2021

IOWA ENGINEER
ENGINEERING FOR THE NEXT GENERATION

RESEARCHER
SCHOLAR
TUTOR
ALUMNA

ALLISON ROWE
MECHANICAL
ENGINEERING MAJOR

IN THIS ISSUE:
TEACHING AND RESEARCH
DURING COVID-19
MARISSA MUELLER NAMED
RHODES SCHOLAR
ASHTON FAMILY CARRIES
ON ENGINEERING
TRADITION
Greetings from the College of Engineering at the University of Iowa!

I am delighted to bring you this latest issue of Iowa Engineer. As I round out my first year as dean, I want to emphasize how grateful I am for the dedication of our faculty, staff, and students, especially given the challenges the COVID-19 pandemic has presented.

This issue will reflect our responses to those challenges and will share stories of how we have developed new research in response to the pandemic, how we have adapted to remote and hybrid learning, and how we have ensured that the resources and support so central to our college mission have continued despite disruptions in our work and daily lives. These transitions have not been easy. They have required extra hours of work, led to a fundamental change in how we teach and conduct research, and created a noticeable disconnect in our interpersonal interactions. But, as I have said, engineers are resilient, and engineers persevere.

In the pages to come, you will see stories of the outstanding achievements of our faculty, students, and alumni. You will read stories that focus on engineering for better health, the safe and efficient use of emerging technologies, and innovations in the classroom. You will learn about alumni successes and their continued support for our college after graduation. Overall, you will get a snapshot of an engineering college in forward motion — one that is embracing its reputation as a small college of distinction that is transforming the world for the better.

Recent months have also seen a long-overdue reckoning with racial inequity as well as renewed calls for social justice reform and education. We have acknowledged our own shortcomings as a college and redoubled our efforts to improve our climate, diversify our faculty, staff, and students, and address long-held assumptions that have undermined our ability to come together as a college and university community. If we are going to produce socially responsible graduates and conduct ethical engineering research, then we must create an environment in which all members of the collegiate community are welcomed and supported, and where differing perspectives and contributions are sought out and valued.

I am excited to be leading the college at this pivotal moment. I am proud to see us rise to and overcome challenges. I am also encouraged by our acknowledgment of past failures and our plans for continuous improvement. This college is a community — a community of scholars, a community of innovators, and a community of learners. Our community is defined by its people, and I am honored to be part of it.

I hope you enjoy reading about the College of Engineering’s successes as a vibrant and dynamic community.

Harriet B. Nembhard
Dean, College of Engineering
Roy J. Carver Professor of Engineering
Although their operations changed during the pandemic, grocery stores remained open to serve their communities. That is part of the reason why Evan Lemker, a sophomore studying computer science and engineering, was able to complete his summer internship at Hy-Vee. Lemker’s work focused on assessing individual store compliance with IT security requirements, making sure systems were operational and fixing them when needed.

“COVID-19 didn’t impact my actual work as much as it affected my interactions with co-workers and store managers,” said Lemker. “It was much harder to build relationships, and things we take for granted, such as shaking hands, couldn’t happen at all.”

With the main Hy-Vee offices largely closed, Lemker did not get to meet many people at the office, as would normally be the case in this kind of internship. The shutdown did have some unforeseen benefits for his work. Digital tools, such as video conferencing, made it easier to communicate with colleagues and made his team more responsive.

“We were very glad to have Evan as part of our Data Loss Prevention and Information Security team. Evan played a key role in helping conduct store audits, making sure that sensitive data was properly handled and that our store technology was secure,” said Brooklyn Mazza, IT compliance manager at Hy-Vee. “He displayed incredible amounts of maturity and wisdom in his auditing activities, as well as living out our Hy-Vee fundamentals of being helpful, friendly, fair and respectful in his work.”

Lemker returned to Hy-Vee in the spring semester and will continue working there this summer, now helping with Hy-Vee’s software engineering needs.

“I am grateful that the pandemic was not entirely disruptive to my internship experience,” said Lemker. “I was still able to meet with store managers in person and help improve systems and processes across significant parts of Hy-Vee’s operations.”
When Emma Taylor started her summer internship at FarrPro, she was not sure if the pandemic would shut down operations. Although the team was small, much of the work at FarrPro, a company developing new technology for farrowing, needed to be done in person. Taylor, a third-year student studying computer science and engineering, knew that some of her work at FarrPro could not be done remotely.

“I was sure that I could write programming and work on user interfaces from home, but I didn’t think I would be able to maintain 3D printers without being there,” said Taylor. “I was glad that we took precautions and never fully shut down.”

FarrPro never had more than five employees in the building at any given time. Some of the other interns who worked on social media, ordering, and research papers did work from home. Everyone who remained on site worked in offices, as opposed to labs, and communicated mostly through digital interfaces. Taylor valued the efficiency that these communication tools added as well as the independence they provided.

“We hired Emma as a software developer, and she had the opportunity to work alongside our electronics vendor to launch a waterproof control device for our Haven brood heater. She proved to be an absolutely invaluable asset in that project,” said Cameron Smith, lead designer at FarrPro. “We were lucky enough to keep her on for another semester, and by that time we had made revisions to the original control device. She worked around these design changes and repeated her amazing work by helping us launch an improved control device.”

Although the work arrangement was not what she anticipated it would be before the pandemic, Taylor found her experience to be valuable, and she returned the following winter. “My time at FarrPro was less social than I had hoped. For example, I did not sit next to my supervisor and work on projects together,” said Taylor. “Even without that part of the experience, I was able to develop valuable skills in a professional setting which I plan on using in my career.”
ENGINEERING RESEARCHERS RECEIVE RAPID FUNDING FOR RESEARCH RELATED TO COVID-19

The Rapid Response Research (RAPID) funding mechanism invites proposals having a severe urgency with regard to availability of or access to data, facilities or specialized equipment as well as quick-response research on natural or anthropogenic disasters and similar unanticipated events.
NASA-funded study at IIHR explores connections between reduced air pollution due to COVID-19 and decreases in precipitation in the western United States

Gabriele Villarini, Director, IIHR-Hydroscience & Engineering

Research led by Gabriele Villarini is studying connections between reduced air pollution due to COVID-19 shutdowns early last year and sharp decreases in precipitation in the western United States. Researchers hypothesized that with fewer particulates or aerosols in the atmosphere, fewer raindrops and snowflakes fell, leading to a reduction in precipitation in the western United States. In February and March 2020, precipitation dropped by more than 50% from the average. This project is providing valuable information to support improved water resources management in drought-stricken areas of the West Coast.

NSF grant awarded to UI Engineering dean and team to study impact of transition to off-campus learning during COVID-19

Harriet Nembhard, Dean of the College of Engineering

College students across the country had their studies and on-campus life disrupted suddenly during the spring 2020 semester. Most universities and colleges quickly transitioned to online course delivery, closed campus housing, and dramatically changed university life for students accustomed to living, working, and studying on a college campus. A new study, supported by a National Science Foundation RAPID grant, is examining how these changes impacted engineering students in undergraduate programs. Over the past six months, the team has focused on engaging students as researchers and empowered agents in addressing the well-being and mental health of students. The team is also collecting data on student well-being that will capture their experiences over the past year and help inform future planning in the case of pandemic or emergent events.
UI Colleges of Engineering and Nursing collaborate to win an NSF RAPID grant to study cognitive work of triage nurses during COVID-19

Priyadarshini Pennathur, associate professor of industrial and systems engineering

A human factors engineering researcher at the University of Iowa is collaborating with her colleagues in the UI College of Nursing, the University of Iowa Hospitals and Clinics, and the University of Wisconsin-Madison Hospitals and Clinics to model decision-making among triage nurses during the COVID-19 pandemic. Triage nurses act as frontline gatekeepers and perform a difficult balancing act during a pandemic. They must not only ensure that patients who need immediate care get it in a timely manner but must also filter incoming patients to prevent infections and to reduce undue burden on hospital resources. During a pandemic, they make particularly complex and risky decisions. The project is studying triage nurses from two large academic medical centers and is analyzing triage phone calls and screen records for mapping a nurse’s patient-specific decision-making trajectories to reveal their constraints and how they managed them.

Electrical and Computer Engineering professors receive National Science Foundation RAPID grant for novel high-throughput and low-cost COVID-19 testing technologies

Weiyu Xu, associate professor of electrical and computer engineering
Raghu Mudumbai, associate professor of electrical and computer engineering
Xiaodong Wu, professor of electrical and computer engineering

Large-scale, high-throughput and accurate COVID-19 virus testings are vital tools in the fight against the ongoing COVID-19 pandemic. Public health experts believe that mass virus and antibody testings are essential to stopping the spread of COVID-19 viruses and enabling a safe and fast transition to normal social life. However, current testing capacity is limited, and, in addition, there is often a shortage of reagents needed for performing tests. There is an urgent need to increase the current testing capacity in the United States and around the world. This project on using compressed sensing technology for fast COVID-19 testing seeks to significantly increase the testing throughput and reduce reagent consumptions through mathematical and signal processing methods, without sacrificing test accuracy. This approach has been validated and adopted in research and clinical labs.
Engineering and public health collaboration leads to NSF RAPID grant on PPE materials that capture and kill pathogens

David Cwiertny, William D. Ashton Professor of Civil Engineering

Engineers at the University of Iowa and the University of Notre Dame are collaborating with a UI College of Public Health faculty member to develop personal protective equipment (PPE) that captures and kills viral pathogens, thereby improving PPE performance and reusability during the COVID-19 pandemic. The work leverages over a decade of collaboration on projects related to the use of a fabrication process called electrospinning to produce nanoengineered, multi-functional filtration materials for water treatment. The team is adapting its approach to making water filters and turning them into materials suitable for PPE. By integrating biocidal materials, the team aims to produce a composite nanofiber filter that will be able to capture and kill aerosolized virus in a lightweight, breathable framework suitable for integration into PPE like masks and respirators.

Mechanical Engineering faculty members receive NSF RAPID grant for research related to droplet transmission of COVID-19

H.S. Udaykumar, interim associate dean for graduate programs, research and faculty
Hongtao Ding, associate professor of mechanical engineering

Faculty members in the Department of Mechanical Engineering at the University of Iowa received a $200,000 1-year grant from the National Science Foundation to study how droplets containing viruses dry on solid surfaces. They are performing modeling and simulation work in tandem to reveal what types of seasonal conditions and surface modifications will contribute to diminished survival of viruses within droplets.
Anton Kruger, professor of electrical and computer engineering, teaches three undergraduate classes, including Principles of Electronic Instrumentation. The lab class teaches students important lab skills and exposes them to expensive electronic test equipment. Kruger is among the many faculty who met the challenge of creatively adapting this lab class to a virtual environment during the spring semester. One of the biggest challenges, he said, was the temptation to complete the lab exercises for one section, record it, and play it for the other three. “We did not do this,” he said. “We had an interactive lab for each section, and students were more apt to participate.” Because he didn’t record the sessions, students had to attend and stay engaged. Kruger had to get creative to adapt his Electronic Circuits course, during which students must build and test their own circuits. Because students could not use materials in the lab, Kruger contacted administrators of the Roy J. Carver Charitable Trust and was encouraged to submit a funding proposal even though it was outside the usual grant cycle process. The Carver Trust awarded Kruger $17,000 to purchase parts needed to create component kits for students to check out and use during the semester. Along with an additional $3,000 from the Department of Electrical and Computer Engineering, the kits proved to be a unique and highly successful adaptation that Kruger says was a team effort by many departments and units within the college.
Research Open House goes virtual

One of the many impacts of the COVID-19 pandemic was that the College of Engineering’s traditional spring Research Open House could not be held in person. In Fall 2020, the event moved to a virtual format with both presentations and judging taking place online. Students prepared PowerPoint presentations as well as short videos in a three-minute thesis style.

“We were especially excited to have so much alumni participation as judges from across the United States and around the world,” said Kristina Venzke, assistant to the associate dean of graduate programs, research, and faculty. “In the times before COVID, alumni had to travel to campus to serve as judges, and this year they could view the presentations and interact with students from anywhere.”

One participant, Moala Keshe Bannavti, used her experience at the college’s Research Open House to prepare for the Graduate College’s Three Minute Thesis (3MT) competition, where she was named the grand prize winner. Bannavti’s presentation focused on developing a new method of determining the extent of PCB contamination in school classrooms so it can be more inexpensively mitigated by schools serving low-income and underrepresented students.

“The 3MT competition taught me so many lessons: perseverance, dedication, non-technical communication and more,” said Bannavti. “I couldn’t have done it without the support of staff and faculty throughout the Graduate College and the Civil and Environmental Engineering department. It still feels surreal and humbling that I won.”
What attracted you to the College of Engineering at the University of Iowa?

Becoming dean of this college is a great match to my experiences and approaches to engineering education and research. Our college is a small college of distinction with outstanding student support, innovative faculty and staff researchers, and state-of-the-art facilities. The scale of the college is right-sized for the transformative collaborations that include and enhance the student experience. I am heartened to learn of the dedication of our faculty and staff to student engagement and success, all while we continue to produce ground-breaking research. We focus on the whole student — inside and outside of the classroom — providing them with opportunities to link engineering to ethics, the arts, business, and medicine as part of their experience at the University of Iowa. It is fulfilling to be a part of a college that produces such well-rounded engineers.

What do you see as opportunities for the college in the next five, ten, or 20 years?

The teaching, research, and outreach of the College of Engineering has the potential to impact a billion people in the years to come. Although that sounds like a large number, I would like to put it in some context. We have faculty members and researchers using world-class driving simulators to study and improve vehicle technology and automated driving. We have faculty members whose healthcare and biomedical research will have a direct impact on the diagnosis and treatment of diseases such as asthma and Parkinson’s. We have researchers improving water quality not just here in Iowa but across the country and around the world. We are home to a leading center focused on flood prevention and mitigation that serves as a model for other states impacted by flooding. Any one of these areas has the potential to improve quality of life for millions, if not billions, of people. Taken together, these efforts will impact, transform, and improve the health, safety, and security of not just Iowans but people all over the globe.
Why do you feel it is important for students to take coursework and have experiences outside of the College of Engineering?

Well before I first visited the university, I learned about the idea of an engineer and something more. Engineering is a difficult area of study. Our students are some of the most ambitious at the University of Iowa. But we do not want them to come away from their student experience with only technical skills. We want them to explore the entire university. So, we encourage them to infuse humanities coursework as part of their studies. We support them in their extracurricular pursuits as part of clubs, university athletics, and the marching band as well as citizens of this community. I see being an engineer and something more not as much about a list of activities as it is a mindset, a mindset that connects societal issues and humanities to engineering. Our students have a dynamic collegiate experience, and they leave this campus as ethical and globally aware citizens who understand the importance of societal impact and social justice.

What research areas do you see emerging across the college?

Not only is this university known for its liberal arts education, it also has a world class medical campus just across the Iowa River from the Seamans Center. Our faculty members collaborate with colleagues in the Colleges of Medicine, Dentistry, Nursing, Public Health and Pharmacy. We also have environmental engineers committed to improving water quality as well as detecting and eliminating pollutants. One way to think about these research collaborations is under an umbrella of engineering for better health, a research focus that touches all of our departments and research centers. These research areas hold enormous promise for improving quality of life and transforming healthcare efficiency, safety, and innovation. One of the many lessons we can take away from the COVID-19 pandemic is that we need scientists, engineers, and ethicists to quickly respond and help navigate a rapidly changing world.

How can the college be more responsive to and aware of its role in promoting diversity, equity, and inclusion?

Engineering research has not always included diverse perspectives and communities in the development of new technologies. For example, until recently, research focused on automobile safety has not accounted for differing male and female body types, and technology using facial recognition has failed to work on darker skin. Additionally, assumptions made about access to technologies and the availability of services such as broadband have seen innovations deployed in ways that further marginalize communities. In order for engineering to fully rise to the level of its capability and ethical responsibility as an agent in advancing society, we must acknowledge the ways in which engineering improves quality of life while working to address biases and silos that are entrenched within the discipline. Our college must take responsibility for activating plans to diversify our faculty, staff, and student body. Most importantly, we must ensure that this college is a space where everyone in our community feels welcomed and able to thrive.

How would you describe your first nine months as dean?

Although I can say that this was not how I expected my time to start when I accepted the position in December 2019, I have been impressed with the adaptability and resilience of our faculty, staff, and students. Our students have remained connected and engaged, and our faculty and staff have continued their research excellence and classroom innovations. As we approach what is hopefully a turning point in the pandemic, I am excited that we will be able to return to campus and come together, now in-person, as an engineering community. I look forward to gatherings and celebrations and to see the Seamans Center bustling with life again. In the fall, I plan to make my way throughout the building and campus, popping into offices and classrooms, grabbing a cup of coffee with colleagues, and walking through the common spaces that are second homes to many of our students. I am truly looking forward to what is to come.
Amina Grant, PhD student in Civil and Environmental Engineering

There is no safe level of lead. Lead is a heavy metal and neurotoxin, which can be especially dangerous for children when consumed. It can slow growth and cause long-term damage to the brain and nervous systems. The only way to know if you have lead in your drinking water is to measure it. You cannot see it, smell it, or taste it. Amina Grant’s work focuses on estimating homeowners’ potential exposure to lead in Iowa drinking water systems using publicly available data. Recently, she released a paper where she estimated about 65,000 Iowans are at risk from drinking water lead levels above the Environmental Protection Agency’s action level of 15 parts per billion (ppb). In addition to the data science, she also works with a team of researchers through the Get the Lead Out program, where they offer free drinking water testing for lead, copper, and other water quality measurements, such as nitrate and arsenic. So far, they have offered over 550 water sampling boxes to Iowans across the state.
Megan Lindmark, PhD student in Civil and Environmental Engineering

Access to safe drinking water continues to be a challenge for billions of people worldwide. Hundreds of rural communities across Nicaragua and Honduras use one drinking water treatment solution: an in-line chlorinator, installed in a partnership with nonprofit EOS International, one of Megan Lindmark’s projects. These relatively simple devices are constructed out of PVC and use the chlorine tablets used in swimming pools to disinfect community-wide drinking water sources. Her research seeks to outfit these chlorinator systems—in partnership with EOS International and local communities—with water quality sensors and cellular modems powered by solar panels to collect and transmit water quality data in real time. The crux of this research is translating this real-time data into useful, actionable alerts for technicians, indicating system failure or insufficient chlorine levels. This can allow technicians to act more efficiently, like an ambulance, visiting systems when they need assistance and water quality help, rather than simply in a cyclical fashion. She hopes that these smart chlorinators can help elevate community water safety even further and help provide more consistent, safer drinking water across Central America.

Gregory Ewing, PhD student in Civil and Environmental Engineering

Many times, making a choice requires distributing benefits and harms unevenly. If an algorithm assists in decision-making, how can it account for what people deem good and bad, ethical, and just? This is a question Gregory Ewing considers in the context of decision support, novel technologies, and our water environment. Ewing has developed an online voting platform to collect people’s preferences on outcomes to ethical dilemmas. He calls his platform the Water Ethics Web Engine (WE2, for short.) Using WE2, he collects data to build decision models using machine learning techniques. In a recent study, Ewing found that user-driven decision models can capture “group wisdom” on outcomes related to flooding. These findings may one day help make real-time decisionmaking more representative to communities and their concepts of right and wrong.
The University of Iowa National Advanced Driving Simulator is already an international leader in automated driving research and development, as they have been researching advanced vehicle technologies—primarily ones that help avoid crashes—for over 25 years.

The past year has seen some major funding awards, most notably:

Most recent transition of control study: $1.45M NHTSA award

In the last several years, UI researchers have worked on a series of studies funded by NHTSA to study transition of control into and out of automated driving mode—all done in the NADS-1 simulator. The most recent of these was announced in fall 2020, a $1.45M award about “temporal components of warning” that will ask:

- What kind of notification should the driver receive when they are transitioning from automated driving back to manual control?
- How many seconds does the driver need to first gain situational awareness and then start driving manually again?

“This builds nicely on previous research we’ve been doing for years with NHTSA on other transition of control models,” says John Gaspar, director of human factors research at NADS. “We’re finding that threshold between what’s safe and unsafe—so we need a high-fidelity simulator to do that.”

“We’re finding that threshold between what’s safe and unsafe—so we need a high-fidelity simulator to do that.”

JOHN GASPAR, NADS DIRECTOR OF HUMAN FACTORS RESEARCH
ADS for Rural America: $7M U.S. DOT award

Set to begin in summer 2021, Automated Driving Systems (ADS) for Rural America will use a custom Ford Transit shuttle bus equipped with LIDAR, computer vision systems, RADARs, and high-definition maps to drive in automated mode. A specially trained safety driver will be behind the wheel at all times (with a co-pilot), and they will follow a 47-mile route through parts of Iowa City, Hills, Riverside, and Kalona, Iowa—experiencing different types of roads and conditions along the route.

This study will analyze how automation works with the unique challenges of rural roads (gravel, steep grades, farm equipment on the road, etc.), and it aims to show the benefits of automated vehicles to people with mobility issues. Researchers will recruit individuals from local communities—who will be age 65 and older or have a disability that affects their ability to drive—to be passengers in the automated vehicle. The data from this project will be made publicly available.

“Most automated driving testing is done in urban areas with perfect roads. Our work tests such systems on the most common roads in America—rural ones,” said NADS deputy director Omar Ahmad.
she was the student speaker at the College of Engineering’s Spring 2020 Commencement. **Allison Rowe** was a Grand Challenges Scholar, a tutor in the Hanson Center for Technical Communication, and an undergraduate researcher. Now, with her mechanical engineering degree in hand, Rowe is taking what she has learned at the University of Iowa and is starting her career at Design Engineers, a building system design firm in Madison, Wisc.

“My experience at Iowa went so far beyond my engineering coursework,” said Rowe. “I had the opportunity to experience engineering around the world, help my peers hone their writing skills, and work at a cutting-edge biotech startup, all while positioning myself for success beyond the university.”

Rowe saw first-hand the kinds of ground-breaking research resulting from collaborations between the UI’s Roy J. and Lucille A. Carver College of Medicine and the College of Engineering when she joined a research lab her freshman year, a lab where she was a team member all four years of college. She worked closely with Sarah Vigmostad, an associate professor of biomedical engineering and Michael Henry, a

**RESEARCHER, SCHOLAR, TUTOR, ALUMNA**

The breadth of experiences that defined Allison Rowe’s journey

Exploring the Irish countryside during the Irish Writing Program in Summer 2017. Photo credit to Delany Breitbach.
professor of molecular physiology and biophysics. Vigmostad and Henry are the co-founders of SynderBio, a startup that is designing a new rapid and label-free approach to isolate and enrich malignant cancer cells from biological specimens. Rowe applied her undergraduate research, which focused on how fluid mechanics can predict whether a drug will be effective, in her work at SynderBio.

“Allison is highly motivated and independent in the lab,” said Henry. “She is a creative thinker and problem solver who will do great things.”

“She did such a good job of considering different perspectives and ways to interpret results and was always two steps ahead of us and was thinking about what additional experiments she should do further test a hypothesis or confirm a finding,” said Vigmostad. “Her ‘big picture’ thinking, her strong communication skills, and her drive and initiative made her a very successful student and I know will continue to make her successful as a practicing engineer.”

As a Grand Challenges scholar, Rowe was dedicated to “Engineering Better Medicines,” one of the 14 Grand Challenges as defined by the National Academy of Engineering. Not only did Rowe have the opportunity to see engineering in action in a global context, but she was also able to apply her minor in English as she traveled in Dublin studying creative writing and English literature as well as in Athens where she saw the historical sites on which many Greek myths are based.

“Allison is an exemplar of the ‘Engineer and something more’ motto and has successfully marshalled her creative interests in writing, photography, and international travel to most effectively communicate advances in engineering research to the broader public,” said Anat Levtov, director of global experiences in the College of Engineering.

Working as a peer tutor in the Hanson Center for Technical Communication, Rowe helped her College of Engineering classmates improve essays, applications, and lab reports.

“I had the opportunity to experience engineering around the world, help my peers hone their writing skills, and work at a cutting-edge biotech startup, all while positioning myself for success beyond the university.”

ALLISON ROWE, ME20

Overlooking downtown Athens at dusk after a hike to Mount Lycabettus.
“Communication, and especially writing, really are part of becoming a successful engineer,” said Rowe. “I initially chose to pursue a minor in English because I love the subject, but I quickly realized its benefits as an engineer, enhancing my critical thinking, speaking, and collaboration skills.” Rowe applied these skills directly when speaking with Bay Area investors with the SynderBio team at a startup accelerator event at UC Berkeley.

The ultimate acknowledgement of Rowe’s success as a student and proficiency as a communicator came when she was asked to speak at the 2020 Spring Commencement. Although Covid-19 prevented the university from holding an in-person commencement, Rowe delivered her remarks virtually, framed by the Pentacrest in the background.

After graduation, Rowe joined Design Engineers and has worked on a number of projects, including a bank, library, community center, police station, and low-income housing development, where she has applied her technical engineering skills along with her writing and communication expertise.

“Allison’s combination of an engineering degree with an English minor has proven very beneficial because consulting requires accurate and concise communication with both internal and external project team members along with the technical knowledge of engineering,” said Jared Ramthun, associate principal and senior mechanical engineer at Design Engineers. “She is able to learn and apply new concepts very quickly, allowing her to expand her knowledge base in a very short amount of time and tackle new and more complex concepts.”

“I learned so much as a student at the University of Iowa,” said Rowe. “Having the opportunity to speak to the graduating class was a tremendous honor and represents the culmination of everything I have worked for in my time as a student. I would not be where I am in my career today without the support I received in the College of Engineering.”
an athlete on the Iowa women’s track and field team, Marissa Mueller has worked hard at remaining calm under pressure. She used those skills as she interviewed for the most prestigious opportunity of her college career.

Mueller, who graduated in May 2021 with a degree in biomedical engineering, is from Petrolia, Ontario, Canada, and in Nov. 2020 was named one of that country’s 11 Rhodes Scholars. She is the 22nd UI student to receive the honor, and the second female.

Beginning in fall 2021, she will spend two years studying stem cells and regenerative engineering at the University of Oxford in England.

She says neither the Rhodes scholarship nor any of her other achievements would have been possible without dozens of people at Iowa who have helped her—in the classroom, in the neuromuscular biomechanics research lab, and on the practice field.

“So many people at the university believed in me. They helped me take advantage of all these opportunities and helped me see the potential in each of them, and in myself when I didn’t see it,” she says. “They inspired me to chase my dreams. I am beyond humbled and thankful. There is no way
“So many people at the university believed in me. They helped me take advantage of all these opportunities and helped me see the potential in each of them, and in myself when I didn’t see it.”

**Mariissa Mueller, BE21, 2021 Rhodes Scholar**

Harriet Nembhard, dean of the College of Engineering, was part of a mock interview panel as Mueller prepared. Nembhard says she gave Mueller homework after the mock interview so that Mueller could improve her answer to a tough question.

“What sets Marissa apart is how she handled my critique with grace and completed the follow-up assignment,” says Nembhard. “She was able to communicate with both knowledge and empathy. A student who can do this—even on a second or third attempt—will be a positive force to change the world.”

Mueller is an example of how opportunities within the college translate to success, Nembhard says.

“Our faculty get to know and mentor students on an individual level. Students have opportunities to gain valuable engineering experiences and equip themselves with engineering ethics and skillsets,” says Nembhard. “The result is rigorously educated engineers who will solve problems to address the needs of humanity and the welfare of society.”
Laura Frey Law, associate professor in physical therapy and rehabilitation science, has been one of Mueller’s mentors since Mueller began working in her lab in 2018. Before coming to Iowa, Mueller says she hadn’t considered research, thinking it wasn’t for her. Looking back, she says it was one of the best decisions she has ever made.

Mueller met Frey Law the second semester of her freshman year when she interviewed to be a research assistant in her lab.

“I felt overwhelmed and out of my league,” Mueller says. “The way that she explained these research concepts to me, she was kind and understanding. She’s just an outstanding person, researcher, and mentor.”

Frey Law says Mueller is unafraid of feedback and criticism and dives into research problems with her full effort.

“If there is something she doesn’t know, she finds a way to find out more about it. That may involve getting feedback on her work to make it better, or learning a new computer program to write custom code,” Frey Law says. “It has been a great experience to be able to watch and support Marissa through this process. I am so incredibly proud of her and excited for her to have this opportunity.”

Mentoring students such as Mueller is one of the most fulfilling parts of her career, says Frey Law, who was a Rhodes finalist herself when she was a biomedical engineering student at Iowa in 1989. Frey Law, who grew up in Iowa City, received a bachelor’s degree in engineering and a master’s degree in physical therapy from Iowa. She then completed a master’s degree in engineering at the University
of Michigan but returned to Iowa for her PhD in rehabilitation science, which she received in 2004.

Being closer to family and Iowa’s outstanding programs were the reason Frey Law and her husband, Ian Law, returned to Iowa City.

“The Carver College of Medicine was a great match for my husband, and Iowa’s College of Engineering and Department of Physical Therapy and Rehabilitation Science were a perfect match for my research interests,” she says. “Iowa is one of only a handful of places that has all three of these programs in one place. The highly collaborative and supportive environment here at Iowa is a big reason why I have always been so happy here.”

Mueller says she’s been interested in stem cells and regenerative engineering since undergoing several knee surgeries when she was younger. Two of them, she says, involved the technology.

“It was a relatively new kind of operation,” she says. “I thought it was the coolest thing, and I did a report on it in sixth grade and another one in high school.”

She describes her area of interest in this way:
“Stem cells are certain cells in your body that have really cool capability to turn into little machines that fix what your body needs. They can turn into many different types of cells to heal the body. The research I hope to do will help us better understand how these cells work and how they can be manipulated and harnessed to treat diseases that are currently incurable.”

Kelly Thornburg, director of scholar development at the UI Honors Program, says people often ask her what makes someone a good fit for the Rhodes Scholarship.

“For most people, including Marissa, there needs to be powerful attraction to complex problems,” Thornburg says. “For her, it is the tangle of biological, practical, and ethical questions at the heart of stem cell research that calls her to pursue the extraordinary challenge she will find at Oxford University. I am excited to see how her relationship to those questions will be altered by her coursework, as well as by her connection to this diverse community of young scholars, creators, and advocates from all over the world.”

This is the question Dean Harriet Nembhard asked Marissa Mueller to improve her answer to as part of Mueller’s preparation for her Rhodes Scholarship interview:

How might you pivot your research agenda or otherwise use your engineering training (especially technical methods, theory, frameworks) to help dismantle systemic racism for Canadian indigenous communities?

Engineering frameworks create a nice scaffold in which technical methods and theories may be discussed. We are taught to consider our assumptions when breaking down a large engineering problem and envisioning creative solutions. When applied to Indigenous communities, an example may involve rectifying health care inequalities as a piece of the solution to dismantling systemic racism. We may falsely assume that members of these communities want access to large, state-of-the-art facilities; in reality, individuals may value a connection to their land and community—staying at home—more than the potential benefit of being cared for at a larger center. This is an example of breaking down the problem. After this is done and solution spaces are explored, specific engineering tools might be used to attack the problem. We can employ technical training in statistics, computer science, and mathematical modeling to modify current medical devices such that they are portable, cost-effective, and tailored for direct use within Indigenous communities. We can modify devices to meet patient needs. This is what engineering students are trained to do, for example, in our Senior Design capstone course that emphasizes our role in society and how we can be socially cognizant agents of change.
shape of any object determines both its visual appeal and physical characteristics. Shapes can, in fact, be essential in solving engineering problems, making cars more fuel efficient, helping rockets fly further and faster, and understanding aspects of our universe such as the behavior of solar weather. With a focus on the importance of shapes in engineering, Stephen Baek, assistant professor of industrial and systems engineering, is using artificial intelligence (AI) to study the shapes of objects, ultimately using those shapes to improve performance and aesthetic quality.

“Patterns help us understand what is happening,” said Baek. “For example, through medical AI we can look at thousands of tumor images and see that particular shapes such as round tumors might be less deadly than malformed tumors.” Because AI can process vast data sets, memorize information, and run complex simulations, systems can identify patterns that match conditions.

Although the processing power of AI is vast, it does not contain the kinds of creativity and ability to explore outside of problem boundaries found in humans. Baek sees an opportunity for humans and AI to collaborate by harnessing AI’s ability to collect and analyze data while allowing human designers to focus on creativity. “We can write codes for computers, and AI can analyze complex patterns and trends, but AI does not possess the kinds of cognitive intelligence that allows for human decision making and problem solving,” said Baek.

By using AI to analyze and assess shapes, scientists and engineers can be better equipped to solve problems in areas such medicine, material science, and military physics, especially when designers can incorporate human creativity into the solutions. The AI systems developed in Baek’s lab have been used to understand the patterns in microscopic images of materials, complex patterns from physics simulations, biological shapes, human body shape analysis, and human performance and ergonomics.

Baek’s work has been supported by funding from the National Science Foundation, NASA, the U.S. Air Force, and the U.S. Department of Transportation Federal Highway Administration.

“Our AI models will have significant applications in medicine, biology, materials science, and physics,” said Baek. “It is the use of these models, combined with human imagination, that will help us solve pressing issues in science and engineering.”
LIGENCE
CELEBRATED
been a whirlwind 12 months since Suman Sherwani graduated from Iowa. She’s working on NASA-funded rocket and satellite missions in the UI Department of Physics and Astronomy, and is featured on Forbes’ “30 Under 30” list for science.

Suman Sherwani entered the University of Iowa figuring she’d gain the knowledge and skills for a career in innovative technologies.

She became a rocket scientist instead—and just a year after receiving a Bachelor of Science in Engineering, the Iowa alumna has landed on Forbes’ “30 Under 30” list for 2021, which honors young scientists, entrepreneurs, activists, and entertainers.

“I’m really thankful to have received this honor,” Sherwani says. “There are so many amazing people on that list, so it’s a little unreal for me to be included on there with them.”

Following graduation in December 2019, Sherwani was hired by Iowa’s Department of Physics and Astronomy as a design engineer for upcoming sounding rocket and satellite missions, including a $115 million NASA-funded mission—the single largest externally funded research project in institutional history—to study the mysterious interactions between the magnetic fields of the Earth and the sun.

“Space has always been really inspiring, but our technology depends so much on satellites these days,” Sherwani says. “It’s so important for us to understand it too. You get to feel the rush of a rocket launching, and you’re contributing to science and the advancement of society. I can’t think of anything I’d want to do more than that.”

Sherwani began her work on the TRACERS mission at the beginning of 2020. She was just starting when COVID hit. The TRACERS team had to get creative and figure out new ways to work together safely.

“It’s been a really interesting year, but I’m so proud of the work we are doing and how much we were able to accomplish, even during a pandemic,” she says. “We were able to rapidly develop our prototypes, and I think we are very much on track for a successful mission.”

Sherwani, from Naperville, Illinois, once worked at Tesla Inc., explaining to the public the engineering principles behind electric cars, while earning an associate’s degree in engineering science at the College of DuPage in nearby Glen Ellyn, Illinois.

At Iowa, she embarked on her next academic pursuit: a Bachelor of Science in Engineering in electrical and computer engineering, with a minor in computer science. Her rationale: She would be well positioned to work in current and emerging technological fields.
I went to Iowa thinking when I graduated, I’d go back and be an electrical engineer at Tesla,” Sherwani says. “I already worked there. I have some rapport there. I know people.”

Yet in October 2018, her plans changed dramatically. Sherwani had been selected to participate in the Canada Norway Sounding Rocket program, an intensive, four-and-a-half-day international student exercise in Norway to design, build, and fly a sounding rocket toward the atmosphere’s outer boundaries. The experience opened to her a field she didn’t know existed.

“I didn’t realize you can launch rockets for a job, that you could just literally do science using rockets,” Sherwani says. “I had no idea that this was something I could do for the rest of my life.”

Sherwani chose Iowa in large measure because of the overwhelmingly positive responses she received from friends who had attended the university. She also liked the big-campus college atmosphere on offer and the community feeling of Iowa City.

She chose to major in electrical and computing engineering for practical reasons as well as her desire to be current with innovative technologies.

“I thought electrical and computer engineering is so much a part of our daily lives, I felt like I needed to understand what it was,” says Sherwani, who praised the College of Engineering for its academics and faculty. “It didn’t make sense to me that most people don’t know how it works. It was broad enough that I could work with any kind of innovative technology that I chose to.”

In a spring 2017 class, Engineering Fundamentals II: Electrical Circuits, she met course instructor Mark Andersland, who told her and her classmates about a scholarship opportunity. That fall, Sherwani asked Andersland to be her academic adviser and met with him frequently to discuss school work and professional opportunities.

One such conversation came when Sherwani mulled an offer to work on software programming and applications at a summer-fall co-op at Collins Aerospace in Cedar Rapids, Iowa.

“(Andersland) gave me some really great advice that I still use to this day,” Sherwani says. “He told me, ‘It’s what you make it. Lead the way, lead how you want it to be, and make the experience what you want it to be,’ and that’s exactly what I did.”

Andersland, associate professor in electrical and computer engineering, says Sherwani invariably had the right frame of mind in her approach to academics and extracurricular options.

“She was willing to take action and do what it took to be successful,” Andersland says. “She has the right perspective, and that comes from maturity and her personality.”

Sherwani learned about rocket school from David Miles, assistant professor in the Department of Physics and Astronomy, who led Iowa’s inclusion in the program. (Iowa is the first and still only American university to participate.) She learned all about rocketry, from design to build to launch.

To top it all off, she was the one who pressed the button to fire the rocket.

“It was the coolest thing ever,” Sherwani says. “I was part of a real rocket mission. I couldn’t believe that was a job that people have, and I knew I needed to do this.”

Now, that’s what she will be doing for the foreseeable future—and at Iowa too.

“You think you have this linear plan in mind, but when you get here, you start to figure out who you are as a person and what makes you happy,” Sherwani adds. “Iowa gave me all those opportunities to figure out who I am.”

“[Mark Andersland] told me, ‘Lead the way, lead how you want it to be, and make the experience what you want it to be,’ and that’s exactly what I did.”

SUMAN SHERWANI, UNIVERSITY OF IOWA
DEPARTMENT OF PHYSICS AND ASTRONOMY
University of Iowa Professor of Civil and Environmental Engineering and Iowa Flood Center (IFC) Director Witold Krajewski has been elected to the National Academy of Engineering (NAE), one of the highest honors conferred in the field of engineering.

Krajewski, who was elected for his advances in flood prediction and flood risk reduction, also is a faculty research engineer at the UI’s IIHR—Hydroscience & Engineering, a world-renowned center with more than 100 years of experience in education, research, and public service focusing on hydraulic engineering and fluid mechanics. Krajewski’s research expertise and vision have transformed Iowa into a more flood-resilient state that is serving as a model for others, including Texas, Missouri, Nebraska, Louisiana, and North Carolina.

“Election to NAE is a well-deserved recognition of Witold’s groundbreaking flood research and dedicated outreach to communities across Iowa,” says Harriet Nembhard, dean of the UI College of Engineering. “Because flooding is a nationwide issue, Witold’s work and the work of the Iowa Flood Center is sought after by governments and agencies from across the country who know that this expertise can benefit their communities and protect their local economies.”

Krajewski has served as director of the UI’s Iowa Flood Center since its establishment by the Iowa Legislature in 2009. The center is well known for pioneering the development of the Iowa Flood Information System (IFIS), a Google Maps-based online tool that communicates real-time information about stream levels, flood alerts and forecasts, and hydrologic conditions for the entire state. IFIS is used by emergency responders, community leaders and decision-makers, state and federal agencies, and home and business owners. To date, it has been accessed by more than 3.5 million users. Under Krajewski’s leadership, IFC’s technical expertise has helped bring more than $100 million of external funding to the state of Iowa to address flooding and water resource concerns at the watershed scale.

“The environment at the University of Iowa and within IIHR nurtures independent thought and creative ideas. This is a special place,” says Krajewski. “Membership into NAE is an honor and a responsibility.”

Krajewski holds the Rose and Joseph Summers Chair in Water Resources Engineering. He is one of the world’s most respected experts in rainfall monitoring and forecasting using radar and satellite remote-sensing. His research in hydrometeorology, remote-sensing, and water resources engineering has resulted in more than 250 journal publications and has enriched the education of the dozens of UI graduate students with whom he has worked and collaborated. Communicating accurate, scientific information about floods to all Iowans is one of Krajewski’s priorities, with the goal of protecting lives and enhancing Iowa’s economic vitality and quality of life.
Army Maj. Melissa Elledge knows first-hand the pains of wearing ill-fitting, oversized armor vest plates and other personal protective equipment (PPE) after 13 years of service.

Metal digging into your body, loss of circulation, not being able to turn around, or feeling like a "little turtle" when trying to get up with cumbersome equipment on your back have been common experiences for her and other smaller-stature soldiers, the self-described 5-foot-3 assistant product manager with Program Executive Office (PEO) Soldier said.

Now, testing new equipment and systems designed for women and smaller-sized men at Joint Base Lewis-McChord in Washington, she said she can’t hide her excitement at the feel and maneuverability, emphasizing her points with “unreal” and “in awe.”

“The kit I am wearing for the very first time in my 13 years of service, I’m wearing an extra small, short vest,” Elledge said during the 2020 Iowa Virtual Human Summit. “I can sit down for an hour and stand back up and feel my legs because I don’t have plates sitting on my legs. The fact that this equipment is available to me, I mean, just from a personal perspective, I’m in awe as much as these soldiers.”

Stakeholders in the military and other areas of the Department of Defense, Department of Homeland Security, private industry, and academic research recognize the need for developing better-fitting body armor and PPE not just for soldiers, but for women and smaller-stature men in a variety of dangerous fields.

This need and how virtual technology—including digital twins developed at University of Iowa Technology Institute (ITI)—can be leveraged to meet it was the focus of ITI’s Aug. 2020 summit, hosted virtually.

“At the end of the day, what we are trying to do is reduce prototype development, save time, save a lot of resources — time and money — and save lives,” said Karim Malek, ITI director.
Malek said ITI technology is finally mature enough to solve real-world problems. ITI’s digital twins—Santos, a physics- and physiology-based digital human model at the forefront of ITI research, and companion, Sophia—are capable of predicting physical human behavior without prerecorded data.

Sen. Joni Ernst (Iowa), the first female combat veteran elected to the Senate, shared her personal experiences and observations about the safety risks during the Summit.

The Iowa Republican and retired National Guard officer was among a bipartisan coalition of lawmakers to introduce the Female Body Armor Modernization Act and include similar language in the 2021 National Defense Authorization Act. She said she is proud ITI is part of the solution.

“There’s so many applications you can use your modeling that just goes light years beyond where we have been before,” she said, recounting when she commanded trucks in which cabs sat over engines, creating excruciating heat for soldiers. “Doing modeling and behavioral analysis, taking the heat coming from an engine below you, 142-degree Fahrenheit heat outside the vehicle, no air-conditioning.”

The U.S. Army has added at least eight different sizes to its repertoire of PPE over the years, but officials acknowledged more work remains to allow soldiers to perform duties without compromising safety or risking injury.

“One size does not fit all,” said Doug Tamilio, director of the Army Natick Soldier Research, Development, and Engineering Center, or Soldier Center, in Natick, Mass. “We could do better for females. It’s not necessarily the shot on the body armor. It’s the after-effects of that shot, that blast mitigation, what happens afterwards. So, if the armor is not conformed to the body properly and there are spaces within there, that can cause problems.”

Santos could help the Army as it applies high-fidelity avatars to research and development, particularly in medical research, Tamilio said. The new $50 million, 80,000 square foot Soldier and Squad Performance Research Institute with a combat maneuverability lab in Natick will invite collaboration between military research, academia, and industry, he says.

Industry leaders provided updates on their technology and product development.

A supplier to multiple military outfits and organizations, Hardwire Body Armor, of Pocomoke City, Md., is an industry leader in the production of extremely lightweight soft body armor. Hardwire and the UI have worked together to understand how even more weight can be removed from body armor and how armor interacts with soldiers, Hardwire CEO George C. Tunis III said.

Using motion capture technology, including stretch sensors originally purposed for the movie industry, UI and Hardwire researched armor motion relative to the body, body motion relative to the armor, and the amount armor moves while the body is in motion.

“For too long, PPE came in ‘one size fits most’ and typically was designed for the average male,” said Travis Klopfenstein, ITI executive director for programs. “Performing strenuous and mission-critical tasks with ill-fitting PPE can lead to significant discomfort, pain, and injury.”

A bipartisan coalition of lawmakers is pushing for federal action to address the PPE gap, but analysis of the problem is limited, and testing and validating new designs could still take years.

“One size does not fit all.”

DOUG TAMILIO, DIRECTOR, ARMY NATICK SOLDIER RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
side-by-side with faculty researchers analyzing the transmission of COVID-19 on surfaces, Martell Bell reflects on how far his academic journey has taken him. Bell is a PhD student in the Department of Mechanical Engineering who came to the University of Iowa in 2015 as an undergraduate from Robbins, Ill. Now into the first year of his graduate work, Bell is conducting groundbreaking research, serves on the college’s Diversity, Equity, and Inclusion Council, and teaches as an assistant in undergraduate courses.

“Like many undergraduates, it took me a couple of years to really find my place in engineering,” said Bell. “As a first-generation student, I did not have the family support that many other students have and had to find my path.”

Bell became interested in engineering when, at 10 years old, he began racing radio-controlled cars with his father. In high school, he began taking CAD classes and began competing, ultimately placing third in the region in assembly modeling.

He also took part in the TRIO Upward Bound program in high school. TRIO is a federally funded program that serves first-generation and low-income students with academic instruction, mentoring, and financial literacy. “TRIO provided an outstanding window into the value of an undergraduate degree,” said Bell who now imparts his own college experience to students as he works alongside UI TRIO as a mentor to future college students.

As he entered the second half of his undergraduate degree, Bell found that he excelled at both teaching and conducting research. Over the last five semesters, he taught more than 130 students in three courses - Design for Manufacturing (DFM), Modern Robotics and Automation, and Manufacturing Processes. To further explore the possibilities that engineering has to offer, he joined a research project developing orthopedic surgery simulators used for resident training. Combining his teaching and research experiences, during his senior year Bell launched the iGNITE Engineering Success Conference, bringing in more than 60 students from three schools from across the state of Iowa, introducing them to STEM fields through emerging technologies. Bell would go on to earn the Luther H. Smith Honorable Service Award, the Engineer and Something More Award, and the Most Outstanding Senior of the Year Award, all three from the College of Engineering.

Bell’s graduate work is at the cutting edge of materials science and mechanical engineering utilizing laser surface processing. Not only is he involved in the COVID-19 transmission project, but
he is also considering dissertation topics such as developing new technologies for anti-icing on aircraft wings and producing low-friction surfaces for engine components, which will improve fuel efficiency.

“For the COVID-19 transmission project, Martell first designed and assembled an experimental chamber for virus-containing droplet drying experiments on engineered surfaces. Then he performed a series of surface droplet drying process experiments with a good control of environmental factors including temperature and humidity,” said Hongtao Ding, associate professor of mechanical engineering and Bell’s advisor. “The experimental results will help establish a relationship between the evaporation rates of virus-containing droplets and surfaces with various conditions.”

Bell remains active in TRIO, the National Society of Black Engineers, the UI Center for the Integration of Teaching and Learning, and the College’s Diversity, Equity, and Inclusion Council and also held the second iGNITE conference in April 2021. He is also an educational consultant at 7th University, a Chicago-based group focused on mentoring, youth development, student support services, and civic education for college-bound and non-college-bound students. Recently, he was awarded the prestigious Lulu Merle Johnson Fellowship from the UI Graduate College, which provides five years of financial support and mentorship to the UI’s most accomplished underrepresented minority doctoral students.

“I am eager to continue my research program, which will have a direct impact on advances in human health and the development of innovative transportation technologies,” said Bell. “I hope that my experience will translate for younger students who are considering pursuing engineering as a career.”
Jim Ashton (BS 64) arrived at MIT for graduate school, he quickly found that it was his undergraduate education from the University of Iowa College of Engineering that set him apart. In those early days of computing, his UI professors saw so much promise in him that after seeing him excel in some of the hardest courses in computing and numerical methods, they asked him to help teach those very same courses—as an undergraduate.

“I don’t believe that I would have been as successful in graduate school or in my career were it not for the UI College of Engineering,” said Jim Ashton. “When I walked into MIT, I was better prepared than my peers who came from some of the top colleges of engineering. I would even say I knew more than some of the professors.”

Bill, George, and Jim Ashton are part of a long line of more than 20 Ashton family members who have attended the UI over nearly 90 years. In fact, Jim and both of his brothers were inducted into the College’s Distinguished Engineering Alumni Academy, and to date are the only family to have three members in this elite and exclusive group.

The first set of three Ashton brothers to graduate with engineering degrees from the UI included George (BE 1923), Ned (BE 25, MS 26), and Frank (BSCE 30). Ned would go on to become a UI professor of civil engineering from 1943-1957.

“Our father, Frank Ashton, was chief engineer in the Army Corps of Engineers,” said Jim Ashton. “He always said it was the care and interest that his professors showed in him that made him a successful engineer.”

This theme of outstanding support from College of Engineering faculty and staff is echoed by Bill Ashton (BSCE 62, MS 63), one of three in the second generation of Ashton brothers. To this day, he remembers the names of staff in the Dean’s Office who looked after him and faculty members who helped him prioritize his education.

“When I was at Iowa, there was a unique and close relationship between students and faculty, staff, and administrators,” said Bill Ashton. “We were not just numbers. We were as important to them as they were to us, and I am convinced that relationships like these don’t exist in many other colleges of engineering.”

Bill Ashton notes that he received an outstanding technical education at Iowa, but his experience was about much more than the hard science that characterizes engineering. Ashton is convinced that exposure to concepts such as engineering ethics sets students at Iowa apart from their peers at other institutions. “In many ways, you can’t learn about...
ethics from a textbook,” said Bill Ashton. “We related to engineering through life and experiences, which ought to be fundamental for every engineering graduate.”

Jim and Bill Ashton, along with their brother George, remain connected to the college and university. Jim and Bill were outstanding UI cross country runners, and their leadership gift to the UI led to the naming of the Ashton Cross Country Course. Their support has also led to the creation of three named professorships in the College of Engineering – the William D. Ashton Professorship in Civil Engineering; the George D. Ashton Professorship in Hydroscience and Engineering; and the James E. Ashton Professorship in Engineering. There is also a named space in the Seamans Center recognizing James E. Ashton and Glenda Stephens Ashton.

The brothers intend to stay a part of the College of Engineering for many years to come. “Our Iowa education propelled us into the careers we have today,” said Jim Ashton. “Being part of an engineering family, an Iowa engineering family, is fundamental to who we are, and we want to continue to help the college and university thrive for years to come,” said Bill Ashton.
UI engineers and neurologists develop a highly efficient algorithm that can detect Parkinson’s Disease through EEG data

A team led by Soura Dasgupta, F. Wendell Miller Distinguished Professor in the Department of Electrical and Computer Engineering, and Nandakumar Narayanan, Juanita J. Bartlett Professor in Neurology Research at the University of Iowa, has developed a computational approach to diagnosing Parkinson’s Disease by using data from electroencephalogram tests, commonly referred to as EEGs. First piloted on rodents, the diagnosis can come with as little as two minutes of EEG data. Their proposed approach is highly efficient and capable of diagnosing PD in real time.

“Parkinson’s is a debilitating and often devastating disease,” said Dasgupta. “Our ability to diagnose it quickly and reliably through EEG data will undoubtedly help patients and their families.”

The algorithm’s results are 85% accurate, outperforming other existing testing methods and the average clinical diagnostic accuracy. The algorithm is orders of magnitude faster than other state-of-the-art approaches and shows reliable and robust performance in simulated real-time scenarios. The approach may prove very useful in initiating and guiding Adaptive Deep Brain Stimulation, which is being studied for combating Parkinson’s symptoms. “One of the most promising aspects of this algorithm is that it is incredibly efficient,” said Dasgupta. “We believe that it will work well as a real-time application or on cloud-based systems.”

The team included: Md Fahim Anjum, a PhD student in the UI Department of Electrical Engineering; James Cavanagh, associate professor of psychology at the University of New Mexico; Arun Singh, assistant professor of basic biomedical sciences at the University of South Dakota; and Raghu Mudumbai, UI associate professor of electrical and computer engineering. Dasgupta credited Anjum in particular for developing an innovative protocol for training the algorithm.

The team’s results, published in the paper, “Linear predictive coding distinguishes spectral EEG features of Parkinson’s disease,” can be found in Parkinsonism & Related Disorders, the flagship clinical journal on Parkinson’s disease.
Three University of Iowa faculty members named IEEE Fellows

Faculty members from the University of Iowa’s College of Engineering and the Roy J. and Lucille A. Carver College of Medicine were named IEEE Fellows, the highest grade of IEEE membership recognized by the technical community as a prestigious honor and an important career achievement.

**Michael Abramoff, MD, PhD** was recognized for his “contributions to the application of artificial intelligence methods in diabetic retinopathy.” Abramoff is the Robert C. Watzke, MD, Professor of Ophthalmology and Visual Sciences, a professor of electrical and computer engineering, and a professor of biomedical engineering. His research on neuroscience, image analysis, machine learning, and diabetes complications led to the creation of the first-ever autonomous artificial intelligence approved by the FDA, which makes a medical diagnosis with human oversight. His research is primarily focused on the ethical and legal aspects of autonomous AI, while the company he founded and leads, IDx, focuses on improving patient outcomes through low-cost, point-of-care, autonomous diagnostics and therapeutics for diabetic retinopathy and other diseases.

**Joseph Reinhardt, PhD** was recognized for his “contributions to medical image processing and analysis.” Reinhardt is professor and chair of the Roy J. Carver Department of Biomedical Engineering, is the Roy J. Carver Chair of Biomedical Engineering, and holds an additional appointment as a professor of radiology. His lab focuses on the use of advanced imaging techniques and image processing and analysis methods to study problems at the interfaces between engineering, medicine, and biology, with a particular emphasis on pulmonary image analysis. He is the image analysis group leader within the University of Iowa’s Institute for Biomedical Imaging. Reinhardt is also co-founder of a local medical imaging software company, VIDA Diagnostics.

**Punam Saha, PhD** was recognized for his “contributions to quantitative bone microstructural imaging and analysis.” Saha is a professor of electrical and computer engineering and radiology. His seminal works enabled segmentation and characterization of individual trabecular plates and rods from in vivo 3D bone imaging, which relate to bone strength and fracture risk. His methods are used as standard techniques for trabecular bone microarchitectural analysis by various leading research and clinical groups. His research interests include image processing and pattern recognition, quantitative medical imaging, musculoskeletal and pulmonary imaging, image restoration and segmentation, digital topology, geometry, and shape and scale.

The IEEE Grade of Fellow is conferred by the IEEE Board of Directors upon a person with an outstanding record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year cannot exceed one-tenth of one percent of the total voting membership.

### ABOUT IEEE

The IEEE is the world’s leading professional association for advancing technology for humanity. Through its 400,000-plus members in 160 countries, the association is a leading authority on a wide variety of areas ranging from aerospace systems, computers and telecommunications to biomedical engineering, electric power and consumer electronics.

Dedicated to the advancement of technology, the IEEE publishes 30 percent of the world’s literature in the electrical and electronics engineering and computer science fields and has developed more than 1300 active industry standards. The association also sponsors or co-sponsors nearly 1700 international technical conferences each year.
ENGINEERING FOR HUMA
developing new chemical sprays to treat wounds, to designing aerosols for better delivery, to infusing engineering ethics into the undergraduate curriculum, Jennifer Fiegel’s research and teaching impact is wide-ranging. Fiegel is an associate professor of chemical and biochemical engineering whose work is enhancing human health through the development of new compounds for drug delivery and pain treatment while at the same time producing thoughtful and ethical engineers.

“Our students must learn the science of engineering,” said Fiegel, “but they must also understand the ethical choices that are critical at every step of the engineering process. Their choices as professional engineers will have real-world consequences, which must factor into their decision making.”

Fiegel’s research program has focused on developing better ways to treat and prevent infections, especially those in the lungs and, more recently, those that come from open wounds, through the application of medicines. Her lab has produced alternatives to the use of ointments that must be applied multiple times a day by creating a sprayable gel that can be applied to the skin. This thermo-reversible hydrogel liquid becomes a gel when applied and can be used to treat burns and alleviate pain. Fiegel has collaborated with faculty members in the College of Pharmacy and sees opportunities to apply this research in both civilian and military settings.

Additionally, Fiegel’s lab has produced synthetic polymers that can be used to target drugs more precisely and deliver these drugs more efficiently. Just as bacteria and viruses can use receptors to attach to cells, these synthetic polymers can be similarly used to target drugs. Fiegel’s lab has also completed a project that focused on designing aerosols for better delivery, a project that is especially important during the COVID-19 pandemic.

Breakthroughs in the lab are not Fiegel’s only passion, as evidenced by her work teaching Engineering Problem Solving, the course where she has infused ethics into the curriculum. Her students spend part of the course working through a game in which they choose their own path when faced with engineering scenarios that require an ethical decision, such as a biomedical device failure or accidents caused by an automotive design. The students not only make their own ethical choices but also play a game of chance where outside influences can determine the final decision.

Fiegel collaborated on this ethics work with Beth Rundlett, associate professor of practice in chemical and biochemical engineering, and Allen Bradley, chair of the Department of Civil and Environmental Engineering. They are currently writing a paper for the American Society for Engineering Education to be delivered at an upcoming conference.

“Engineering decisions are not made in isolation,” said Fiegel. “Design choices are made but also intersect with corporate, legal, and PR influences. How our graduates deal with these consequences in the real world can have a direct impact on human lives. This approach must be part of every engineering student’s education.”

“[Our students’] choices as professional engineers will have real-world consequences, which must factor into their decision making.”

Jennifer Fiegel, Associate Professor of Chemical and Biochemical Engineering
IOWA SUPERFUND RESEARCH PROGRAM RECEIVES $11.4M FROM NIH

“The breadth of the research underway at the University of Iowa is what made our group such a strong candidate for this support.”

KERI HORNBUCKLE, DONALD E. BENTLY PROFESSOR OF ENGINEERING, AND ISRP’S PRINCIPAL INVESTIGATOR

Iowa Superfund Research Program (ISRP), a University of Iowa research group started in 2006 that is a leader in the study of human exposure to polychlorinated biphenyls (PCBs), has received a highly competitive five-year, $11.4 million grant renewal from the National Institutes of Health (NIH) announced in March 2020. ISRP received $2.4 million for the first year of the renewal.

“Airborne PCBs: Sources, Exposures, Toxicities, Remediation” is the latest phase of the project, which focuses on the airborne threats posed by PCBs by identifying the ways in which people are exposed, analyzing measurable levels of toxicity, and developing efforts to remediate PCBs already present in natural environments and manufactured structures.

“The Iowa Superfund Research Program is the only program funded by the NIH that focuses on airborne PCBs,” says Keri Hornbuckle, the Donald E. Bently Professor of Engineering in the UI Department of Civil and Environmental Engineering and the project’s principal investigator. “Our research is the result of interdisciplinary collaborations that cover the breadth of the PCB problem—assessing issues related to exposure; identifying PCB sources and stopping continued release; and developing the methods that can be used to remediate spaces and surfaces.”

The use of PCBs as additives in fluids was pervasive in many engineering applications throughout much of the 20th century. Although the Environmental Protection Agency banned the sale of PCBs in 1979, people continue to be exposed to PCBs because the compounds decay very slowly and are produced as byproducts of chemical manufacturing, including the brightly colored pigments used to tint paint. In addition, some PCB products installed before the 1979 ban still may be in use. Some of the products identified by the EPA as potentially containing PCBs include transformers, capacitors, and other electrical equipment; oil used in motors and hydraulic systems; plastics; thermal insulation material including window-caulking masonry sealants; and adhesives. Because PCBs tend to accumulate in the food chain, they pose a particular threat to human and animal health.

The ISRP will use this continued support to address PCBs through five research projects and six support cores. ISRP research includes:

- Studying the risk factors for adverse neurodevelopmental outcomes during adolescence;
- Understanding the role of airborne PCBs in adipose (fat tissue) function, adipogenesis (the formation of fat cells), and metabolic syndrome (which could increase the risk of heart disease, stroke, and type 2 diabetes);
- Determining the sources of airborne PCBs;
- Measuring exposure to airborne PCBs in schools; and
- Developing novel ways to mitigate these emissions.

Support roles include the Community Engagement Core, which assists communities and schools directly affected by airborne PCBs, and the Research Experience and Training Coordination Core (RETC). The RETC will train 15 to 20 UI graduate and undergraduate students on PCB research, community engagement, research translation, and data management and analysis.
“The breadth of the research underway at the University of Iowa is what made our group such an ideal candidate for this support,” says Hornbuckle. “We have groundbreaking engineers who are collaborating with scientists and health professionals to develop research and solutions that will improve quality of life and limit adverse health impact for communities everywhere.”

“Dr. Hornbuckle and the rest of the Iowa Superfund Research Program team represent some of the top PCB experts in the world,” says Gabriele Villarini, director of the UI’s IIHR—Hydroscience & Engineering. “We are thrilled that NIH will continue to fund this critical work for an additional five years.”
November 2020, the College of Engineering launched its Distinguished Speaker Series. The series focuses on bringing in esteemed speakers who can provide their perspective on innovation in engineering education, the transformative power of engineering research, and the intersection between engineering and ethics, social justice, and equity.

“Learning from leaders in engineering education and research makes us better teachers, researchers, and members of the engineering community,” said Harriet Nembhard, dean of the College of Engineering. “We launched this series at a pivotal moment in higher education as the COVID-19 pandemic has upended our academic world and the pressing need to address systemic racism in higher education has been brought to the forefront. Through this speaker series, we are afforded the opportunity to hear from trailblazing academics and scientists who have themselves seen tremendous transformations and upheavals in engineering industries and higher education.”

HARRIET NEMBHAND, DEAN OF THE COLLEGE OF ENGINEERING

The inaugural lecture was delivered by Richard K. Miller, former dean of the UI College of Engineering and president emeritus of Olin College. He was appointed president and first employee of Olin College of Engineering in 1999 where he served as the college’s
founding president until June 2020. In September 2020, he joined MIT as the Jerome C. Hunsaker Visiting Professor of Aerospace Systems.

Prior to joining Olin, he served as dean of engineering at the University of Iowa, associate dean of engineering at USC in Los Angeles, and assistant professor of engineering at UCSB in Santa Barbara. With a background in applied mechanics and current interests in innovation in higher education, Miller is the author of more than 100 peer-reviewed journal articles and other technical publications.

In his seminar, “Lessons from 20 years of Experimentation at Olin College,” Miller commented that “the future is focused on the innovation economy where what matters most is original ideas and insights that come from the students. It isn’t clear yet what the best format is for teaching innovation. It may depend more on peer learning, intrinsic motivation and design thinking than having a PhD at the front of the room.”

The second lecture in the series was delivered in March 2021 by Lilia Abron, Ph.D., PE, BCEE, NAE, Dist.M.ASCE, who graduated with a doctorate in chemical engineering from the UI in 1971. Abron was the first African American woman in the nation, and the third woman at the UI, to receive a doctorate in chemical engineering. She would go on to become the founder and CEO of PEER Consultants, PC, an environmental consulting firm headquartered in Washington DC. The firm has grown to include branch offices in three major cities throughout the United States.

Abron is currently the president of the American Academy of Environmental Engineers & Scientists (AAEES) and, in October 2020, was elected to the National Academy of Engineering. She is also the president and founder of PEER Africa (Pty) Ltd., an innovative design-build, sustainable development company with offices in Johannesburg and Cape Town, South Africa.

In her “Keynote Conversation” seminar, Abron noted that underrepresented minority women face a “double-bind” in engineering as assumptions and preconceptions about racial and gender identities are imposed upon them. She recounted some of the challenges and conflicts she faced throughout her career and attributed her success as an entrepreneur and business owner to her “positive, strong sense of self” and her loyal team.
Amanda Mikhail inducted into the Distinguished Engineering Alumni Academy

Amanda Mikhail (BSE ME 99) began her career at IBM in 1999 as an engineer in hardware development. In 2002 she was promoted to project lead, where she managed a $1.5M budget and led multiple teams through expedient program delivery. Mikhail is an inventor on more than 25 US Patents and received an IBM Master Inventor award: at the time, she was only the second female Master Inventor in IBM Rochester’s 50+ year history. She was also the recipient of the Outstanding Technical Achievement award. In 2010, she became a product development manager where she led teams across many US states through significant product development commitments.

In 2014, Mikhail left IBM to join Mayo Clinic. She currently serves as the administrative lead for research for the Mayo Clinic Department of Medicine addressing the needs of patients through strategic discovery, translation, and application of innovations. Mikhail served as the co-chair of Mayo’s COVID-19 Research Task Force and currently co-leads the DERIVE initiative, aligning Mayo Clinic Research to advance innovations in Mayo’s patient-facing practice. She has a strong track record of employee development and commitment to diversity.

Mikhail has been a devoted member of our College of Engineering Advisory Board since 2005. She previously helped transform the undergraduate curriculum to better serve student development and overall success. She currently co-chairs the Industry Strategic Partnerships committee to strengthen our industry outreach. Amanda Mikhail was inducted into the College of Engineering’s Distinguished Engineering Alumni Academy (DEAA) at the Fall 2020 Commencement Ceremony, at which she gave the charge to the graduating class. The DEAA was created to honor University of Iowa engineering alumni for their personal contribution toward engineering achievement, leadership, and service to the profession and to society.

In her charge to the graduating class, Mikhail commented on what sets our students apart at the end of their academic journey. “At Iowa, you learn how to think critically, across competing demands and requirements,” said Mikhail. “You learned how to work through problems that had no clear answer, and you learned how to build teams and communicate with confidence and humility.”

Other recent DEAA inductees

In Fall 2019, Sharon K. Tinker (BSChE 80) was inducted into the DEAA. Throughout a career spanning nearly 35 years, Tinker has been a leader in her field, performing instrumental process safety work at Exxon and then ExxonMobil. Tinker has improved workplace safety at chemical plants and refineries across the United States and around the world.

In Spring 2020, Kristi Bauerly (BSE ISE 2002) was inducted into the DEAA. As a human factors engineer with Apple for more than 14 years, Bauerly’s impact can be felt by almost anyone who has held an Apple device. Her work has driven innovations in personal technology and transformed the ways in which we interact, express ourselves, and share our stories.
GRADUATION BY THE NUMBERS
SPRING 2021

5 CANDIDATES GRADUATING WITH A SECOND MAJOR

134 CANDIDATES GRADUATING WITH A MINOR

18 CANDIDATES GRADUATING WITH A CERTIFICATE

35 CANDIDATES GRADUATING WITH UNIVERSITY HONORS

9 CANDIDATES GRADUATING WITH ENGINEERING HONORS

48 CANDIDATES GRADUATING WITH DISTINCTION
Steven Coutteau (20BSE) is an electrophysiology associate with Abbott in Ann Arbor, MI.

Jack Crothers (20BSE) is a civil engineer I with CivilTech in Itasca, IL.

Juliana Danesi Ruiz (20BSE) (above), Camilla Tabasso (20BSE), and Dylan Walters (20BSE) will pursue PhDs in mechanical engineering at the University of Iowa.

Hannah Day (20BSE, 20CER) is a hardware product engineer with Eaton Corp in Milwaukee, WI.

Amber Decker (20BSE) is a blending chemical process engineer with Bayer Crop Science in Muscatine, IA.

Chantal DeGroat (20BSE) is a field engineer with Mortenson Construction in Seattle, WA.

Charles Dickinson (20BSE), Zane Johnson (20BSE), and Brandon Murphy (20BSE) will pursue a Master of Science in industrial engineering at the University of Iowa.

Carly Donahue (20BSE) will pursue a PhD at the University of Minnesota.

Hunter Duncan (20BSE) will pursue a Doctor of Dental Surgery (DDS) at the University of Iowa.

Rebecca Ewing (20BSE), Calvin Hynek (20BSE), Nicole Liljestrand (20BSE, 20CER), and Eric Schaffer (20BSE) will pursue a Master of Science in civil and environmental engineering at the University of Iowa.

Nicholas Fallon (20BSE) is a software consultant with Pariveda Solutions in Houston, TX.

Stjepan Filić (20BSE), Colton Miller (20BSE), Kevin Steele (20BSE), and Sarah Wehrkamp (20BSE) will pursue a Master of Science in electrical and computer engineering at the University of Iowa.

Paul Flanders (20BSE) is a process engineer with Procter and Gamble in Iowa City, IA.

Kyle Folken (20BSE, 20CER) is an energy consultant I with Sargent & Lundy in Chicago, IL.

Morgan Gagnon (20BSE) is an Accenture Technology technical platform analyst with Accenture in Minneapolis, MN.

Dylan Gardner (20BSE) is an associate consultant with Redstone Content Solutions in Davenport, IA.

Haley Gion (20BSE) is a technical solutions engineer with Epic in Verona, WI.

Nevena Glavas (20BSE) will pursue a Doctor of Pharmacy at the University of Iowa.

Sarah Graham (20BSE) is a software engineer with Principal Financial in Des Moines, IA.

Lauren Gray (20BSE) is an embedded software engineer with United Launch Alliance in Centennial, CO.

Enzo Guazzo Rizzo (20BSE) is a management trainee with JBS in Marshalltown, IA.

Meghan Hackett (20BSE) has joined John Deere’s Manufacturing Engineering Development Program in Waterloo, IA.

Ben Hageman (20BSE) has joined John Deere’s Product Engineering Development Program in Moline, IL.

Gabrielle Haman (20BSE) has been commissioned as a second lieutenant in the U.S. Air Force as a bioenvironmental engineer.

Alec Hanson (20BSE) will attend the University of Iowa Carver College of Medicine.

Contessa Harold (20BSE) will pursue a Master of Science in civil and environmental engineering at the University of Iowa and will attend Clemson University to pursue a Master of Architecture in 2021.

Sage Hassel (20BSE) is a software engineering analyst with Accenture in Austin, TX.

Loden Henning (20BSE) is a systems engineer with SpaceX in Seattle, WA.

Jared Hill (20BSE) will pursue a Master of Science in clinical anatomy at the University of Iowa.

Christopher Holland (20BSE) is a Project Engineer with RMH Systems in Des Moines, IA.

Zachary Ingram (20BSE) is a research and development engineer with Medical Murray in North Barrington, IL.

Nathan Jarvey (20BSE) will pursue a PhD at the University of Colorado – Boulder.

Jacob Johnson (20BSE) is a nuclear officer with the US Navy.

Mohamed Karar (20BSE) is an investment management analyst with Goldman Sachs in San Francisco, CA.

Khaled Kayali (20BSE) is an R&D Engineer with Medical Murray in North Barrington, IL.

Zain Khan (20BSE, 20BS) will pursue a PhD at Columbia University.

Emily King (20BSE) is entering a two-year recent graduate rotational program with Western Federal Lands in Vancouver, WA.

Amelia Klarch (20BSE) is a process improvement engineer with University of Iowa Hospitals & Clinics.

Anthony Kluch (20BSE) is a chemical engineer with Honeywell UOP in Des Plaines, IL.

Paulina Kroczyk (20BSE, 20CER) is a power systems engineer with Open Systems International, Inc. in Medina, MN.
Stephanie Krogh (20BSE, 20CER) is an entry-level civil engineer with Shive-Hattery in West Des Moines, IA.

Logan Ladowski (20BSE) is a project engineer with Navistar, Inc. in Lisle, IL.

Adam Lev (20BSE, 20CER) is an engineer in training with Stanley Consultants in Chicago, IL.

Michael Leyden (20BSE) will pursue a PhD at the University of Minnesota Twin Cities.

Ryan Long (20BSE) is a product specialist with Marion Process Solutions in Marion, IA.

Katie Longo (20BSE) is a project engineer with Honeywell Aerospace in Tempe, AZ.

Andrew Loth (20BSE) is an engineer in training with Stanley Consultants in Muscatine, IA.

Clara Lyden (20BSE) will join Accenture as a technical analyst in Minneapolis, MN.

Jacob Malek (20BSE) is a process technology engineer with Roquette America in Keokuk, IA.

Jonah Marks (20BSE) will pursue a PhD in chemical and biochemical engineering at the University of Iowa.

Russell Martin (20BSE) will pursue a PhD in mechanical engineering at Stanford University.

Alexandra Martinez (20BSE) is a project engineer with Austin Bridge and Road in Irving, TX.

Patrick Maston (20BSE) is a construction engineer with HR Green in Cedar Rapids, IA.

Ryan McDonough (20BSE) is an associate engineer with American Buildings Company in Columbus, GA.

Michael Miceli (20BSE) is a technology platform analyst with Accenture in Chicago, IL.

Renee Mittelberg (20BSE) is an associate manufacturing engineer with Medical Murray in Lake Zurich, IL.

Taylor Moenk (20BSE) is a manufacturing engineer I with Boston Scientific in Maple Grove, MN.

Abbie Moore (20BSE) is attending Air Force Undergraduate Pilot Training following graduation.

Nicholas Morgan (20BSE) is a founding entry-level rotational engineer with General Motors in Bedford, IN.

Daniel Murphy (20BSE) is a civil engineer in training with Kimley-Horn & Associates in Oklahoma City, OK.

Samuel Murphy (20BSE) and Benjamin Woida Clark (20BSE, 20CER) will pursue a Master of Science in mechanical engineering at the University of Iowa.

Annie Najafi (20BSE) will pursue a PhD at Texas A&M University.

Nicklaus Nelson (20BSE) is a structural engineer with Apex Structural in Cedar Rapids, IA.

Jacob Nishimura (20BA, 20BSE) was a virtual software development engineer intern for Amazon. He is currently pursuing a Master of Science in electrical and computer engineering at the University of Iowa.

Maggie Norland (20BSE) is a supply chain engineer associate with PepsiCo in Chicago, IL.

Kate O’Brien (20BSE) is a software engineer with VIDA Diagnostics in Edina, MN.

Michael Ojemudia (20BSE) is a cornerstone with the Denver Broncos.

Michael Pasteris (20BSE) is a supply chain quality engineer with American Buildings Company in Columbus, GA.

Morgan Ross (20BSE) is a supply chain quality engineer with Collins Aerospace in Burlington, VT.

James Rowden (20BSE) is a mechanical engineer with AMSOIC Engineering in Downers Grove, IL.

Allison Rowe (20BSE) is a mechanical engineer with Design Engineers in Madison, WI.

Olivia Sandvold (20BSE) will pursue a PhD at the University of Pennsylvania.

Blane Schneider (20BSE) is a field engineer with Mortensen Construction in Washington, DC.

Rebecca Schwartzburg (20BSE, 20CER) is a software consultant with Pariveda Solutions in Houston, TX.

Marc Shepherd (20BSE) is a software engineer with Hy-Vee, Inc. in West Des Moines.

Aaron Silva Trenkle (20BSE) will pursue a PhD at Georgia Institute of Technology and Emory University.

Matthew Situmeang (20BSE) is a design engineer I with CIVCO Medical Solutions in Coralville, IA.

Zoé Slettehaug (20BSE, 20CER) is a product engineer I with CIVCO Medical Solutions in Coralville, IA.

Renee Matthew (20BSE) is a product engineer I with CIVCO Medical Solutions in Coralville, IA.

Michael Ollinger (20BSE, 20CER) is a field engineer – water services with DGR Solutions in Rock Rapids, IA.

Micael-Ann Wathne (20BSE) is a rotational engineer with Phillips-Medisize in Menomonie, WI.

Kyle Wersinger (20BSE) is a consultant engineer with FM Global in St. Louis.

Cody Wilson (20BSE) is a sustainability engineer with PepsiCo – Quaker Oats in Cedar Rapids, IA.

David Wu (20BSE) is a project electrical engineer with Lutron Electronics in Boston, MA.

The following graduates are working with Collins Aerospace in Cedar Rapids, IA:

- Ben Atzen (20BSE)
- Alexander Dalziel (20BSE, 20CER)
- Spencer Duball (20BSE)
- Megan England (20BSE)
- Bryan Fogerty (20BSE)
- Amanda Ollinger (20BSE)
- Alan Rolla (20BSE)
- Liana Suleiman (20BSE)
- Sarah Wehrkamp (20BSE)
Cooper Bell (19BSE) is a software consultant with Pariveda Solutions in Chicago, IL.

Andrea Birtles (19BSE) is a supply chain associate with PepsiCo – Quaker Oats in Cedar Rapids, IA.

Abdalrhman Elgaali (19BSE) is a research assistant for the Industrial and Systems Engineering Department at the University of Iowa.

Jenna Garbars (19BSE) is a technology platform analyst with Accenture in Chicago, IL.

Benjamin Gravunder (19BSE) is a sales engineer with Foxconn in Milwaukee, WI.

Haley Hawbaker (19BSE) is an industrial engineer with Collins Aerospace in Cedar Rapids, IA.

Emerson Jordan-Wood (19BSE) is a project lead with SBP in Houston, TX.

Jeffrey Kardell (19BSE) is a sales applications engineer with KEB America in Shakopee, MN.

Karli Noone (19BSE) is a sales engineer with Johnson Controls in Milwaukee, WI.

Corey O’Brien (19BSE) is an applications engineer with Aqua-Aerobic Systems in Loves Park, IL.

Rob Pohren (19BSE) is an engine application engineer with John Deere in Dubuque, IA.

Lauren Rasor (19BSE) is a research and development engineer I with Medical Murray in North Barrington, IL.

Suman Sherwani (19BSE) graduated from The University of Notre Dame with a Masters of Science in finance in 2019.

Michael Wall (12BSE) is now a solar project manager with Continental Energy Solutions in Oakbrook, IL.

Lauren “Lenny” Weber (14BSE) is now a solar project manager with Continental Energy Solutions in Oakbrook, IL.

Jennifer (Misch) Leitsch (00BSE) was named to Assent Compliance’s Top 100 Corporate Social Responsibility Influence Leaders for her work as vice president for corporate responsibility at CBRE.

Kimberly (Sullivan) Sumrak (07BSE), P.E., a civil engineer at Hanson Professional Services Inc.’s Chicago regional office, has been named a 2020 Rising Star in Multidiscipline Engineering by Zweig Group.

Sam Elias (90BSE) was recently promoted to senior director, Americas Go-To-Market Execution at Cisco.

Alexander N. Cartwright (89BSEE, 95PhD) has been named president-elect for the University of Central Florida. He has served as Chancellor for the University of Missouri since August 2017.
1940s
Ralph W. Andres (49BSME)
Kenneth Bratney (48BSCE)
Walter R. Chapman (42BSME)
Kenneth W. Damerow (42BSCE)
John T. Engel (48BSChE, 52BSPh)
Robert S. First (43BSChE)
Donald E. Hall (47BSME)
Elvin E. Herman (42BSEE)
Simon Ince (48MS, 52PhD)
George W. Keyes (48BSCE)
Joseph J. Moyer (49BSEE, 50MS)
Robert C. Newton (49BSCE)
Sadiq M. Niaz (47MS)
Steve Orlich (49BSChE)
Ralph H. Rahe (48BSIE)
Donald K. Schulze (49BSCE)
James R. Swaner (47BSME)
Mark H. Wegener (48BSME)
Richard W. Hradek (56BSME, 58MS)
Howard P. Johnson (54MS)
Martiniano V. Ligon (50MS)
James Schiltz (51BSCE)
Martin W. Leistekow (55BSME, 56MS)
Edward L. Stachovic (53BSME, 72MBA)
Wally G. Storm (58BSME)
Richard H. Kiene (51BSME)
Robert P. Van Dyke (50BSCE, 54MS)
John B. Vesely (54BSCE)
John E. Vondracek (50MS)
James J. Wintrout (59BSME)
Richard A. Wilford (58BSCE)
Richard W. Hradek (56BSME, 58MS)
Howard P. Johnson (54MS)
Marvin E. Kennebeck (54BSCE)
Milt Kopecky (56BA, 58BSME)
Lavern E. Leistekow (55BSME, 56MS)
John P. McDermott (58BSCEE)
Richard V. MacMillan (56BSME)
Alvin H. Miller (59BSCE, 60MS)
George H. Miller (56BSME)
John M. Peterson (59BSEE)
Ellis B. Pickett (50MS)
C. Kenard Roberts (51BSCE, 58BSME)
James Schiltz (51BSCE)
James M. Sealy (58BSME)
Clifford V. Smith (54BSCE)
Charles C. S. Song (56MS)
Edward L. Stachovic (53BSME, 72MBA)
Wally G. Storm (58BSME)
Richard H. Tienmeier (51BSME)
Robert P. Van Dyke (50BSCE, 54MS)
John B. Vesely (54BSCE)
John E. Vondracek (50MS)
James J. Wintrout (59BSME)
Richard A. Wilford (58BSCE)
Michael A. Hanson (62BSCE)
Robert A. Hartwig, Sr. (62BSCEE)
Elmont E. Hollingsworth (61BSME)
Robert J. Huewe (66BSIE)
Thomas S. Kaung (66MS)
Neil P. Kult (61BSME)
James G. Leibold (62BSME)
Claude Lindeman (60BSME)
James M. Macek (67BSIE)
Irwin E. Magerkurt (60BSME, 62MS)
Nicolaola (Pebenito) Mancke (66PhD)
John T. Mathes (68BSIE)
Kenneth C. Miller (68BSCE)
William P. Miltenberger (60BSIE)
Frank S. Pung (60BSCE)
Martin Pauke (65BSCE)
Richard H. Ralston (60BSME)
Richard L. Schrader (68BSCE)
John A. Sealy (64BSIE)
Marlyn W. Sterk (64BSME, 65MS)
Stanley Q. Swinton (67BSCE)
Matthew T. Szykowny (65BSCE)
John D. Teasdale (60MS)
Lowell Titus (68MS)
Phillip A. Updike (62BSCE)
Thomas J. Van Hon (60BSME)
David R. Waugh (61BSIE)
William J. Williams (61MS, 63PhD)
Daryl M. Wilson (61BSME)
Leon R. Zeter (67MS)
Scott C. Macomber (74MS)
Gary Mauritzson (77MS)
Art Petzelka (79BSME)

1950s
Ward L. Akers (59MS)
Bill R. Baker (56BSME, 57MS)
Paul F. Barrett (57BSCE)
David R. Buchanan (58BSCE, 63MS)
Wilbur H. T. Busch (58BSME)
John R. Chadima (54BSIE)
William J. Crawford (58BSCE)
Gary F. Englehorn (59BA, 61BSCE)
Olaf M. Erickson (57MS)
LaVerne W. Flagel (56BSCE)
Wayne J. Fluent (58BSCE)
J. Earl Foster (55MS, 58PhD)
Gene E. Fouke (50BSCE)
Ray A. Fuller (50BSCE)
Mubashir Hasan (54PhD)
Norbert B. Hemesath (59BSCE)
Fredrick E. Anderson (61BSCE)
Thomas A. Barta (62MS)
Richard H. Bangert (61BSEE)
Prabir K. Chakraborty (67MS)
Edward F. Chouinard (64MS)
Sei-Jong Chung (69MS, 78PhD)
Robert G. Dubensky (68PhD)
Albert E. Ford (61BA, 63BSCE)
William L. Fry (60BSME)
George J. Galic (66BSCE)
Duane V. Greenfield (60BSCE)

1960s
Ralph W. Hradek (56BSME, 58MS)
Howard P. Johnson (54MS)
Martiniano V. Ligon (50MS)
John P. McDermott (58BSCEE)
Richard V. MacMillan (56BSME)
Alvin H. Miller (59BSCE, 60MS)
George H. Miller (56BSME)
John M. Peterson (59BSEE)
Ellis B. Pickett (50MS)
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James Schiltz (51BSCE)
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Frank S. Pung (60BSCE)
Martin Pauke (65BSCE)
Richard H. Ralston (60BSME)
Richard L. Schrader (68BSCE)
John A. Sealy (64BSIE)
Marlyn W. Sterk (64BSME, 65MS)
Stanley Q. Swinton (67BSCE)
Matthew T. Szykowny (65BSCE)
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Daryl M. Wilson (61BSME)
Leon R. Zeter (67MS)
Scott C. Macomber (74MS)
Gary Mauritzson (77MS)
Art Petzelka (79BSME)

1970s
Asad Asadi (75BSME, 76MS, 87MS)
Javad Ashjaee (73MS, 76MS, 79PhD)
Cecil F. Coombs (70BSCE)
Robert G. Schmitt (89BSE, 90MS, 94PhD)
Kevin P. Canney (94BSE)
Kevin J. Henriksen (92BSE)
Mark A. Saarinen (99MS, 01PhD)
Mark A. Saarinen (99MS, 01PhD)

2000s
Kelly L. Enstrom (08BSE)
Jonathan R. Watson (05BSE)
Clinton A. Tebbs (19BSE, 19CER)

2010s

Save the Date!

HOMECOMING WEEKEND
October 15-17, 2021

For more information → engineering.uiowa.edu