Spring 2026

MESSENGER

MECHANICAL ENGINEERING | UNIVERSITY *of* WASHINGTON

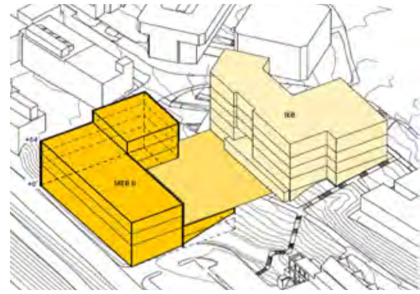
Building batteries better, pages 8-9

Momentum in ME

It's an exciting time to be in ME, as demand for our programs skyrockets. Our department is advancing in two multidisciplinary areas where the UW is also investing for the future: medical care and advanced manufacturing. In this issue, you'll read about ME and UW Medicine researchers partnering to improve image-guided surgeries, along with battery manufacturing collaborations that connect researchers and industry.

Behind our expanding research and educational programs are graduate students who strengthen our department as researchers, mentors and future leaders in industry and academia. With state and federal funding under pressure, the ME Fellowship Fund (bit.ly/ME-fellowship) is one of the most direct ways to support their training and ensure ME can continue delivering the discoveries and talent Washington needs.

At the same time, ME continues to raise the bar. Enrollment keeps rising, and for the first time, we held two separate graduations this spring. We're committed to meeting local industry needs and to the state's mandate to educate more Washington-grown engineers ready for high-tech jobs.



A rendering of MEB II from a feasibility study. Credit: Mahlum Architects, Inc.

To provide the education and research spaces needed to sustain this growth, pre-design for a new Mechanical Engineering Building (MEB II) is underway. We continue to work with the UW's Capital Planning Advisory Team to chart the course for approval next year. We count on your support, let us hear from you!

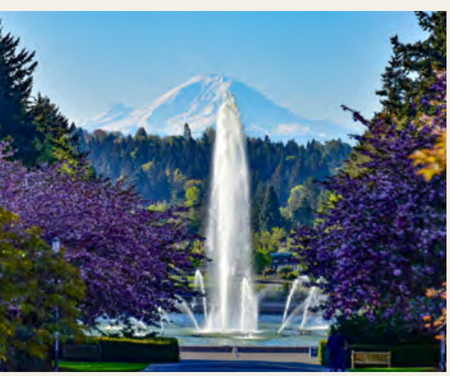
Alberto Aliseda
Mechanical Engineering Chair
PACCAR Endowed Professor

Alumni impact

A scholarship's ripple effect

As a ME undergraduate, Jeff Siegmeth (BSME '03), who was drawn to hands-on learning and inspired by mentors like Professor Per Reinhall, received the Paul Tsai Endowed Scholarship. The support, he says, gave him the freedom to follow his curiosity about innovation.

Jeff and his wife, Sydney Siegmeth, who received a communications degree in 2005, met while both students at UW and have been proud Huskies ever since.



The spirit of curiosity and possibility sparked at the UW guided their careers. Jeff began as a Boeing engineer, went on to law school, and returned to Boeing to work in the law department and on the 777X program. Sydney discovered her passion for storytelling at the UW and has built a career across public relations and global communications, now leading culture and communications at a Seattle startup.

The Siegmeths have pledged an endowed scholarship for ME students because they know how powerful a scholarship can be, especially one that connects one student to another. The scholarship Jeff held was created in memory of Paul T.C. Tsai, a ME student and passionate engineer who died in 1998. Paul's family and colleagues established it to support students who shared his love of engineering and design.

Meeting Paul's brother Pedro recently underscored why giving matters to the Siegmeths.

"The ripple effect of Paul's life, including his passion, brilliance and the way he inspired people around him, is still being felt," Jeff says.

"We hope our scholarship does for someone else what Paul's did for Jeff, and that the ripple keeps going," Sydney adds.

Interested in learning how your giving can strengthen ME?
Contact Associate Director of Advancement
Caitlin Christian, caitlk2@uw.edu

An engineer on skis

ME alum and world-class Para Nordic skier Nicole Zaino competed in the Paralympics.

By Chelsea Lin

In 2019, while she was a graduate student in ME, Nicole Zaino (Ph.D. '23) got involved in Seattle Sled Hockey. It was just the respite she needed from the rigors of her biomechanics Ph.D. research.

Seven years later, she's maintained that healthy balance as a part-time research scientist working for LUCI Mobility, which adds smart technology to power wheelchairs, and as a full-time athlete. Now living in Montana, Zaino trains six days a week, 11 months a year. She competed in her first World Cup in 2024 and first World Championship in 2025. In March, Zaino competed in Para Nordic skiing, including cross-country skiing and biathlon, at the 2026 Winter Paralympics in Italy.

Zaino had a stroke at age 8 that resulted in paralysis on her left side. She stayed active, but she says adaptive sports — where athletes use mobility aids to level the playing field — weren't nearly as prevalent at that time.

The experience of being an athlete on the Seattle Sled Hockey team defined her future as much as her studies did. In 2022, she decided to try Nordic, or cross-country, skiing with a rented sit-ski and immediately fell in love.

"When I sit-ski, it feels so amazing and graceful and freeing," Zaino says. "Apparently, I love endurance sports! I love finding the 'pain cave' and pushing it. And my knowledge of biomechanics and physics has definitely helped me understand what the most efficient position for maneuvering is, for climbing hills with my disability."

Eventually, she had a custom sit-ski built for her specific needs, which gives her lower-body stability on the skis. As a graduate student, her fascination with mobility aids like this informed her research. Her dissertation, under advising from ME Professor Katherine Steele and Heather Feldner in UW Medicine's Department of Rehabilitation Medicine, examined how individuals use and are impacted by mobility aids.

"I've always been interested in adaptive equipment — that's what can really change somebody's life after acquiring or being born with a disability," Zaino says. "That's what gives you access and levels the playing field with freedom and independence, all of those important things."

Photo by Gaia Panozzo

Department highlights

Katherine Steele, Arvid & Marianne Peterson Professor in Mechanical Engineering, was named a 2026 Fellow of The American Society of Biomechanics.

The U.S. Food and Drug Administration cleared SonoMotion's Break Wave lithotripsy device, which uses ultrasound to non-invasively fragment kidney stones on fully awake patients, without anesthesia. The technology was developed by UW researchers, including ME Professor and UW Physics Laboratory senior principal engineer **Michael Bailey**.

Ph.D. candidate **Mia Hoffman** and undergraduates **Scott Lee** and **Martin Liu** were named in the Husky 100, which recognizes 100 students who are making the most of their time at the UW.

A move in the right direction

Undergraduate Thomas Brown hopes to use his engineering skills to improve mobility aids.

Story by Lyra Fontaine
Photos by University of Washington

Thomas Brown knows firsthand how medical technologies can change your life. After experiencing two amputations and learning to walk with prosthetic feet, the ME undergraduate hopes to get involved with research related to designing mobility aids such as prosthetic limbs that are more comfortable, affordable and accessible.

Brown is drawn to biomechanics — applying mechanics to the movement or structure of living organisms — to improve medical care and mobility for people with limb differences.

Changing course

In 2015, Brown had his left foot amputated due to medical complications, and had further work on his left leg one year later. He was struck by the care and expertise of the nurses who worked with him as he recovered from the surgeries.

"That looks like something I want to do," he remembers thinking. "I want to help people."

He became licensed as a certified nursing assistant and enrolled in nursing at Tacoma Community College. In 2020 while completing prerequisite classes, Brown learned that his right foot would also need to be amputated.

After exploring options, he decided microprocessor-controlled prosthetic feet — which constantly adapt to changes in terrain — were a good fit. The problem is, a pair can cost tens of thousands of dollars. In addition, he experiences pain from how the prosthetic feet connect to his limbs.

These experiences drove him to pursue engineering instead of nursing. He wondered how prosthetic limb designs could be more accessible and better connected to the body to reduce discomfort. The hands-on aspect of engineering also appealed to Brown, who created his own customized wheelchair to meet his needs.

Top: ME undergraduate Thomas Brown is drawn to biomechanics to improve medical care and mobility for people with limb differences. Brown transferred to the UW from Tacoma Community College in 2025.

Finding the perfect fit

Brown received associate's degrees in mechanical engineering and material science and engineering from Tacoma Community College, then transferred to the UW in 2025. He selected ME because of the department's biomechanics focus.

One course that's made an impact on Brown is Biological Frameworks for Engineers, taught by Professor Nate Sniadecki, which covers the fundamentals of biology, biotechnology and biomechanics. The course includes a lab in which students measure the forces they produce by walking or jumping. Brown was excited to participate, contribute a unique dataset and learn more about his movement.

Brown looks forward to exploring prosthetics development next year for a senior capstone project. He also hopes to take part in undergraduate research. The Sanders Lab in the Department of Bioengineering has piqued his interest for their work in developing an adjustable prosthetic socket. If such a design was created for people with a prosthetic foot with a vacuum suspension system, "an adjustable socket would be amazing," he says.

"My goal at the UW is to use engineering to develop a better system to connect prosthetics to the body," Brown says. ■

Thomas Brown crochets in the The D Center (Disability and D/deaf Cultural Center) at the UW.

Engineering education for student success

By Lyra Fontaine

Assistant Teaching Professor Renee Desing recently opened registration for a new class focused on course design and pedagogy for engineering students who are teaching assistants or interested in teaching someday. The class filled up in one day.

An engineering education researcher and instructor, Desing has seen growing interest in the topic from students and faculty over the past years.

“There’s a gap because the faculty who are training engineers are experts in their fields,” Desing says, “but they may not have time to dive deep into best practices in the classroom that help set students up for success.”

Desing and other ME faculty, as well as the UW College of Engineering Office of Inclusive Excellence (OIE), are working to close that gap to support students.

A group of students at the 2025 capstone expo. Capstone programs like ME’s may be studied as part of engineering education research. Photo by Matt Hagen.

Engineering education 101

Engineering education research, which incorporates social science and STEM education, has expanded in the past 20 years. The field is broad, with the most common study focusing on teaching and learning.

“This might involve trying out a new teaching technique in my classroom to increase engagement or hands-on learning, seeing the impact on students and publishing the results to share lessons learned,” Desing says.

Researchers in the field might explore what it means to be an engineer, such as the ability to solve problems and be creative, and how that translates into teaching and learning. Research might also focus on first-year engineering students, capstone programs, teaching beyond the classroom, student characteristics, and ways to create inclusion, belonging and motivation.

Undergraduates explore how to become leaders in their classrooms, student organizations and future workspaces. Photo by University of Washington.

Supporting student success

As the instructor of Leadership Development to Promote Equity in Engineering Relationships (PEERs), Desing guides undergraduates as they explore and practice inclusive leadership skills through the lens of their own experiences and perspectives. The class prepares students to become leaders in their classrooms, student organizations and future workplaces.

ME Assistant Teaching Professor Renee Desing

To support her fellow faculty, Desing runs the College’s yearlong Inclusive Excellence Faculty Fellowship Program. Faculty attend training sessions to learn ways to create an inclusive teaching environment and receive support as they update one of their courses to center student needs.

A paper about the program analyzing the first cohort’s growth in academic success, cultural competence and critical consciousness received an award at the 2025 American Society for Engineering Education conference.

“Our faculty are seeking tools to create an environment where all students can achieve academic success,” Desing says. “Understanding the best ways for students to learn and grow is important because they’re our next generation of engineers.” ■

ENGINEERING BETTER MEDICAL IMAGES

ME Assistant Professor Ashish Manohar

How can mechanical engineers help improve medical imaging for better health outcomes?

Assistant Professor Ashish Manohar studies medical imaging physics. Below, he shares how he is developing improved CT imaging methods — including time-resolved imaging — to support better diagnosis and management of cardiovascular disease.

Why is medical imaging important in research and care?

Medical imaging allows us to see inside the body non-invasively, providing critical information about anatomy, function and disease that would otherwise be impossible to obtain. With advancements in computational modeling, medical imaging goes beyond just diagnosis. Images are now used as the foundation for developing patient-specific models that can guide treatment decisions, predict patient outcomes and develop personalized therapies.

However, the accuracy of these models depends on image quality. If images are inadequate due to poor quality or errors, the robustness of our modeling is compromised. This is why medical imaging is both an exciting and essential research area, where advances in image quality directly translate to more accurate patient-specific models.

How do mechanical engineers contribute?

Mechanical engineers bring a powerful combination of physics and computational modeling skills to medical imaging. On the physics side, we understand the fundamental principles behind how imaging systems work, including signal processing, which helps us tackle challenges like improving image quality. On the modeling side, we know how to take those images and build computational models that can simulate what's happening in a patient's body, whether that's how blood flows through an artery or how the heart contracts during each beat.

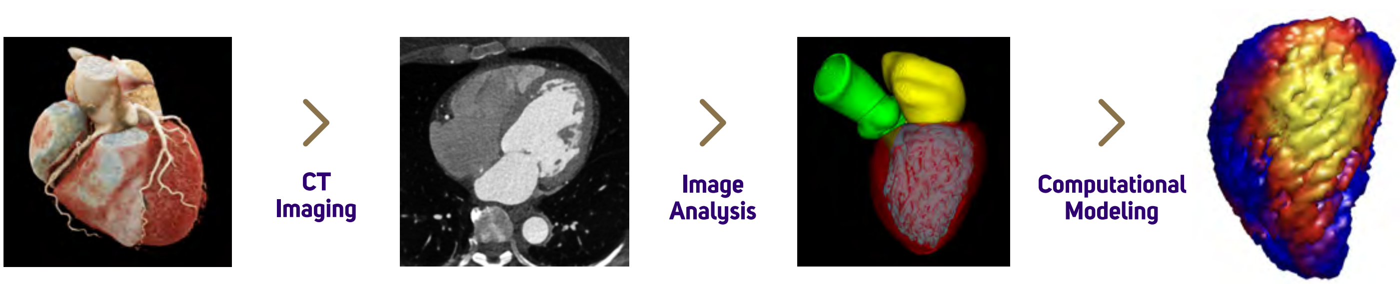
Mechanical engineers work on making better images and we figure out how to extract meaningful information from those images to help patients. UW ME is a prime example of this. Faculty like Juan Carlos del Álamo, Alberto Aliseda, Mehmet Kurt and Eric Seibel are pioneers in utilizing medical imaging to develop robust computational models for understanding human health and disease.

Tell us about your lab.

My lab's focus is in three main areas. First is imaging physics: understanding how CT images are formed and developing patient-specific approaches to optimize image quality while minimizing radiation dose to keep patients as safe as possible. Deep learning can identify complex noise patterns in CT images and remove them, allowing us to achieve high image quality at even lower radiation doses.

The second area is medical image analysis, where we develop imaging algorithms to automatically segment structures in the heart and extract quantitative measurements for clinicians. For example, we can use machine learning to identify and quantify heart tissue patterns that are associated with disease.

The third area is computational cardiac mechanics: taking those images and building patient-specific models to quantify how the heart moves and functions, which can serve as important biomarkers for conditions like heart failure.



Starting with high-resolution CT scans of the heart, a personalized computational modeling pipeline segments anatomical features and generates detailed 3D organ models that quantify structural and functional properties. Images provided by Ashish Manohar.

A new way to monitor the brain

By Lyra Fontaine

Brain pressure shifts throughout the day with activity and sleep. It can also change after an injury. Researchers in Professor Jae-Hyun Chung's lab developed a wearable device that measures brain pressure, which shows promise in helping to diagnose sleep issues or brain injury.

"Our device is innovative because it can continuously monitor brain pressure in multiple locations," says Chung.

The device is the first that can monitor brain pressure for 8 to 10 hours. While brain pressure is typically measured by surgically inserting a catheter or sensor, this device is non-invasive, low-cost and easy to use, which could make brain health monitoring more accessible.

In early tests, the researchers wore the device themselves and observed that brain pressure varies with sleep, body position and breathing. They developed a sensor-embedded cloth mask to monitor pressure and eye movement. Since brain pressure fluctuates with circadian rhythms, sleep stages and events like sleep apnea or rapid eye movement, it could be a way to assess sleep quality.

In a nap study with volunteers, the team compared device readings with participants' sleep-quality ratings and found links between certain pressure patterns and chronic sleep deficiency.

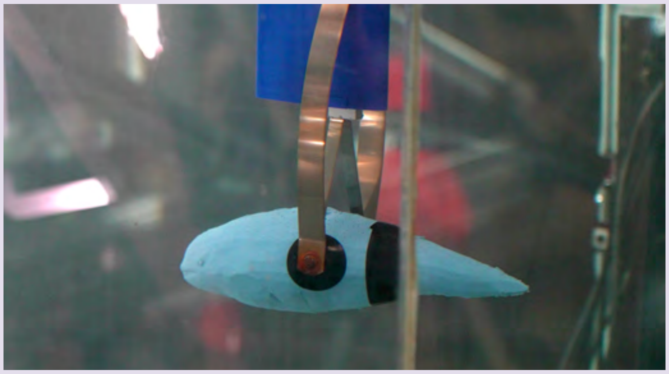
ME collaborated with UW Medicine and Dongguk University Ilsan Korean Medicine Hospital. In a separate study, they found that the device could also help assess traumatic brain injury.

Above: Researchers developed a sensor-embedded cloth mask to monitor brain pressure, which could be a way to assess sleep quality. Photo provided by Changwoo Lee.

Testing marine energy tech

By William Poor

At the UW Harris Hydraulics Lab, UW and Pacific Northwest National Laboratory researchers pass a small rubber model of a marine animal through a large tank filled with flowing water and fitted with a spinning turbine. On some runs, the model bonks against the turbine blades; on others, it receives a glancing blow or sails past undisturbed. When bonks or knicks occur, a small collision sensor on one of the turbine's blades detects the impacts and plots the interactions in a computer program.



The researchers are repeatedly simulating something that they hope will rarely happen in the wild: a collision between marine wildlife like a seabird, seal, fish or whale — or submerged debris — and an underwater turbine.

Marine energy — power harvested from tides, waves and currents — has enormous potential as a clean, renewable resource. But more information is needed about how large, commercial installations of underwater turbines or power-generating buoys could affect marine wildlife. Impact sensors, like the ones at Harris Hydraulics, could help.

"We want to make sure we're minimizing the chances of a collision in the first place," says Aidan Hunt, senior research engineer in ME. "But if a collision were to occur, we want to be able to detect it, and potentially avoid it, in real time. The available evidence suggests that collisions are rare, but we're taking a 'trust-but-verify' approach."

A rubber model is used to assess potential impacts of marine energy tech on wildlife. Photo provided by William Poor.

BUILDING BATTERIES BETTER

Looking beyond incremental innovations in energy storage technology, Jie Xiao wants to catalyze a robust domestic battery industry — from mining to manufacturing.

Story by Ed Kromer | Photos by University of Washington

Jie Xiao, a widely respected energy storage researcher, is working to catalyze a viable battery manufacturing industry in the U.S.

Most battery innovations begin in academic environments that are designed for discovery rather than the cost, time and scale pressures of industry.

Bridging this gap is the mission that animates Jie Xiao, the Boeing Martin Professor in Mechanical Engineering, who joined the UW in 2024. Xiao is one of the nation's most respected — and connected — battery innovators. She's becoming a fulcrum of coordinated activities around campus and beyond to translate academic innovations into a viable domestic industry.

"Traditional battery R&D — including my own — operates on an atomic level of understanding. And we have developed tremendous knowledge," says Xiao. "But we need to turn this knowledge into resilient manufacturing science and engineering, which is a very different prospect."

A query that launched a career

Xiao's career in electrochemical energy storage began almost by accident. As an undergraduate studying physical chemistry two decades ago, she stumbled upon a paper on hydrothermal synthesis of battery materials by M. Stanley Whittingham, who would win the 2019 Nobel Prize in Chemistry for his role in developing the lithium-ion battery.

Intrigued, Xiao emailed Whittingham a list of questions. To her surprise, he replied the next day. The conversation continued, and Xiao soon joined Whittingham's research group at Binghamton University.

After earning her Ph.D., she worked at the Pacific Northwest National Laboratory (PNNL), where she helped launch efforts to develop more efficient energy storage materials and technologies. As the Battelle Fellow, she worked across scales — from batteries as small as a grain of rice and as thin as a strand of hair to systems supporting grid energy storage.

From mining to manufacturing

The natural resources company Albemarle recently collaborated with Xiao to develop high-energy battery materials using advanced lithium salts. The research, supported by the U.S. Department of Energy (DOE), discovered a unique sublimating property of lithium oxide that dramatically reduced the time and energy required for conventional battery manufacturing.

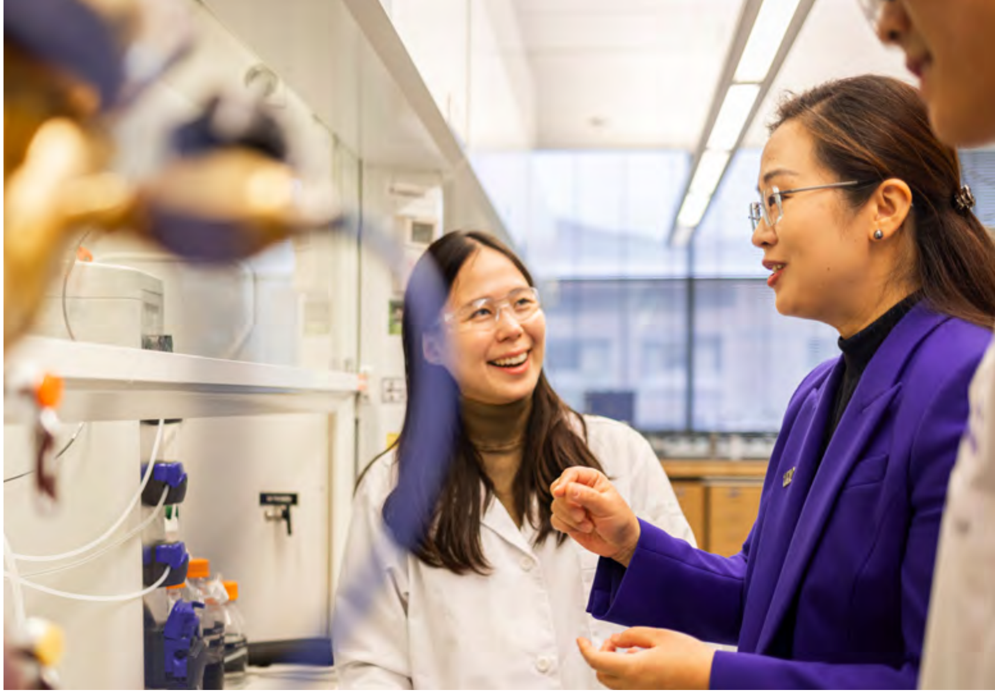
"Not only did the research turn out to be very successful, it also completely changed my mindset on fundamental research," Xiao says.

She began pursuing "cost-focused" fundamental science, which considers the real-world issues of industrial production. She uses a baking metaphor to explain this approach: If you wanted to use a recipe for 60 cookies to bake 60,000 cookies, you'd need to make significant adjustments in the ingredients and methodology to minimize cost and time while producing quality treats with consistent look, texture and taste.

Xiao's lab is using AI to accelerate the processing and scale-up of energy-bearing raw materials, such as malachite, shown here.

It's the same with batteries. Within their common anatomy of anodes, cathodes and electrolytes that capture and convey energy, there can be infinite combinations of component materials, processes and reactions. These are well understood in laboratory conditions, but manufacturing batteries at industrial scale introduces a different set of constraints. Accounting for them is essential to closing the gap between lab and industry.

"It's a golden opportunity for researchers," Xiao says. "We have the tools. We have the knowledge. But we can no longer do research without considering the application."



Xiao is intentional about mentoring students, who explore many facets of battery design and production.

Getting in the battery race

Demand is exploding for batteries to power everything from cell phones to drones, heat pumps to power tools, EVs to AI data centers. Most of this demand is currently being met by China, which has an enormous lead in manufacturing energy storage.

In response, Xiao is catalyzing construction of a robust supply chain and industry in the U.S.

A recent paper, co-authored by Whittingham, engaged industry leaders to outline the scientific challenges for mining and manufacturing, with the intent of fostering research that directly supports industry. She just launched a new DOE-sponsored journal dedicated to furthering energy storage manufacturing science.

Through her joint appointment with PNNL, Xiao continues leadership roles in two DOE-supported consortia dedicated to increasing battery capacity and hosts industry workshops to understand challenges and opportunities in battery manufacturing.

At the UW, she has joined a cohort of energy storage researchers that includes ME faculty Corie L. Cobb, John Kramlich and Aniruddh Vashisth.

And Xiao is leading the UW's Intelligent Battery Engineering and Automated Manufacturing certificate program, starting in fall 2026 with support from the DOE's Advanced Materials and Manufacturing Technologies Office.

"We need to unite and develop a core strength to become a national leader in energy storage manufacturing," Xiao says. "I think this is a great opportunity for the UW."

It's also a great opportunity for Washington state, which is rich in natural resources, biomass and brain power. With companies establishing a foothold in advanced battery materials and plenty of local tech industry demand for energy resilience, why not headquarter a national industry right here?

Xiao hopes these activities will encourage local startups and attract established companies to the state.

Paying it forward

Xiao's lab is a microcosm of her larger dream. Inside this bustling hive, students lean over electroplating machines and laser microscopes and an air-fryer-sized furnace that can reach 1200 degrees centigrade in minutes to experiment with various critical minerals and materials. They have come here to pursue their own curiosity and career goals in a community of inquiry. And Xiao ensures they get the kind of welcome she once received from a future Nobel laureate when she was just finding her way.

"I want to inspire more people to study in our field," Xiao says. "It's going to take a lot of talented people from different backgrounds working together to realize a thriving domestic energy storage manufacturing industry and supply chain." ■

On the cover: A researcher holds a "smart window," which is used to improve energy efficiency (top); Jie Xiao speaks to students in her lab (bottom).

3D vision for surgical precision

A UW team is creating real-time 3D models to help guide surgeon's hands during endoscopic procedures.

By Lyra Fontaine | Photos courtesy of Nicole Gunderson

ME and UW Medicine researchers have developed a solution to help surgeons perform safer, more complete and more precise endoscopic procedures in the sinus and skull.

This could serve the one in eight adults who suffer from chronic rhinosinusitis, a disease of the areas within a bone between the eyes and behind the nose bridge. These cavities are made up of honeycomb-like structures that can become inflamed or contain diseases that surgeons can remove. To avoid hitting critical structures near the cavities, surgeons often leave behind tissue, and 30% of the surgeries need to be repeated.

To reduce the rate of repeat procedures, surgeons need an accurate guide.

The UW-developed VISTA (vision-integrated surgical tracking assistance) system can provide much-needed guidance by creating 3D models of the surgical field as tissue is being taken out. The models are then used to update medical imaging taken before surgeries to show surgeons how much tissue has been removed and to quantify how close their medical tools are to critical structures such as the eye and brain.

Nicole Gunderson and Dr. Waleed Abuzeid, UW Medical Center rhinologist and otolaryngologist, conducted an endoscopic survey of a 3D-printed sinus model to check the surgical completeness.

"VISTA could create a huge impact for patients and the people paying for image-guided surgery, including sinus and skull-based procedures," says ME Ph.D. student Nicole Gunderson, who leads engineering development for the project. "I'm proud to be one of the people working on it."

After senior faculty donated their time and money in the project's early stages, the student team secured funding for ongoing research. They won second place in the 2025 Holloman Health Innovation Challenge and received technology commercialization funding from the Washington Research Foundation.

Gunderson works on the project with UW Otolaryngology-Head and Neck Surgery residents Jeremy Ruthberg, MD, and Graham Harris; ME Ph.D. student Pengcheng (Pearson) Chen; and UW research assistant Di Mao.

Advisors and lead researchers include ME Research Professor Eric Seibel; Randall Bly, MD, an associate professor of otolaryngology at the UW and a pediatric otolaryngologist at Seattle Children's; and Waleed Abuzeid, an associate professor of otolaryngology at the UW.

"The students have shown exceptional skills in advancing the state-of-the-art in 3D endoscopic video reconstruction while playing key roles in driving this multidisciplinary project forward, working hand-in-hand with surgeons," says Seibel.

An accessible solution

Surgeons use an endoscope — a device with a light, small camera at the end of a long, flexible tube — in some minimally invasive surgeries to inspect the inside of the body. It can be challenging to completely remove all diseased tissues with endoscopic surgery because of limited camera views and the pre-surgery CT scan not representing the current surgical scene.

"I was shocked by the rates of inaccurate surgeries and revision surgeries that some patients undergo because of the inadequacy and the inaccessibility of currently used technologies," Gunderson says. "A second procedure is a big deal for kids undergoing pediatric surgery and for the people paying for it."

Pairing a standard endoscope with VISTA could provide safer, more accurate and more accessible tracking.

Gunderson and Chen developed the methods behind creating the 3D models, reaching a breakthrough when they found a way to model depth with a standard, one-camera endoscope. They simulated how humans determine the depth from our eyes to different objects in our environment by calculating the distance between our two pupils and the focal length of our eyes, comparing the slightly offset images from each eye.

Eric Seibel, Nicole Gunderson, Jeremy Ruthberg and Pengcheng (Pearson) Chen after accepting their Holloman Health Innovation Challenge award. Photo by Buerk Center.

First, a computational process reconstructs a 3D scene from a series of video frames, generating optimized views of the image. An algorithm built by the researchers then generates 3D depth by synthesizing two camera viewpoints from different angles.

Using the synthesized viewpoints, the algorithm can generate 3D reconstructions of the live surgical scene, displaying updated models as surgery progresses. These models allow surgeons to accurately measure the completeness of the procedure and their live distance to various anatomical structures.

Existing electromagnetic systems can track endoscopes during surgery, but have a 2 mm margin of error, are only accessible in certain hospitals and add an additional cost.

Graham Harris, a UW medical student assisting with the project, captured an endoscopic video of the model the team will use to create 3D reconstructions of the scene.

In contrast, VISTA has demonstrated a 0.3 mm margin of error in 3D reconstruction accuracy and uses tools already widely available in surgical rooms, requiring less training.

Collaborating with clinicians

While Gunderson studies how to update the CT scans with 3D models, UW Medicine collaborators use clinical data to validate the models' accuracy. The team also studied cadavers to prove that the technology is effective in clinical models. The researchers are now validating their work in Seattle Children's operating rooms, where they are comparing sinus surgery videos with the VISTA 3D models.

Working with clinicians enabled the engineering team to find an ideal application for their technology.

"The collaboration with UW Medicine has been fantastic," Gunderson says. "Once we talked to clinicians about the gap in image-guided surgery, they gave us such a clear need related to what we were doing already. Putting the clinical need first helped us advance the technology and drive commercialization."

The researchers hold multiple patents for VISTA and related technology, underwent the UW Regional National Science Foundation Innovation Corps and have started filing for U.S. Food and Drug Administration approval.

Now they're exploring how VISTA's 3D modeling could be used for a wider variety of image-guided surgeries, including neurosurgery.

"We are looking forward to applying our technology to look at brain tissues that move as tumors are removed," Gunderson says. "The focus of our upcoming research is to model these deformable, dynamic structures." ■

MECHANICAL ENGINEERING
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2026 graduation

This year, ME awarded 233 bachelor's, 124 master's and 37 doctoral degrees to the class of 2026. The department appreciates the friends and family who came together to celebrate their achievement.

A special thank you to this year's graduation speaker, Greg Hyslop, a respected aerospace industry leader who retired in 2023 after a 41-year career at Boeing. Starting as a guidance and control engineer, Hyslop progressed through various technical leadership and program management positions before completing his career as chief engineer, leading the 50,000+ member engineering team at Boeing.

Hyslop is an affiliate ME professor at the UW, a Fellow of the American Institute of Aeronautics and Astronautics and an active board member for multiple academic and industry groups, including the Dean's Advisory Board for the University of Nebraska College of Engineering and the National Council for the McKelvey School of Engineering at Washington University in St. Louis.

He earned his bachelor's degree in electrical engineering and master's degree in mathematics from the University of Nebraska, and he earned his doctor of science in systems science and mathematics from Washington University in St. Louis.

Thank you, speakers

Chair's Distinguished Industry Lecture Series:

Carl Hergart, PACCAR; Aaron Parness, Amazon; Jake Smith, Microsoft

Boeing Advanced Research Center Seminar:

Dr. Agnes Blom-Schieber, Boeing

Leadership Seminar Series:

Brian Allen, ATS (BSME '78); Michelle Carey, Boeing (BSME '01); Stefania Fresca, UW Mechanical Engineering; Jeff Hawkey, Toray Composites America (BSME '01, MBA '16); Allison Headlee, LMI Aerospace (BSME '04, MSME '09, MBA '23); Stephen Jones, DNV Energy USA; Wade Marquette, Amazon (BSME '19, MSME '21, Ph.D. ME '25); Robyn McLaughlin, Microsoft; Billy Price, BILLY Footwear (BSME '02)

Department Seminar Series:

Tom Matula, UW Applied Physics Laboratory; Michael Dickey, NC State University; Ramulu Mamidala, UW Mechanical Engineering; Johannes Fröch, UW Electrical & Computer Engineering; Mohammad Malakooti, UW Mechanical Engineering; Dayong Gao, UW Mechanical Engineering; Quansan Yang, UW Materials Science & Engineering; Bill Kuykendall, UW Mechanical Engineering (Advanced Composites Center seminar); Nicholas Colonnese, Meta; Krithika Manohar, UW Mechanical Engineering; John Palmore Jr., UW Mechanical Engineering; Lin Han, Drexel University; Paul Fasolo, SonoMotion