor of computer engineering, and Mohammad H. Erjaei, his former graduate student, Eslami developed a solution to meet the company's needs: an app combined with remote cameras, sensors and lift controls connected to Wi-Fi, which allow someone to remotely observe, open and close a commercial lift door.

"The invention provides means for enabling a user to control a large industrial and commercial door unit (of a warehouse, machine shed, barn, or airplane hangar) without using a mounted door panel or dedicated remote-control devices," Eslami explained.

"The user can monitor the door status by looking at live streaming video of the door in the mobile application. This is particularly useful for giant commercial lift doors to prevent the door from hitting and damaging objects in the door's path, i.e. cattle or expensive machinery."

Users can manage multiple doors from one app loaded on a mobile device, which also logs the history of each door's status.

Eslami worked with Wichita State's Office of Tech Transfer and Commercialization to file the paperwork to patent his team's invention. He was notified that his patent for Internet-Based Remote Control and Monitoring System for Commercial Doors Using Mobile Devices was granted on June 23, 2020.

"We have been in touch with a couple of companies for licensing the patent while it was pending. I think we have a good shot at getting a licensing deal now that it is granted," said Eslami.

"What Dr. Eslami and his team were able to accomplish for this local company goes to the heart of what we mean when we say we are an economic driver for the state of Kansas," Dennis Livesay, former dean of the College of Engineering said when the patent was announced. "We have the will and talent to provide innovative cost-saving solutions for companies, big and small."

Now, in addition to saving the local company money by eliminating the need to buy dedicated remotes, Dr. Eslami stands to make money for himself as well as Wichita State. Under university policy, faculty and the university each receive 50% of revenue generated by faculty patents.

According to Robert D. Gerlach, executive director of the Office of Tech Transfer and Commercialization, licensing revenue for the university is a modest but growing source of income. "The good news is it's a positive upward trend," Gerlach said.

Getting a patent is a significant accomplishment. Almost a dozen have been granted to College of Engineering faculty in the past three years. Those awarded patents include, but are not limited to:

- **Dr. Vinod Namboodiri** for a beacon-based indoor wayfinding system
- **Dr. Viswanathan Madhavan** for an apparatus and method for simulating machining and other forming operations
- **Dr. Shuang Gu** for a method to convert natural gas into clean liquid fuels
- **Dr. Hyuck M. Kwon** for a system and method for generating exact symbol error rates of frequency-hopped signals
- **Dr. Ramazan Asmatulu** for a composite magnetic nanoparticle drug delivery system

College Welcomes Two New Faculty

Dr. Monowar Hasan

Dr. Monowar Hasan, assistant professor of electrical engineering and computer science, starting in spring 2021. Hasan earned his Ph.D. at University of Illinois at Urbana-Champaign in December 2020. His research focus is the Internet of Things (also known as cyber-physical systems) and he will teach a new graduate-level course, Security for Real-Time Internet of Things. His industry experience includes two research internships at Toyota Motor North America.

Chris Rees

Chris Rees, assistant educator in engineering technology, started in fall 2020. Rees has a bachelor's degree in electrical engineering from the University of Natal in South Africa and more than 25 years of professional experience as an engineer, primarily in the mining industry. His expertise covers electrical engineering, mechanical engineering, mechatronics and industrial automation design. He is teaching Industrial Controls and Instrumentation, Robotics Technology, and Microcomputer Mechanical Systems Technology.

Tenure and Promotions

During April of each year, Wichita State announces which faculty have received tenure and other promotions. These are the College of Engineering faculty promotions awarded in 2020. Congratulations to these nine faculty members.

Tenure and promotion to associate professor

Dr. Atri Dutta, aerospace engineering
Dr. Shuang Gu, mechanical engineering
Dr. Ehsan Salari, industrial, systems, and manufacturing eengineering

Promotion to professor

Dr. Deepak Gupta, industrial, systems, and manufacturing engineering
Dr. Raju Keshavanarayana, aerospace engineering

Professor Incentive Review (recognition of on-going excellence)

Dr. Krishna Krishnan, industrial, systems, and manufacturing engineering
Dr. Hyuck Kwon, electrical engineering and computer science
Dr. Gamal Weheba, industrial, systems, and manufacturing engineering
Dr. Mehmet Yildirim, industrial, systems, and manufacturing engineering

Evergy Partners With Wichita State On Solar Panel Initiative

Aravinthan Visvakumar, associate professor and associate department chair, believes solar panels create a unique applied learning opportunity for Wichita State students.

Photo Credit: Matthew Ferguson

With a $150,000 investment in solar panels installed on the roof of the John Bardo Center, Evergy (formerly known as Westar) is providing both clean energy to the building and research opportunities for Wichita State students.

"We have eight different configurations of solar panels that allow us to measure different behaviors and how they affect energy production," said Dr. Visvakumar Aravinthan, associate professor of electrical engineering.

The solar initiative also includes equipment that allows Wichita State to gather and analyze data measuring solar energy production and utilization: the RTDS Novacor, state-of-the-art computer hardware with software that allows it to serve as a power system simulator. The simulator can perform real-time analysis on complex power networks with renewable resources. The College of Engineering supplemented the purchase of the RTDS Novacor by Evergy.

The solar panels and simulator are used to teach students and give them hands-on experience with industrial equipment. "We want them to be able to analyze the data and develop solutions," Visvakumar said.

For example, Wichita State researchers have already learned that power generated from the solar panels generate 2.5% of the total John Bardo Center energy demands.

Arun Kaarthick Manoharan, a Ph.D. student in Department of Electrical and Computing Engineering, is using the solar panels to develop techniques for increasing the utilization of renewable energy resources.

Currently, one of the challenges of solar energy is the variable nature of sunshine, which requires that solar energy must be stored to allow for its distribution during periods without sunshine.

"We are working on a test system that will help us determine the feasibility of secure and sustainable electricity production," Manoharan said.

How to create clean, renewable forms of energy is one of the greatest challenges facing engineers, as well as society, Visvakumar said. "We need to come together as a community and create solutions to these kinds of problems," he said.

The solar panel initiative also offers the opportunity to prepare the next generation of electrical engineers to meet the changing needs of industry. "We want to produce students who Evergy can hire," Visvakumar said. "We have been successful so far."

Contributing: Matthew Ferguson, Strategic Communications marketing intern

Dr. Rémi Chou Named NSF Career Award Winner

Dr. Rémi A. Chou, an assistant professor in the Department of Electrical Engineering and Computer Science, has been awarded a National Science Foundation CAREER Award, the most prestigious award granted by the NSF to early career researchers.

Chou's grant – worth $519,000 over five years – will support his work in bringing more robust security to wirelessly transmitted data.

"The Faculty Early Career (CAREER) Development Program grants are the most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research within the context of the mission of their organizations," according to NSF.

Chou joined Wichita State's Department of Electrical Engineering and Computer Science as an assistant professor in 2017. He teaches graduate-level courses in computer networking, information theory, and data communications. He earned his Ph.D. in electrical engineering from Georgia Institute of Technology in 2015. Between 2015 and 2017, he was a postdoctoral research associate at Pennsylvania State University.

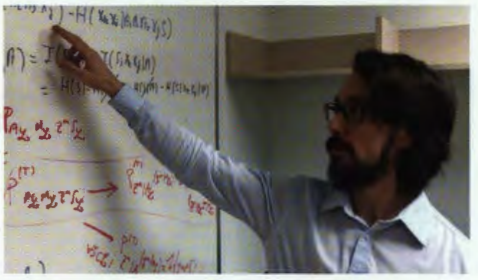
Chou proposes to build a comprehensive framework to enable the fundamental understanding and design of privacy-preserving wireless communication protocols, relying on new coding techniques from information theory, cryptography, and deep machine learning.

According to the grant abstract, "ever-growing cyber-attacks can lead to data breaches and exposure of private-user data held by third parties, including companies, government entities, or medical institutions. A possible solution to such a risk is to implement privacy-preserving protocols between users and third parties that prevent any private information disclosure in the first place."

In addition to research, the grant will provide applied learning opportunities in research for graduate, undergraduate and high school students.

Dr. Jan Twomey, College of Engineering associate dean for graduate studies, research, and faculty success, said the grant is another marker of the university's commitment to digital transformation.

"Dr. Chou's work addresses a topic of national importance – cybersecurity, and with this grant he will make important contributions to both basic research and the education of our future workforce," Twomey said.



$1.1M Grant Funds Wayfinding System

Navigating around a city or inside a building isn't always as simple as tapping on the Google Maps app. For some people with disabilities, it can be nearly impossible. Dr. Vinod Namboodiri, professor of electrical engineering and computer science, is building an infrastructure to make getting around easier.

The National Science Foundation (NSF) has awarded more than $1.1 million to Namboodiri and his team to create a community-wide wayfinding system for people with disabilities.

For most, GPS is an adequate tool to help people find their way around. But GPS doesn't give guidance inside buildings, nor does it indicate where a wheelchair entrance or elevator might be located. For people with disabilities, this is vital information.

"What this project is doing," Namboodiri said, "is trying to build a location infrastructure to provide people as they navigate, whether they are indoors or outdoors, complementing something like GPS."

The system will be twofold: First, wireless devices will need to be embedded into the environment and buildings. Those devices will then communicate to the second part of the infrastructure: a mobile app known as CityGuide that Namboodiri and his team are creating.

The team includes Dr. Nils Hakansson, associate professor of biomedical engineering, and researchers from Kansas State University, Texas A&M University, the Envision Research Institute, and the City of Wichita.

The CityGuide assistive technology system is not just for people who are visually impaired.

"Somebody with a wheelchair may approach a building from the outside and may want to know where the ramps are or where the elevator is located," he said. "That information is always useful, and it's more important for a person with a disability because it cuts down their challenges of getting around."

Story by Sara Ornelas, Strategic Communications

Dr. Vinod Namboodiri *Dr. Nils Hakansson*

An increase in funding with this latest award will allow sponsorship of more projects across the state.

With $2.8 Million Grant, Wichita State Leads NASA In Kansas

For the fourth consecutive time, the Wichita State College of Engineering's NASA in Kansas program has secured a multi-year, multi-million-dollar grant. NASA in Kansas is a consortium of universities and science museums that conduct research and outreach activity in support of NASA. The latest four-year award is for $2.8 million.

Some version of the NASA in Kansas program has existed since 1991. WSU became the lead institution in 2007. Other members of the consortium include: Emporia State University, Fort Hays State University, Haskell Indian Nations University, Kansas State University, Pittsburg State University, University of Kansas, Kansas Cosmosphere and Space Center and Exploration Place.

"Together, we favorably impact lots of students, faculty, NASA and the state of Kansas," said Dr. Scott Miller, director of the NASA in Kansas program and chair of WSU's aerospace engineering department.

The mission of NASA in Kansas is to serve as a catalyst for Kansas to lead in STEM-based education, research, industry and policy. Under this mission umbrella, NASA in Kansas sponsors internships at NASA centers, fellowships and scholarships for students, as well as workshops for teachers.

In the past two years, three WSU students interned at NASA through this program, including Lucas Webb and Kelly Shelts, who worked on rotocraft design at NASA's Ames Research Center in Mountain View, California, and Brianna Wallace, who worked at NASA Marshall Space Flight Center in Huntsville, Alabama, creating virtual reality environments to test human factors in space flight.

NASA in Kansas also sponsors NASA mission directorate projects. At WSU, this includes the Jump Start Program (JSP) and Experiential Aerospace Fellowship (EAF), programs that employ WSU engineering students in aeronautics-related research and outreach efforts.

"In the past year, JSP and EAF students have worked on NASA-relevant research on a variety of topics," said Kerry Majher, NASA in Kansas program coordinator. In addition, WSU was able to send a team to the NASA Student Launch Initiative (SLI) competition in Huntsville, Alabama, where they placed in the top 10 nationally. An increase in funding with this latest award will allow sponsorship of more projects across the state, she said.

As a Jump Start participant, student Linda Harl has been running Dr. Miller's Aerospace Projects and Prototyping Lab. During the summer 2020, she worked Dr. Atri Dutta, associate professor of aerospace engineering, doing interplanetary mission analysis and examining launch trajectories for spacecraft that travel between planets.

Since 2008, WSU has also been the lead institution for the Kansas NASA Established Program to Stimulate Competitive Research (EPSCoR) Program, which awards research grants in support of NASA's strategic objectives. In Kansas, these grants support research in the areas of health and well-being, aviation and transportation, bioscience, materials science and energy and environment. EPSCoR grants encourage partnerships with industry.

A prime example is the three-year $750,000 grant awarded to Dr. Bhisham Sharma, an assistant professor of aerospace engineering, who is leading research into a next-generation acoustic liner for aircraft engines in order to reduce impacts from aircraft noise, expanding where planes may fly. The work is being done in collaboration with ERG Materials and Aerospace Corporation, Honeywell Aerospace and Spirit AeroSystems.

Additional information about NASA in Kansas Space Grant and EPSCoR programs can be found at ***NASAINKANSAS.ORG***

Grants Roundup

A selection of grants awarded to faculty in the College of Engineering:

Dr. Vinod Namboodiri, a professor in the School of Computing, a grant from the National Science Foundation, for CityGuide, a way-finding system for people with disabilities.

Dr. Scott Miller, chair of the Department of Aerospace Engineering, a grant from NASA for artificial intelligence-assisted spacecraft trajectory optimization and planning. Science investigator is **Dr. Atri Dutta** (pictured), associate professor of Aerospace Engineering.

Dr. Scott Miller, chair of the Department of Aerospace Engineering, grants from NASA and Kansas Board of Regents for the development of next-generation acoustic liners for aircraft engine noise reduction. Science investigator is **Dr. Bhisham Sharma** (pictured), assistant professor of Aerospace Engineering.

Col. Joseph Jabara, director of the Wichita State Hub for Cybersecurity Education and Awareness, a grant from the National Security Administration for capacity building in cybersecurity education, curriculum development and student scholarships.

Dr. Kamran Rokhsaz, professor of aerospace engineering, a grant from the Federal Aviation Administration for the quantification of effect of atmospheric turbulence on ride quality and structural integrity for general aviation aircraft.

Dr. Gisuk Hwang, associate professor of mechanical engineering, a grant from the State of Kansas to establish a Smart Fusion Material Research Cluster (SFMRC), a collaboration of researchers working on a mission to advance science, technology, and policy in the areas of the computational material design and manufacturing. Hwang also received a grant from the National Science Foundation for research examining tailored flow boiling mechanisms using 3D-printed multifunctional wick structures.

Dr. Yihun Yimesker, an assistant professor of mechanical engineering, a grant from the National Science Foundation to research bio-inspired exoskeletons and safety in human-exoskeleton cooperation.

Dr. Janet Twomey, professor of industrial, systems and manufacturing engineering, a grant from the National Science Foundation to increase the representation and advancement of women and underrepresented minorities in academic STEM careers at Wichita State University.

Dr. Dukka KC, associate professor in the School of Computer, a grant from the National Science Foundation for research into deep learning-based approaches for protein-post translational modification site prediction.

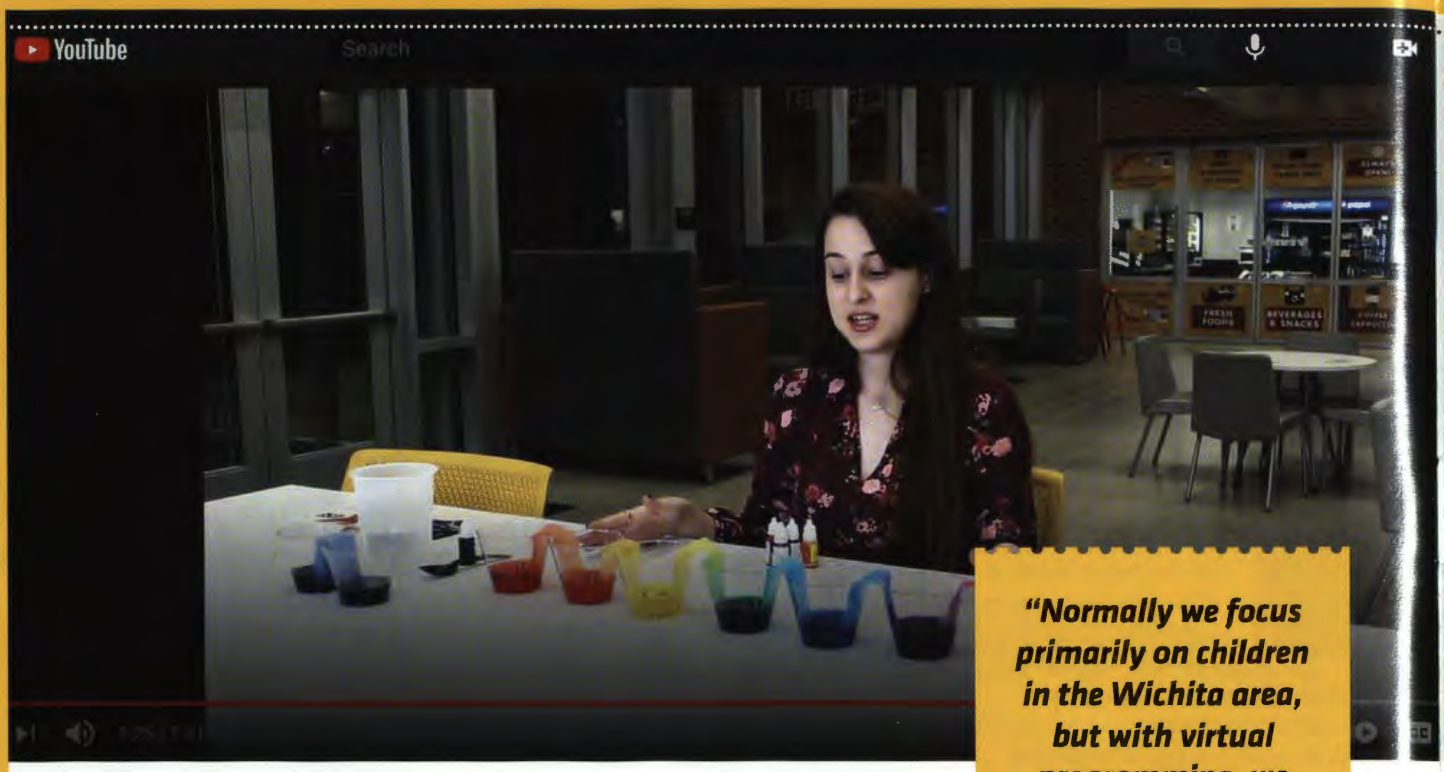
Researcher Publishes in Top Journal

Dr. Shuang Gu, an associate professor of mechanical engineering, continues to receive significant recognition for his research. With a major grant from the US Department of Energy, Gu is the lead researcher in a collaborative effort to develop new technology to more efficiently produce ammonia as an alternative fuel. He has earned research funding of $4.1 million.

Gu and his research collaborators, Dr. Stuart Licht, professor of chemistry at George Washington University, and Dr. Wenzhen Li, associate professor of chemistry at Iowa State University, had their paper, "Revealing nitrogen-containing species in commercial catalysts used for ammonia electrosynthesis," published in the October 2020 issue of Nature Catalysis, the top journal in catalysis research.

In 2019, GU received Wichita State's Excellence in Research Award, which recognizes a faculty member who has established an exemplary record of research.

According to the NH3 Fuel Association, ammonia is a proven fuel source with a 75-year safety record that works efficiently in a range of engine types, including internal combustion engines, combustion turbines and direct ammonia fuel cells, creating zero carbon emissions. Its development could reduce reliance on foreign oil and lead to new technologies and jobs.



"Normally we focus primarily on children in the Wichita area, but with virtual programming, we saw an opportunity to reach a wider audience."

Pandemic Forces New Approach to Outreach

For more than 20 years, the hallmark of Wichita State College of Engineering youth outreach programming has been hands-on, group activity. Then came the pandemic, the year of "*don't get too close to each other and try not to touch anything*."

The 20th annual Shocker MINDSTORMS robotics competition held on March 7, 2020 was the last event to be held as scheduled before cancellations began. Local schools went to remote learning, eliminating the opportunity for in-school visits and after-school programs. The university cancelled all scheduled 2020 summer camps, including the 20 camps planned by the College of Engineering.

When it became clear the threat from COVID-19 would not soon be gone, College of Engineering staff did a pandemic pivot – reimaging ways to do outreach under the new circumstances.

"We started looking at what advantages virtual outreach programming could bring – and the obvious one is making distance irrelevant," said Polly Basore Wenzl, College of Engineering outreach coordinator, who oversees a team of engineering and computer science students who present STEM activities to K-12 school children. The program is called SEEDS, an acronym for Science and Engineering Educational Development for Students.

"Normally we focus primarily on children in the Wichita area, but with virtual programming, we saw an opportunity to reach a wider audience," Wenzl said. So instead of the typical programming involving classroom visits, afterschool programs, on-campus weekend workshops, the SEEDS team hosted a new program, **Lab Tours Live!**, a series of Facebook Live tours of College of Engineering laboratories. The tours – targeted at high school students – were recorded and posted online for later viewing at **wichita.edu/labtourslive**. More than 3,000 people have viewed the tour videos, social media metrics show.

"The pandemic required us to experiment, and now we have new ways to reach broader audiences. We plan to continue even when the pandemic is over," Wenzl said.

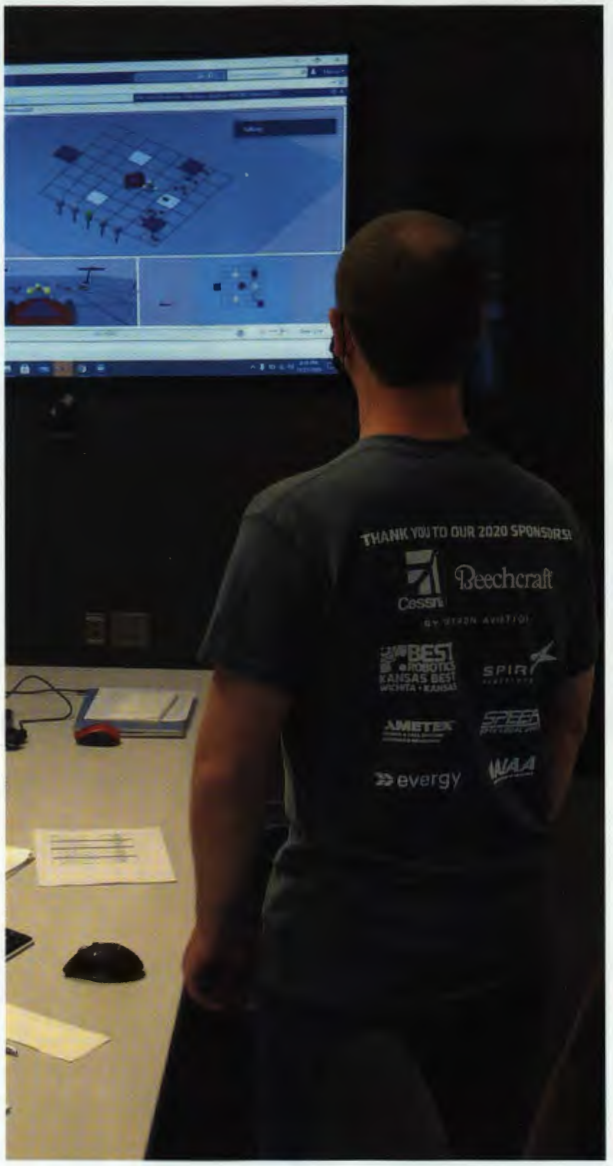
Samantha Corcoran, an engineering educator, took a similar approach with her fall 2020 Service Learning (ENGR 202) class. Normally, her students might develop hands-on STEM activities to present in person, visiting a classroom, a school science night or a Girl Scout troop. This year, they produced a series of how-to videos to guide kids through the activities remotely. Aimed at kindergarten through fifth-graders, the videos were filmed on location in the College of Engineering buildings on campus and produced by students working for Shocker Studios, an applied learning program for digital arts students. The videos can be found at **wichita.edu/STEMatHOME**.

The **KANSAS BEST ROBOTICS COMPETITION**, held annually in October, decided in August to go to an all-virtual event. The move left only a month to prepare for the event's kickoff in September. "Instead of having an auditorium full of students and coaches eager to see the new game and share the excitement for the competition, we were relegated to a Zoom call with our participants quietly listening to the updates and changes that were being presented," said Jason Bilberry, College of Engineering recruitment coordinator who oversees the event.

Ultimately, executing the competition involved 50 Zoom calls involving a dozen participating teams – down from the usual 26 to 30. (Coaches who didn't participate said the demands of remote teaching cut down on time they could invest in the event.) "Although it was vastly different than previous years, it still was a successful competition," Bilberry said.

Changes also came to this year's **21ST ANNUAL SHOCKER MINDSTORMS**, held in March. A drastically scaled-down event eliminated the notebook, presentation and interview portions of the competition, as well as traditionally scoring, reducing the number of judges and participants to reduce overall risk. Seven teams opted to compete, rather than the usual 35-40, with judges awarding one trophy to the team with the best performance on each of eight courses.

At the time of the Innovator's publication, it was unclear how the pandemic would continue to affect summer and fall outreach programming through 2021. "The only thing we can plan on is uncertainty," Wenzl said. "Until things return to normal, we will continue finding new ways to adapt."



Alumni Briefs

Kash Shaikh, who received his master's in electrical and computer engineering from Wichita State, has been named the president and chief executive officer of Virtana, a hybrid cloud optimization company. Shaikh was most recently a global vice president and general manager for enterprise infrastructure solutions at Dell Technologies. Prior to joining Dell, Shaikh held executive positions at Ruckus Wireless, Riverbed Technology and Hewlett Packard Enterprise. Earlier in his career, he held marketing and engineering leadership positions with Cisco and Nortel Networks. For the past five years, he has also served as board member of Ignited, a nonprofit that provides professional development opportunities for STEM teachers, employees, and university researchers.

Obituaries

John Byers O'Loughlin, 88, died on Sept. 8, 2020, in Wichita. O'Loughlin joined the College of Engineering faculty in 1967 as a professor of electrical and computer engineering. He served as director of the University Computing Center from 1967 to 1983. In 1984, he organized the CAD/CAM Laboratory and served as director until 2006. During that period, the laboratory gained national recognition for its CATIA education classes and textbooks. Beginning in 1999, O'Loughlin became an active lightning research investigator with the National Institute for Aviation Research, working on continued lightning protection of aircraft and systems. After 2003, his research moved to lightning protection for composite aircraft and the study of positive lightning discharges. He retired from full-time service in August 2008 but continued his research part-time until his death.

Paul Lytle, 62, died Jan. 10, 2021, due to complications from COVID-19. Lytle was a lifetime Shocker, a member of the inaugural class of Wallace Scholars, and graduated in 1981 with a bachelor's degree in mechanical engineering. He received his master's degree in engineering management in 2006. In 1989, he was hired by the university as a mechanical engineer and rose to building systems engineering in 1993 and director of environmental control in 2018. He is remembered by his Wichita State Facilities Services colleagues for his smile and can-do attitude.

Tributes

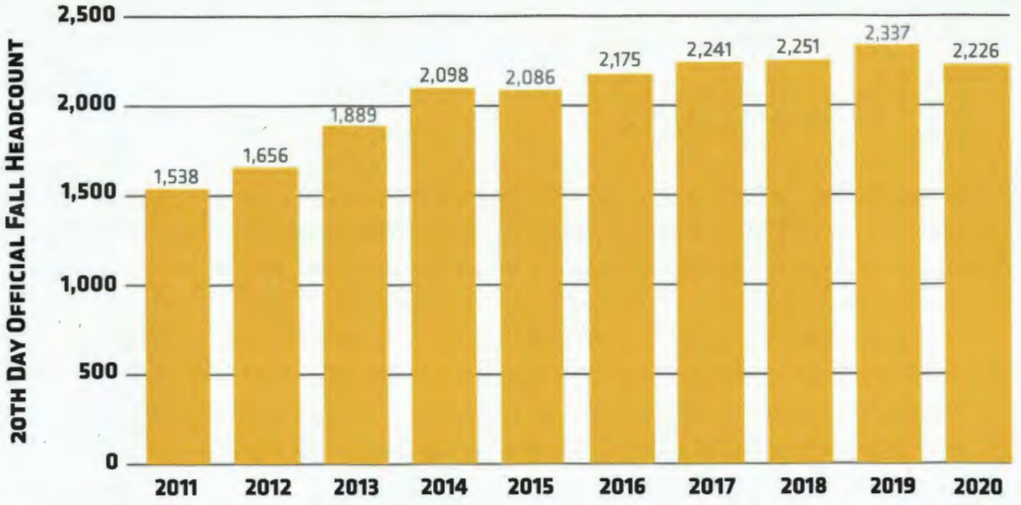
In October, Wichita State's GoBabyGo program, which modifies ride-in cars for children with disabilities, hosted its inaugural **GoBabyGo Driving Force** event in honor of the late Dr. Don Malzahn, professor emeritus of industrial engineering who devoted his career to teaching students at Wichita State University for 46 years. Malzahn died at 73 in May 2019. Malzahn's wife Phyllis donated $10,000 to GoBabyGo. "Don loved talking to the families and showing them that it is possible to be successful in life, even if you use a powerchair to get around," said Samantha Corcoran, GoBabyGo coordinator. "And he loved racing the kids down the hallways in their cars – it was so adorable." Wichita State students completed cars for three children during the event, which will be repeated in spring 2021.

"Don loved talking to the families and showing them that it is possible to be successful in life, even if you use a powerchair to get around."

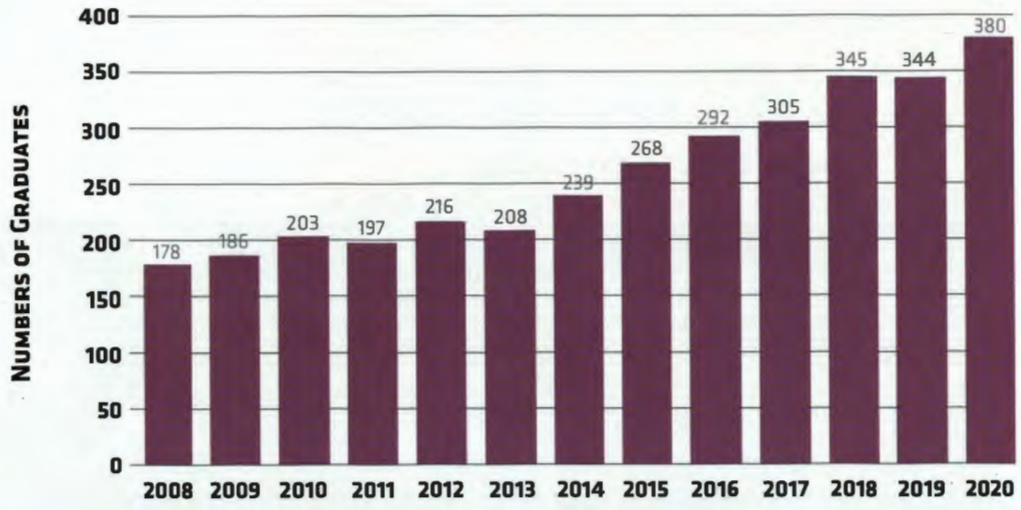
Dr. Don Malzahn smiles and encourages a child to enjoy his GoBabyGo car.

By the Numbers

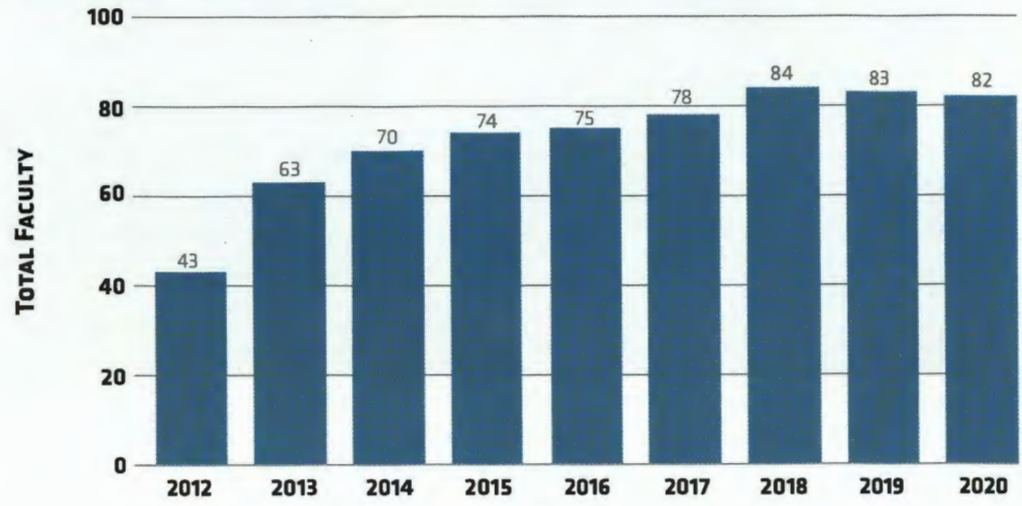
Undergraduate Enrollment



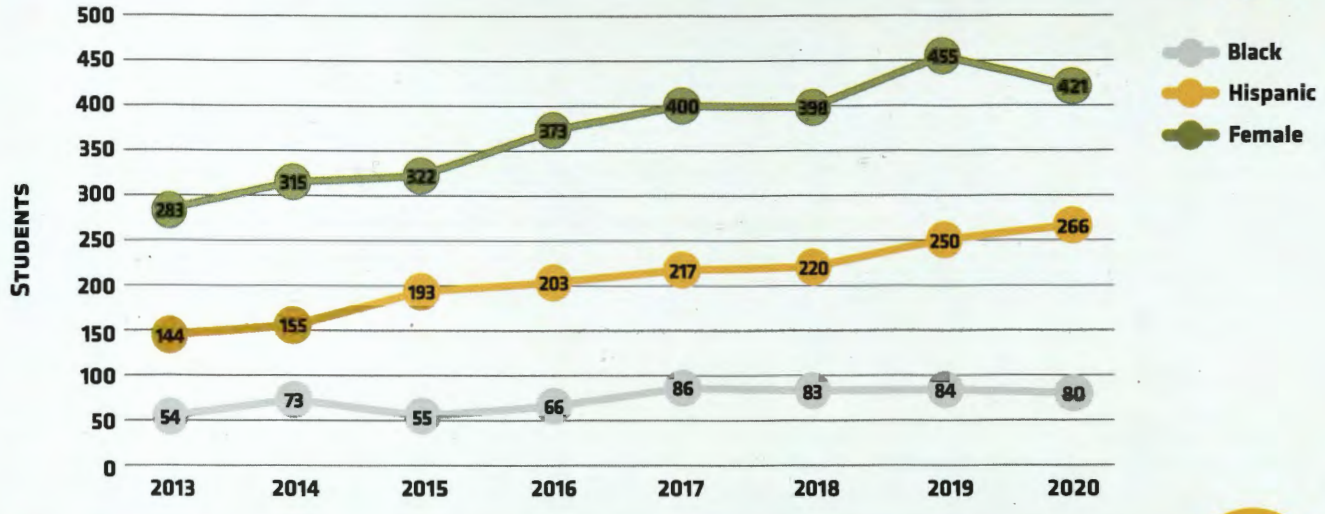
Bachelor's Degrees Awarded



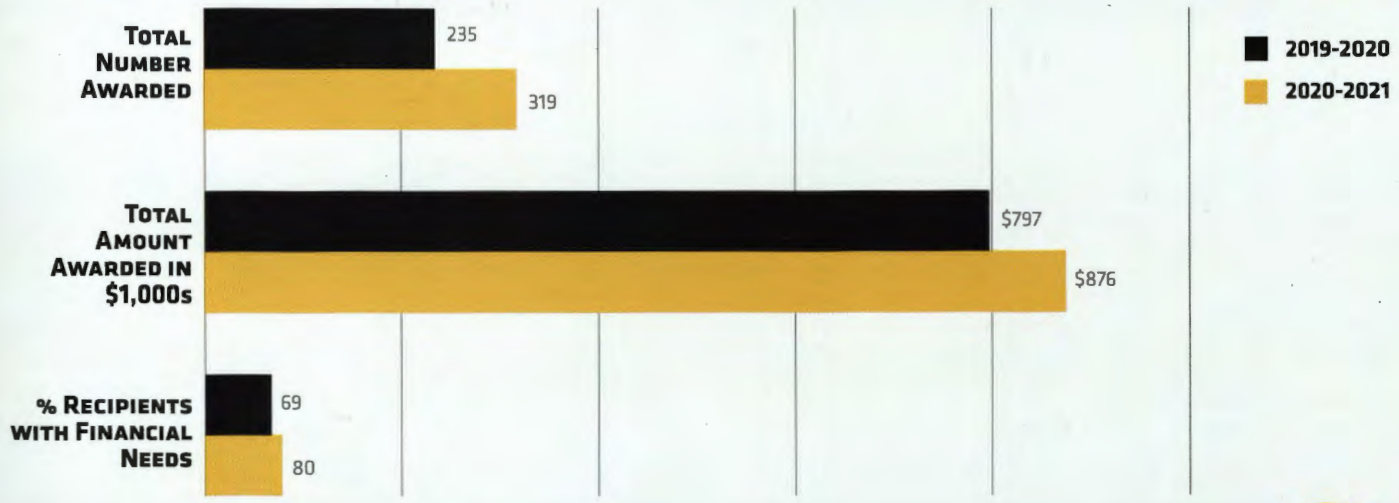
Faculty Growth



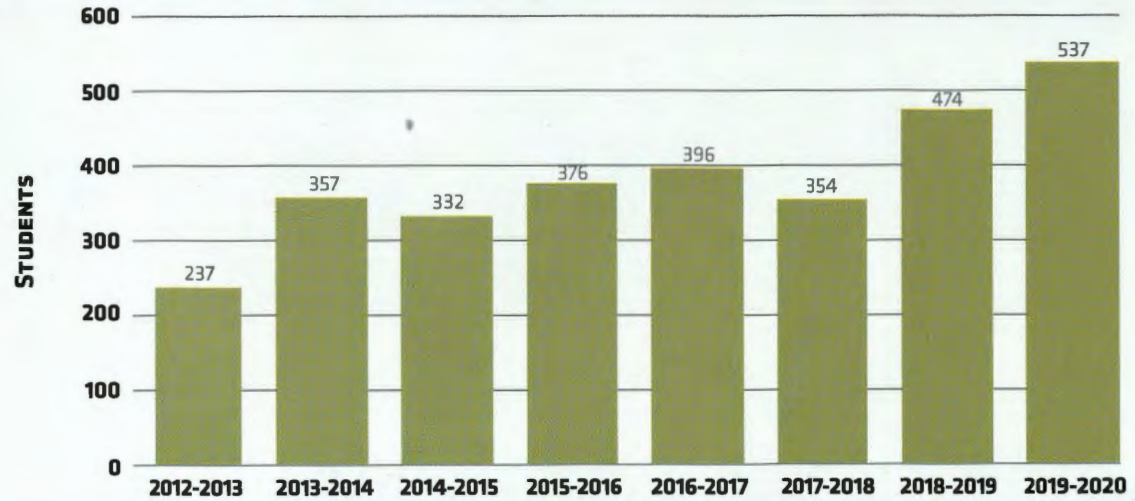
Under-Represented Undergraduate Students



College-Specific Scholarships



Students Working Co-Ops & Internships



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WE ARE THE CHAMPIONS

For the third time, the College of Engineering earned the title of Champions at the annual Clash of the Colleges. Held the first Friday of the fall semester, the event is a head-to-head competition that pits undergrad students representing each of the six academic colleges against each other. Due to limitations imposed by the pandemic, Clash of the Colleges was altered in 2020 to limit the number of students present for in-person competition and to add a number of virtual events. Each participating student received a medal. Engineering was previously named Champions in 2015 and 2016.