

3E - Engineering Excellence Edwardsville

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SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE
SCHOOL OF ENGINEERING

MESSAGE FROM THE DEAN



I am proud to report that the School of Engineering has had an outstanding year. The resiliency of our faculty, staff and students allowed our community to face the challenges brought on by the pandemic and kept the School's momentum moving forward.

We learned how to keep our operations close to normal while working in a variety of modalities and keeping a reasonable on-ground student presence. The quality of our instruction remained high and we continued to graduate well-prepared students.

As vaccination and testing rates improve, we are looking forward to the time when we can transition into our normal on-ground activities. We will reflect on the lessons learned from the last year and evaluate the possible new instruction delivery modalities that we developed in an effort to better meet our students' needs and bring our high-quality education to more students.

Despite the restrictions brought on by the pandemic:

- Our student teams called upon their creativity to participate in events under brand new conditions.
- Our faculty continued with their scholarly activities.
- Our alumni displayed innovative solutions to the obstacles they encountered.
- Industry partners continue to come forward to support our students with new scholarships and lab equipment gifts.

As our students return, they will be able to enjoy our atrium video wall, as well as improved spaces and equipment to foster student learning and collaboration. They can also look forward to the new, state-of-the-art Robotics Lab and the School's new robot dog, which should be in service this academic year.

To all of those who support our School, we are extremely grateful for your generosity. We could not be as successful in executing our mission without your support.

Anyone interested in finding out what they can do to join our efforts to meet the needs in our region and across the nation for more engineers, computer scientists and construction managers can contact Lisa Smith, director of development, at lsmitag@siue.edu.

Sincerely,

A handwritten signature in black ink that reads "Cem Karacal".

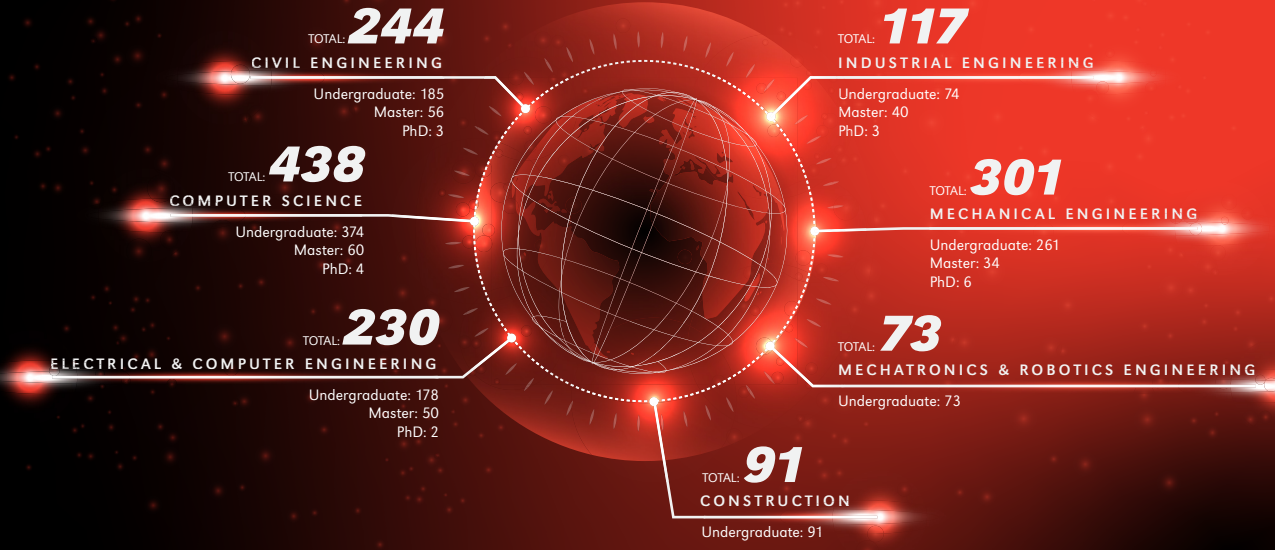
Cem Karacal, PhD
Dean

ABOUT THE SCHOOL OF ENGINEERING

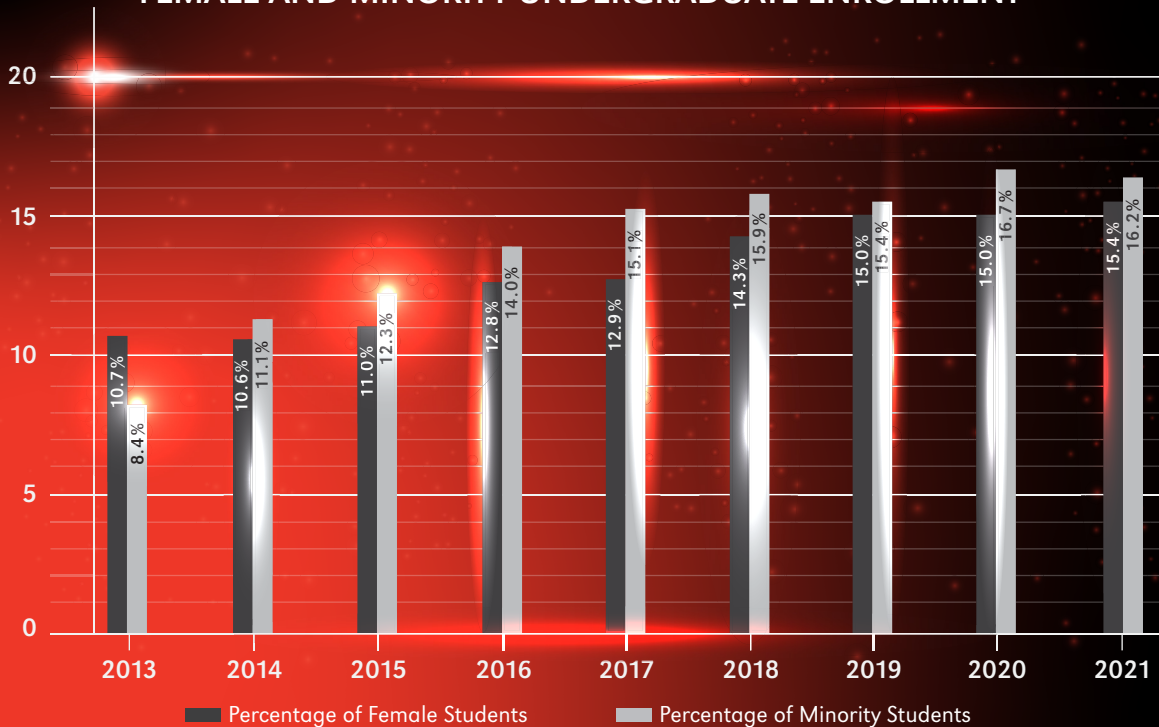
A growing reputation for outstanding programs, rising academic qualifications of applicants and a nearly 100% placement of graduates in the engineering fields are clear testimonies to the quality of engineering education at SIUE. Since 1983, the School of Engineering has prepared students to meet the growing needs in our region and nation for more engineers, computer scientists and construction managers. Fueling the prosperity of our region, the School has graduated more than 7,000 engineering professionals. More than 60% of our graduates work in the St. Louis metro area.



UNDERGRADUATE AND GRADUATE ENROLLMENT BY PROGRAM



FEMALE AND MINORITY UNDERGRADUATE ENROLLMENT



SCHOOL OF ENGINEERING SUCCESSFULLY COMPLETES VIRTUAL REACCREDITATION PROCESS



The School of Engineering is pleased to announce its engineering and computer science programs have received continued accreditation by the Accreditation Board for Engineering and Technology (ABET).

ABET accreditation provides assurance that a university program meets the quality standards of the profession for which that program prepares graduates.

The rigorous process requires years of data collection and continuous improvement based on self-assessment. The School and each program create a comprehensive self-study, which is usually followed by a campus visit from a highly trained team of experts. Due to the ongoing COVID-19 pandemic, the on-site visit was replaced with a virtual visit in January, concluding the 18-month process.

After submitting a request for evaluation in January 2020, the School submitted detailed virtual lab tours, along with virtual interviews with faculty, staff, administrators, students and advisory board members in the subsequent year. The School received notice of program accreditation after the July 2021 ABET Commission meeting.

“The School’s robotics and mechatronics (MRE) program received

initial accreditation during this process,” shared Chris Gordon, PhD, associate dean and professor in the Department of Construction. “This is a testament to the quality of the program and the significant effort to prepare for the initial accreditation process.

SCHOOL OF ENGINEERING ACCREDITATIONS

ABET Engineering Accreditation Commission

- Civil Engineering (BS)
- Computer Engineering (BS)
- Electrical Engineering (BS)
- Industrial Engineering (BS)
- Mechanical Engineering (BS)
- Mechatronics and Robotics Engineering (BS)

ABET Computing Accreditation Commission

- Computer Science (BS)

American Council for Construction Education

- Construction Management (BS)

“Accreditation is a mark of quality and continuous improvement, and a result of the care that our faculty and staff invest in maintaining an excellent educational experience for our students.”

Chris Gordon, PhD, Associate Dean and Professor, Department of Construction

MECHATRONICS AND ROBOTICS ENGINEERING PROGRAM EXPERIENCES TREMENDOUS GROWTH

In 2016, the School of Engineering premiered its mechatronics and robotics engineering program, offering students exciting opportunities to create intelligent devices by combining mechanical and electrical engineering principles. The program has expanded tremendously since its inception, experiencing a 300% growth in enrollment from 2016 to 2018.

Keqin Gu, PhD, distinguished research professor and chair of the Department of Mechanical and Mechatronics Engineering, believes this growth can be attributed to the popularity and relevance of this area in industry.

“We prepare students for the industry with a combination of knowledge in mechanical engineering, electrical engineering and computer science that represents the latest industrial trend,” Gu said. “The program is designed so that students gain analytical knowledge, hands-on experience, and the ability of engineering design in one of the most desirable engineering fields.”

The number of mechatronics and robotics engineering graduates has increased from three in the 2018-19 academic year to 18 in the 2020-21 academic year. As of fall 2020, 80 students were enrolled in the program, and faculty expect 25 graduates at the end of the current academic year.

Gu reported that program graduates are highly desirable as they enter the field in both professional jobs and graduate study.

In addition to the growing enrollment, Gu noted that the program’s laboratory equipment and space has significantly enhanced throughout the years. The School’s new Robotics Lab is currently under development, made possible by a generous donation from Enterprise Holdings Foundation.

As enrollment continues to expand, the department plans to offer courses multiple times a year, allowing students the ease of entering the program at any time or taking a semester off during their co-op experience without delaying graduation. Additionally, more electives will be added to provide students with specialized knowledge to various industry sectors.

The program received initial accreditation by Accreditation Board for Engineering and Technology (ABET) this year, which is retroactive to the program’s inception.



COUGAR BAJA TEAM PREPARES TO COMPETE



The School of Engineering’s Cougar Baja team allows students the opportunity to design and build a single-seater, off-road vehicle to compete against other colleges and universities in wheel-to-wheel racing and design competitions. The club hopes to rebuild momentum after not being able to compete last year due to the COVID-19 pandemic.

This year, the team plans on competing in the University of Louisville’s Midnight Mayhem, the world’s largest exhibition race for Baja Society of Automotive Engineers vehicles.

Although the pandemic slowed the development of the team’s current car, the group has worked diligently to adhere to race guidelines while continuing to make progress. Samuel Churchill, club president, shared that the team has recently solved many challenges by making their car lighter and faster.

“We are an enthusiastic group who will welcome anyone interested in joining no matter their skillset,” Churchill said. “This is an excellent opportunity to learn machining, welding and suspension design while applying the knowledge learned in class to a real car.

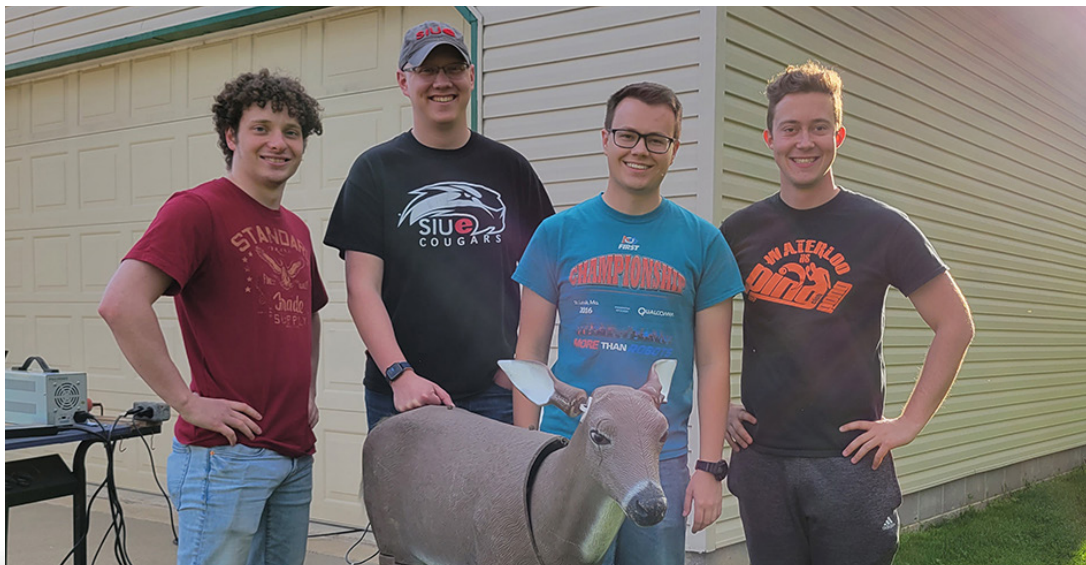
ENGINEERING STUDENTS EXCEL IN THE OTHER40 BUSINESS COMPETITION

The School of Business’ TheOther40 business plan competition offers SIUE students the opportunity to take a business idea through all stages needed to launch a product or service. Since the competition’s inception, engineering students have repeatedly earned cash prizes as finalists by applying the knowledge they’ve learned in the classroom to create innovative products.

The winner of the 11th annual competition was School of Engineering graduate Timothy Nodorf, whose team received a \$5,000 cash prize for BambAI, a remotely controlled animatronic deer decoy that mimics deer behavior.

“The winning pitch from BambAI combined an innovative idea with true market potential,” said School of Business Dean Tim Schoenecker, PhD. “We expect the prize money will help that team move its prototype closer to market. I’ll be excited to see where BambAI goes in the future.”

Engineering students have been integral to TheOther40, placing first or second in seven different competitions in the past 10 years.



SCHOOL OF ENGINEERING PAST PARTICIPANTS

Sonomu Gales LLC

Carter McCall (Finalist, 2021)

Take N Eat

Berk Ozturk (Finalist, 2019)

Mueth Produce

Dylan Mueth (1st place, 2018)

Beer Port

Cagatay Bilgin (2nd place, 2017)

Kitchen Table

Eli Ball (Finalist, 2017)

+Perception

Mert Gover, Ozan Eryilmaz, Ezgi Aras, Deniz Ersan, Mervenur Eralp (1st place, 2016)

Smarting Life

Mert Can Elkaya (Finalist, 2016)

BADA

Anilcan Akay, Alp Yetgin, Damla Gungor, Bahar Sahin (1st place, 2015)

MOREG Industries

Chico Weber (1st place, 2012)

Virtual Reality Bicycle Application Company

Brian Darrow, Cory Akers, Taylor Hook (2nd place, 2011)

COUGAR ROCKETS SOAR HIGH AMID PANDEMIC

The Cougar Rockets team enjoyed a strong showing in their first national competition, placing fourth at the 2021 Argonia Cup. The annual competition challenges collegiate teams to design, construct and execute a multi-disciplinary rocketry project through innovative engineering and technology concepts.

“Cougar Rockets is a relatively recent addition to our student organizations,” said Dean Cem Karacal, PhD. “They started with great enthusiasm a few years ago, and managed to build and launch their first-high altitude rocket in record time. The progress they’ve made in such a short time and the national ranking they have achieved speaks volumes about the caliber and dedication of the students involved in this organization.”

Although the Cougar Rockets’ first planned competition was cancelled due to COVID-19, the team remained committed and spent the next year redesigning their rocket via online meetings.

“We had worked hard, put in so much time and developed many new skills,” said former club president and computer engineering graduate William Heine. “We had to compete at the Argonia Cup to make it worth the effort.”

According to Heine, the team was in third place after launching its rocket, “Cherry Bomb.” To secure a podium spot, the students quickly reassembled the rocket to attempt a second launch, but time unfortunately ran out.

“It was sad that we couldn’t get the second launch in, but it was worth the effort,” said Heine. “Last year, our motto was Ex Cineribus Resurgemus, meaning ‘from the ashes we rise.’ This year, our motto was Dignitas Conatum, meaning ‘worth the effort.’ It speaks to the extra lengths our team members went through to continue designing and building with the added difficulty of COVID-19. The payoff of being able to compete was great.”

Cougar Rockets plans on continuing its momentum at the 2022 Argonia Cup with the goals of launching a rocket up to an altitude of over 8,000 feet and deploying a payload device that can safely fly a payload down to a ground target. Currently, team members are designing a 10-foot rocket that is five inches in diameter. The club has additionally been working on a custom-built unmanned aerial vehicle (UAV) that will autonomously fly a payload to a target.



Donations and corporate sponsorships significantly improve our ability to create and sustain programming, such as student competitions, that provide tools to future business owners and innovators. Inspire a future entrepreneur by making your gift today at:

siue.edu/give-now/engineering.

NON-TRADITIONAL ENGINEERING GRADS HARNESS DILIGENCE AND POSITIVITY TO PREVAIL



Leanne Montgomery BS Mechanical Engineering '21

“Don’t be afraid to fail.” Although this advice may sound cliché, it may just be the life lesson needed to keep someone motivated to turn their dreams into reality. Leanne Montgomery is living proof that failure does not mean an end to something. Rather, failure offers a chance to grow, reassess and strive for more.

A non-traditional student, Montgomery held a bachelor’s, master’s and doctorate in art history before heading to SIUE. She’s also a wife and mom of two. After five years of trying to forge a teaching career, she decided to pursue a career in mechanical engineering due to a lifelong interest in space.

“I thought about the things I’ve been interested in and researched growing fields,” Montgomery recalled. “In the overlap, I found mechanical engineering. I had been interested in space as a kid. I liked science a lot. The space industry, which relies on mechanical engineers, was booming in a way it hadn’t for many decades.”

That fall, she attended an open house at the School of Engineering and met Serdar Celik, PhD, professor of mechanical and mechatronics engineering, in the School’s Aerodynamics Lab. “The wind tunnel was so neat, and after talking to him about the discipline of mechanical engineering, I was confident I was on the right track.”

Currently, Montgomery has an internship working on a heat transfer project at NASA. This fall, she will begin working on her master’s in mechanical engineering through SIUE’s 3 + 2 program. Upon graduation, she will be prepared to start a permanent job in aerospace working in thermofluids.



Ollie Langhorst BS Mechanical Engineering '16

Sharing Montgomery’s success is Ollie Langhorst. Another non-traditional student, Langhorst spent six years in the U.S. Marine Corps before pursuing college for an engineering degree.

“My experience in the Marine Corps gave me the discipline, competitive nature and drive that allowed me to succeed in college,” Langhorst shared. “At SIUE, the number one skill I developed was a systematic approach to problem solving. My course-related lab work and experience as an undergraduate research assistant also provided an opportunity for me to hone my skills in written and verbal documentation and reporting.”

Currently, Langhorst serves as a project manager at Bastian Robotics in Maryland Heights, Mo. His responsibilities include reviewing active business unit project finances, reviewing and providing internal feedback on customer facing documents, leading

and participating in weekly department and project review meetings, and hiring and recruitment within his department.

Since graduation, Langhorst has made an effort to remain involved with his alma mater by attending numerous career fairs to recruit students, attending School of Engineering mentor events, and volunteering at the Career Development Center to assist with mock networking and interview events.

“SIUE is a great school,” said Langhorst. “The faculty truly care about the success of every student, and the engineering program presents tremendous value at an affordable price.”

2+2 PARTNERSHIPS: MAKING A FOUR-YEAR DEGREE ATTAINABLE

Since 2009, the School of Engineering has partnered with local community colleges to allow students to efficiently progress toward the completion of their bachelor's degree while saving money.

"2 + 2 programs provide a pathway for community college students who are planning to pursue an engineering degree," said Dean Cem Karacal, PhD. "These agreements allow a student to spend the first two years at a community college and the last two years at SIUE to earn a Bachelor of Science."

The School of Engineering's programs allow students to follow a specific curriculum while attending their first two years at a partner community college, then transfer into their intended engineering major at SIUE. This opportunity is available for students seeking a degree in civil, computer, electrical, industrial, mechanical, and mechatronics and robotics engineering.

Because SIUE offers in-state tuition to all 50 states, the School plans to build on its 2 + 2 opportunities with additional community colleges to better serve the needs of students who cannot afford a four-year college from the beginning of their studies.

SCHOOL OF ENGINEERING 2+2 PARTNERS

Kaskaskia College

Lewis and Clark
Community College

Southwest Illinois Community
College (SWIC)

Rend Lake College

Lake Land College

SCHOLARSHIP SPOTLIGHTS

The School of Engineering offers numerous scholarships to help prospective and current students ease the financial burden of affording a college education. Two of these important scholarships are highlighted here.

William H. Gentry Computer Science Scholarship

Established to provide support to students in the Department of Computer Science, the William H. Gentry Scholarship is awarded annually to a computer science student who demonstrates academic achievement and has an interest in entrepreneurship.

"This scholarship is a great opportunity for me to give back to the University in appreciation of my education," shared Hal Gentry. "I hope that it can help a student ease their financial burden and further their education."

Ralph F. Korte Scholarship Endowment For Construction Management

The Ralph F. Korte Scholarship was established to recognize Korte's 50 years of service to the Korte Company and highlight the value he places on his SIUE education. Recipients must be incoming freshmen planning on pursuing a career in construction management and have a record of leadership and service.

The Korte Scholarship provides students an opportunity to work toward obtaining a valuable degree while gaining a competitive edge in the workforce. Korte once said, "Without my education, there is no doubt that the success I have attained in the business world would in many respects be only a dream."

DID YOU KNOW?

Creating a named annual scholarship is easier than you may think. Help a student focus more on being engaged in learning and less on paying tuition. With a minimum pledge of \$500 per year for five years, you can create a scholarship named in honor of your profession or one of your mentors, or in memory of a loved one. Your gift will also inspire future generations of engineers to pay it forward.

Please contact Lisa Smith, director of development, at lsmitag@siue.edu for more information.

As cost is among the top three factors when choosing a university, scholarships play an important role in recruiting high-caliber students. Engineering specific scholarships are 100% supported by friends and alumni. Please consider making a gift to our general scholarship fund today at:

siue.edu/give-now/sog.

ROBOT DOG PROVIDES INNOVATIVE HANDS-ON EXPERIENCE ACROSS DISCIPLINES

The School of Engineering is pleased to introduce Spot, an agile mobile robotic dog and the latest addition to the growing portfolio of innovative technology available to faculty and students. Spot, developed by Boston Dynamics, will allow students endless opportunities to develop novel applications and gain first-hand experience controlling a state-of-the-art robot.

“Narayan Bodapati, former chair of the Department of Construction, suggested that the robot dog would be an excellent platform for the School,” said Chris Gordon, PhD, associate dean and professor in the Department of Construction. “This technology will assist in keeping our students and faculty at the leading edge and provides a robust platform for students to develop innovative sensing and robotic solutions.”

Through autonomous missions, Spot can navigate rough terrain with unprecedented mobility, allowing students to automate routine inspection tasks and capture data safely, accurately and frequently. The robot dog has been used by various organizations to monitor construction sites; provide remote inspection at gas, oil and power plants; and assist in public safety.

“The robot has applications across the School of Engineering,” explained Gordon. “Through its application programming interface, students can learn to access sensor information and develop applications to control Spot. The robot also supports various data collection payloads, such as cameras and laser scanners, so students can gain experience conducting data collection missions for construction site monitoring or infrastructure inspection.”

Bodapati, PhD, emeritus professor and former chair of the Department of Construction, is the project’s primary donor. His generous gift was then matched by industry friends and sponsors DyoCense, Nidec Motor Corporation, Emerson and Wood River Refinery-Phillips 66. Since retirement, Bodapati has remained heavily involved with the School and donated toward multiple new initiatives.

“A few months back, I was watching the CBS News *60 Minutes* segment on Boston Dynamics’ robot dog, which I found very interesting and exciting,” shared Bodapati. “This seemed to be a valuable addition to the School’s toolkit, specifically in advancing programs like mechatronics and robotics engineering. After discussing the project with Dr. Gordon, I made a donation to kick-start the project and help raise the remaining funds.”

Bodapati believes the robotic dog will provide a platform for research and teach different disciplines within the School while serving as a way to publicize SIUE’s presence and attract prospective engineering students.



The addition of the robotic dog has generated quite a bit of enthusiasm across the School of Engineering. I am optimistic that Spot will inspire our students to develop many interdisciplinary innovations going forward.

Chris Gordon, PhD, Associate Dean and Professor, Department of Construction

ROBOTICS LAB UNDER CONSTRUCTION THROUGH ENTERPRISE GIFT

Thanks to a generous \$1.5 million donation from the Enterprise Holdings Foundation, the School of Engineering is currently developing a state-of-the-art robotics lab to provide engineering students of all disciplines with experiences in industrial and autonomous robot applications. The lab is currently in the design phase with construction set to begin this fall.

The lab will offer students the opportunity to interact with leading-edge robotics technology. Although the lab will primarily be used for teaching, master's and doctoral students will also be able to conduct graduate research in the facility.

“We hope this lab will facilitate cross-disciplinary interactions and collaborations on robotics-related topics among students and faculty of different programs within the School,” said Dean Cem Karacal, PhD. “Students will be able to design and implement a variety of robotics applications using the latest robotics technology.”

The lab's equipment will include Fanuc and Universal Robot cells, as well as a Viper robot arm for industrial applications. Additionally, a variety of autonomous robot teaching and research platforms will be available, including

Quanser, Turtlebot, F1 NET and Nao. Robots will be controlled through a set of high-performance computers and supporting lab equipment such as sensors, actuators, microprocessors, power supplies, oscilloscopes and function generators.

Located in the School's atrium, the lab will also feature an area for testing small drones. The renovated space will have windows in the corners, allowing visitors to the School to see inside the lab without disturbing activities.

“We hope to showcase the new lab to get prospective students excited about robotics and automation, and consider pursuing a career in these rewarding fields of engineering studies,” added Karacal.

As technology is becoming an integral part of our daily lives, the ideas and projects that come from this lab will help us produce entrepreneurs and technology leaders who may end up shaping the future of our civilization.

Cem Karacal, PhD, Dean of the School of Engineering



Exposing all of our students to this interdisciplinary technology gives them a distinct advantage when solving real-world automation problems. When you support our new robotics lab you are ensuring our students are well prepared and stand shoulder-to-shoulder with their peers on this new frontier.

Give today at siue.edu/give-now/robotics.

DENN PARTNERS WITH DEPARTMENT OF DEFENSE IN \$3M SPACE INITIATIVE

The Department of Defense (DoD) has awarded more than \$31 million in funding through its National Defense Education Program (NDEP) to support 12 initiatives nationwide aimed at establishing or expanding STEM education, outreach and workforce initiatives for students and educators from early childhood through postsecondary.

Among the awards was \$3 million to the University of Illinois at Urbana-Champaign (UIUC) for the three-year, multi-institutional collaborative: Expanding the Pipeline and Enhancing Education of Students Pursuing Careers in Space.

SIUE has joined UIUC as an institutional partner on the project and will manage a \$900,000 subaward under the direction of Principal Investigator (PI) of Record and Senior Scientist Jeffrey Sabby, PhD, associate professor in the College of Arts and Sciences' Department of Physics. The School of Engineering's Michael Denn, PhD, instructor in the Department of Mechanical and Mechatronics Engineering, is a co-PI of SIUE's subaward.

In the award proposal, project developers cited that "space is increasingly globally competitive," with China emerging as a leading player. They emphasized the need for the DoD to "grow and enhance its own space workforce and cultivate a strong commercial industry of space contractors and collaborators."

In response to a "dearth in this workforce," this project wishes to expand the pipeline and enhance the education of students pursuing careers in space. It involves the creation of an integrated set of educational resources focused on space, and the strategic implementation of these resources in undergraduate classrooms and K-12 classrooms, as well as at outreach events, teacher training events and workshops.

For the past several months, Denn has been working with SIUE students to develop hands-on STEM kits with rocket, rover, submarine and JetBot themes.

In August, Denn and students demonstrated their single-stage rocket kit to students attending STEMKAMP at Mascoutah High School. Around 200 people viewed the demonstration, which was designed for grades 3-8 to learn more about STEM-related topics. Following the launches, the team conducted an indoor display of their kits and hosted a Q&A session for students and parents.

"This project benefits SIUE in many ways, including establishing a working relationship with the DoD, UIUC and NIU, which could lead to future collaborations," said Denn. "Additionally, SIUE is gaining valuable experience and expertise in using multi-disciplinary teams to develop low-cost STEM kits, which can also be used as demonstration articles and projects in engineering classes."

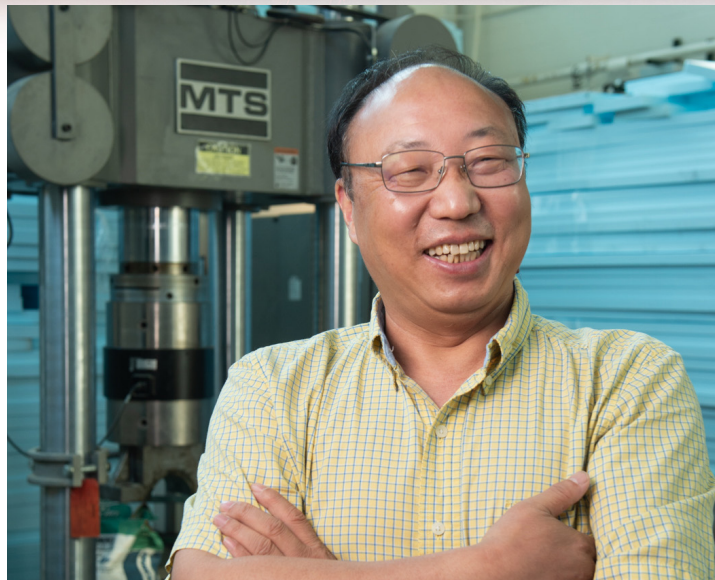


RECENT SABBATICALS

Bifurcation and Stability in Nonlinear Dynamical Systems

**Albert Luo, PhD, Distinguished Research Professor,
Department of Mechanical and Mechatronics Engineering**

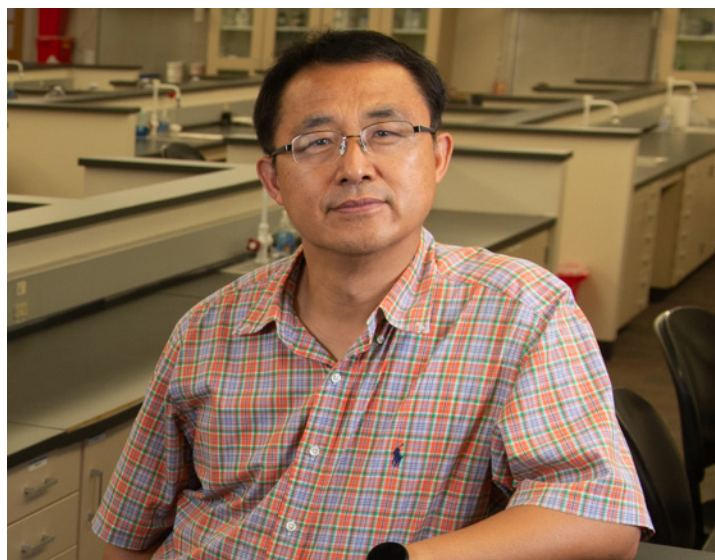
Luo's book systematically discusses the local analysis of bifurcation and stability of equilibriums in nonlinear dynamical systems. Previously, there was not an efficient way to investigate stability and bifurcation of dynamical systems with higher-order singularity equilibriums. For instance, infinite-equilibrium dynamical systems have higher-order singularity, which dramatically changes dynamical behaviors and possesses the similar characteristics of discontinuous dynamical systems. The book presents stability and bifurcation of equilibriums on the specific eigenvector, along with the spiral stability and Hopf bifurcation of equilibriums in nonlinear systems are presented through the Fourier series transformation.



Applications of 3D Modeling Digital Technologies to Industrial Problems

Felix Lee, PhD, Professor, Department of Industrial Engineering

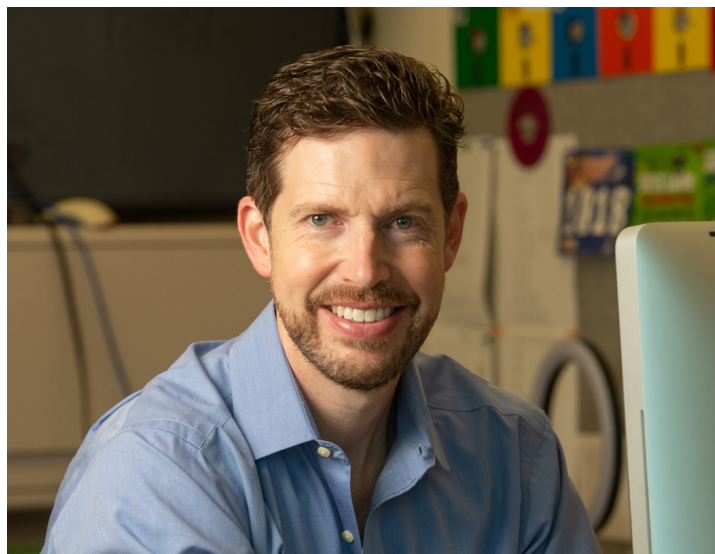
During his sabbatical leave, Lee focused on research projects dealing with applications of 3D modeling digital technologies to new industrial problems. While working with faculty members across disciplines at SIUE, Lee researched problems from multiple industries, including manufacturing, construction, biomedical engineering and pharmaceuticals. In one such project, Lee has been working to quickly and accurately estimate the load volume of construction dump trucks using just a few photo images by applying 3D-model based reverse engineering and deep learning methods. He is currently in the process of seeking patents and publishing his research to journals and conferences.



Generating and Analyzing Moving Objects and Trajectories for Spatiotemporal Databases

**Mark McKenney, PhD, Associate Professor, Department of
Computer Science**

McKenney's project addresses two aspects of spatiotemporal data analysis. First, he focused on a need in the field to create a data generator for moving object data by developing software packages to create moving objects with user-defined properties to aid the research community in designing and testing new algorithms. Second, McKenney explored the mechanics to aid in the analysis of trajectories when using clustering algorithms. Distance measures have been proposed for clustering that are affine invariant, which is helpful when data may be collected at different scales. McKenney's research examines such methods, identifies problems that occur when applying those measures to trajectories, and provides solutions.



ADVISORY BOARD SPOTLIGHTS

Members of the School of Engineering Advisory Board and Industrial and Professional Advisory Councils (IPAC) represent a variety of industries and provide strategic support and guidance to the School. The input they offer helps the School strengthen curriculum, prepare for future trends, and foster industry partnership.



Kay Guse
BS Industrial Engineering '88
Retired Director of Program Management, The Boeing Company
School of Engineering Advisory Board

“My heart’s passion has been creating and implementing a vision where Boeing and the University work together to develop students and curriculum equipped to meet the needs of emerging technologies and airplane programs.

The School of Engineering continues to be an important contributor of outstanding students to the businesses in our area and around the country. When I talk to parents or high school students considering SIUE, the first thing I tell them about is the unwavering commitment of the advisory board members to hiring graduate students.

My favorite part of supporting the School of Engineering has been the interaction with students—during opening houses and lectures, while awarding scholarships and internships, and by mentoring graduates hired by Boeing who are now engineers contributing to airplane programs. The students are where the inspiration happens.”



Jeff Croxell
BS Computer Engineering '06,
MS Electrical Engineering '09
Lead Software Engineer, Enertech Global
Computer Science IPAC

“I have served on the IPAC board for six years because I enjoy seeing the students’ senior capstone projects. I also like to provide real-world input while learning about new tools and technologies from the students. By serving on IPAC, I can remain involved with the many aspects of the program while showing my appreciation for SIUE.

The School of Engineering’s best strength is producing value. Personally, the solid engineering education I received at SIUE has served me well in my career. As a hiring manager, I know that SIUE’s engineering students have a strong foundation and can do real work immediately. The School of Engineering does a great job producing well-rounded, quality engineers.”



Rick Burns
Retired Project Manager, The Boeing Company
Adjunct Lecturer in the Department of Mechanical and
Mechatronics Engineering
Mechanical and Mechatronics Engineering IPAC



“I serve on the Mechanical and Mechatronics Engineering IPAC to use my industry perspective to help guide the Department to practices that will enhance the standing of the School in the assessment of industry and to encourage students to achieve high standards, find enjoyment, and develop perseverance in the engineering profession.

The School of Engineering’s strengths include the many students and faculty that possess an excellent attitude towards the need to develop practical engineering skills, the excellent facilities from classrooms, labs, and the Fowler Student Design Center for special projects, and its close proximity to a diverse industry of aerospace, automotive, agriculture, chemicals and electronics.”

Ashlee Peno
BS Civil Engineering '04,
MS Civil Engineering '05
Civil Engineering IPAC



“The School of Engineering benefits our region by producing well-prepared, hardworking graduates. By participating on the IPAC board, I have had endless opportunities to work with engineering graduates and am continually impressed by the quality of alumni the School produces.

The Department of Civil Engineering, School of Engineering and SIUE as a whole have given me so much throughout life. They provided me with the education and opportunities that have led to the success I’ve experienced thus far in my career. As a way of saying thank you, I want to do my best to continue the tradition by using the knowledge I’ve gained along the way to help the department grow.

Unfortunately, the structural engineering community has seen some devastating failures in the last few years, including the Hard Rock Hotel in New Orleans. As a member of the demolition team, I saw firsthand the destruction that can happen when the processes meant to keep the public safe break down. The School addresses challenges such as these by staying engaged with practicing engineers, such as adjunct professors and those on advisory boards. I have seen the School go beyond the technical basics to address deeper issues like risk and liability in order to better prepare their students for the real world.”

The complete list of IPAC and advisory board members can be viewed at siue.edu/engineering/about/advisory-board.

FROM THROWING JAVELINS TO FLYING DRONES, ALUMNA MCCONNELL REACHES NEW HEIGHTS



Alicia McConnell, BS civil engineering '07, has had an unconventional ride throughout her engineering career. During her time at SIUE, McConnell excelled as an athlete, becoming an all-conference, all-region and all-American player as a member of the softball team. During her senior year, she became a star javelin thrower for the track and field team, finishing 10th at NCAA Nationals.

“My time at SIUE taught me to be adaptable and to always continue learning,” shared McConnell. “My career path hasn’t been conventional, but it has been rewarding to apply my civil engineering knowledge and experience in a way that combines technology with traditional civil engineering practices.”

Upon graduation, McConnell went on to work as a civil engineer for Oates Associates in Collinsville, then Strand Associates in Joliet while competing as an athlete for Nike. During this time, she participated in numerous U.S. Championships and Olympic Trials in the javelin throw. She was selected for the 2011 Pan American Games and won the gold medal after a throw of 58.01m, her personal best.

Currently, McConnell serves as an Unmanned Aerial System (UAS) project manager at Michael Baker International in Peoria. In her role, she incorporates UAS technology for civil engineering applications, such as bridge inspections, surveying and mapping, and environmental monitoring.

“The SIUE engineering program’s strengths are in its faculty and facilities,” said McConnell. “My professors taught me a relevant, thorough curriculum that prepared me for the workforce. A dedicated staff that is interested in the well-being of its students is the School’s best strength. I became well versed in using tools of the trade during my time on construction sites because I had relevant experience from my coursework and lab time.”

McConnell believes that the engineering profession needs more young, driven professionals to build the world’s future infrastructure. “There is a shortage of strong civil engineers to perform design work and become leaders in companies like mine,” she said. “To address this challenge, engaging graduates with job opportunities and placing them in meaningful careers is the best thing the School of Engineering can do.”



ALUMNUS WEBER PROVIDES INNOVATIVE FOOD TECHNOLOGY



Although vertical farming is a rapidly growing industry, the practice struggles to achieve profitable returns and provide the promise of affordable healthy food for future generations. To overcome those challenges, Chico Weber, BS manufacturing engineering '13, has invented GrowMotion, a robotic grow light, to enhance vertical farm profitability and help feed the world.

Located in St. Louis, GrowMotion mimics the motion of the sun by slowly passing over crops, covering the grow space of three fixed grow lights. The moving grow light is designed for farmers and food service companies that wish to reduce energy use and the cost of running grow lights in a greenhouse or indoor vertical farm.

“When I first started building my own hydroponic grow systems, I was blown away by the expensive price of modern LEDs,” shared Weber. “It’s a huge capital cost to cover a large indoor grow space with lights, whether they are LEDs or metal halides. This makes most indoor farms unprofitable. I saw an opportunity in the market to not only reduce energy, but also reduce the cost of covering a large space with grow lights.”

GrowMotion is the premier product of SquareFruit Labs, a research facility Weber founded in January to develop food technology that reduces the amount of energy needed to grow food. Currently, the company is working with a small group of local non-profits to roll out a series of community gardens that will grow food year-round using GrowMotion. These gardens will provide food locally with a higher goal of providing onsite job training in the robotics and agtech space.

Weber credits his time at SIUE with providing the hands-on experiences necessary for inventing energy-saving technology. “I like to build products—everything from 3D printers to robotic arms to agtech solutions,” he said. “SIUE gave me the opportunity to get my hands dirty while working on their solar car and with their 3D printers. I learned the necessary skills to develop new innovative products within the School of Engineering.”

It is no secret that alumni philanthropy is key to success in higher education. If you are a proud Cougar graduate, consider supporting engineering scholarships, competitions, professional student organizations, research and more. Help us continue shaping tomorrow’s innovation today with a gift to siue.edu/give-now/engineering.

ALUMNUS MIKE MARCHAL INDUCTED TO HALL OF FAME

The School of Engineering is pleased to recognize Mike Marchal as its 2021 inductee to the SIUE Alumni Hall of Fame. A construction management professional with 27 years of experience, Marchal currently serves as president of Holland Construction Services, where he began as a project manager in 1997.

Marchal is a leader who is passionate about nurturing the growth and development of Holland Construction, his family and his community. Throughout his career, he has been involved with many professional organizations, including Leadership Council of Southwestern Illinois, Associated General Contractors of America Board of Directors, Young Presidents' Organization, Regional Business Council Mentor Network, Big Brothers Big Sisters, and the SIUE School of Engineering Construction Management Advisory Board.

Additionally, Marchal enjoys paying it forward by mentoring students in both high school and college. He has previously held active fundraising roles in United Way of Greater St. Louis campaigns, within his church and the Greater St. Louis Area Council of the Boy Scouts of America.

"The School of Engineering has provided best-in-class talent to Holland since our company was founded over 35 years ago," shared Marchal. "More than a third of our office staff and over half of our company's owners are graduates of SIUE's construction management program, including me. We feel extremely grateful to have a program of this caliber in our immediate area and are proud to be part of its history. By staying involved at the University through boards, committees and scholarships, we are honored to be part of SIUE's bright future."



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The faculty, staff and students at the School of Engineering extend sincere appreciation to all our alumni, friends, corporate partners, foundations and organizations who contributed to the school in fiscal year 2021 (July 1, 2020-June 30, 2021). Every gift makes a positive impact on the success of our degree programs and our students. We are grateful for their investment. On behalf of everyone at the school, thank you for making a difference in the lives of our future engineers, computer scientists and construction managers.

Sincerely,
Cem Karacal, PhD, Dean
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