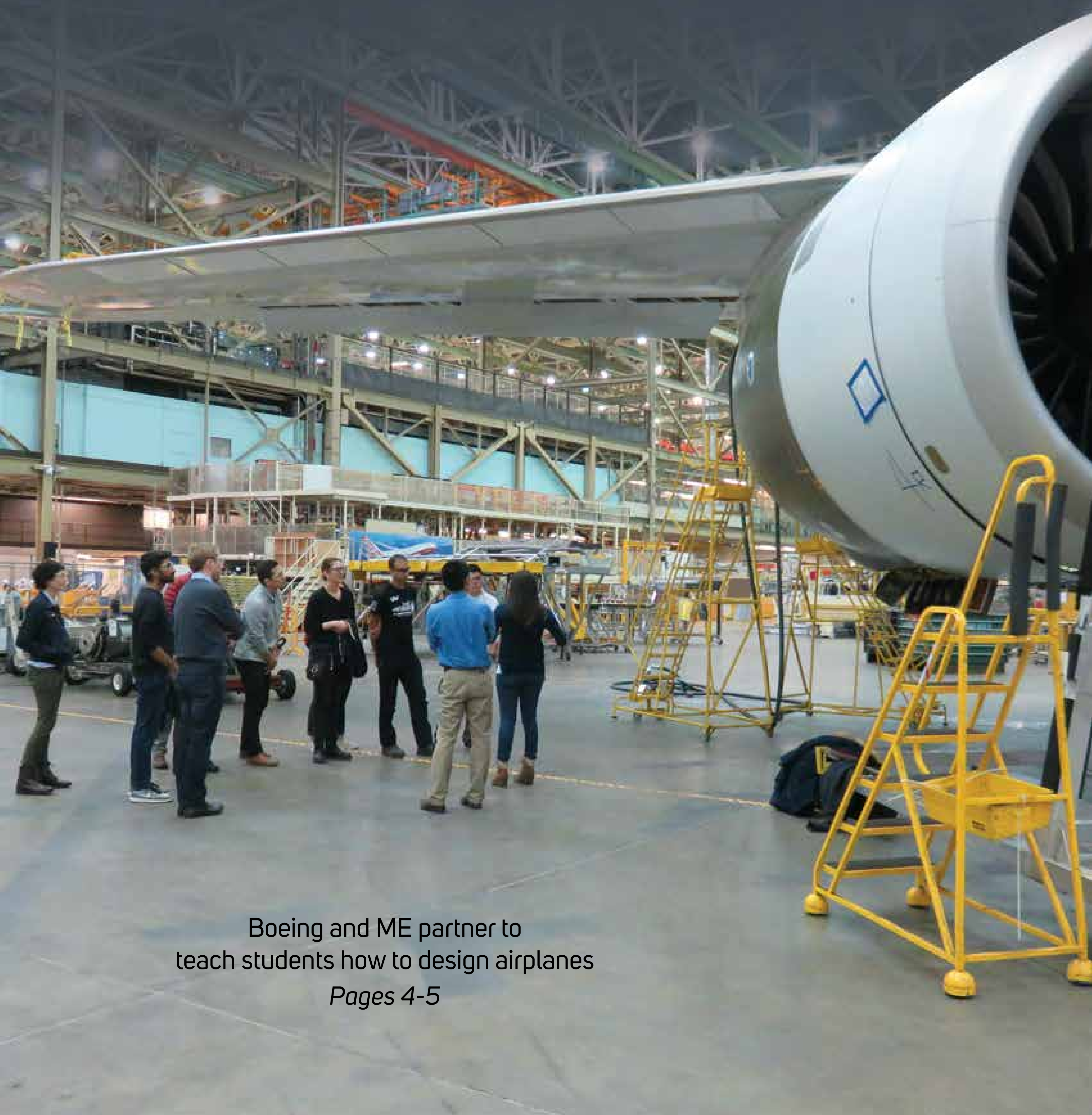
MECHANICAL ENGINEERING | UNIVERSITY *of* WASHINGTON

SPRING 2018

The MEssenger

NEWSLETTER



Boeing and ME partner to
teach students how to design airplanes

Pages 4-5

Purposeful partnerships

Thanks to meaningful collaboration with our alumni and industry partners, UW Mechanical Engineering (ME) is developing a new generation of engineering leaders and innovators.

Nowhere is this more evident than in our longstanding partnership with The Boeing Company. Over the years, Boeing has supported ME students through scholarships and internships and has provided our faculty with critical support to seed exciting new projects.

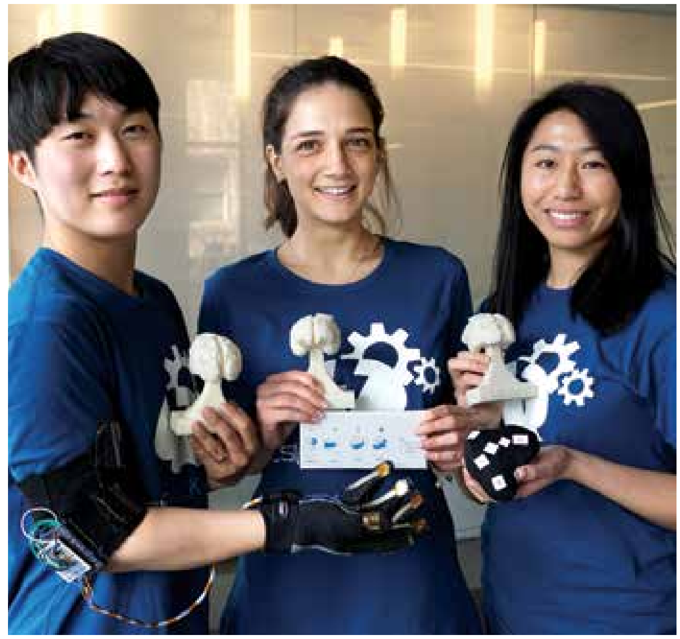
Our collaborative work has opened doors to innovative laboratories and learning opportunities. The Boeing Advanced Research Center (BARC), a research lab housed in ME, represents a new paradigm in the execution of industrial research at the UW. Through BARC, Boeing-employed affiliate instructors work in the lab on a full-time basis, alongside our faculty and students. Together they pursue translational research to be used in aircraft and spacecraft assembly and manufacturing.

The ME course "Structural Engineering in Commercial Aircraft" is another unique collaboration that Boeing has developed with us. Stemming from BARC and jointly taught by Boeing engineers and ME faculty, this class provides students with an overview of the structural subsections of a commercial airplane. Each session is taught by a different team of Boeing engineers, many of whom are ME alumni with decades of practical application knowledge honed on the job.

A top employer of ME graduates, Boeing has provided employees with a meaningful way to give back through this class. Only three years old, it has already proven to be a rewarding experience for everyone involved — students, faculty and alumni. I'm excited for you to learn more about it in this issue.

Partnerships between industry and ME are beneficial for students, faculty and businesses alike. We're thrilled to engage engineering minds, expand the future of mechanical engineering and help Washington state industry thrive.

Per Reinhall
Mechanical Engineering Chair



Student news

Master's student **Chung Hoon Choi** and teammates won the 2018 Center for Sensorimotor Neural Engineering Hackathon. Their winning project provided grasp-training and physical therapy feedback for those impacted by stroke or other sensorimotor disorders.

Doctoral student **Lindsey Barner** received a National Science Foundation graduate fellowship.

Seniors **Karley Benoff** and **Casi Goodman** were named to the 2018 Husky 100 cohort. The Husky 100 recognizes students who are making the most of their Husky experience.

ACBI, an Engineering Innovation in Health team, won third place prize in the Buerk Center for Entrepreneurship's Hollomon Health Innovation Challenge. The team of ME and electrical engineering students created a device that makes continuous bladder irrigation treatment less time intensive and expensive, while reducing the risk of complications for patients.

Doctoral student **Soyoung Kim** received the UW College of Engineering Student Teaching Award.

Master's student **Jan Wittenbecher** received the UW Graduate School's Distinguished Thesis Award. Wittenbecher used his involvement in EcoCAR to investigate the feasibility of a hybrid muscle car for his thesis.

Amplifying movement and performance

The AMP Lab analyzes motion and performance in humans and machines.

This winter we welcomed the AMP (Amplifying Movement and Performance) Lab to the growing list of ME research facilities. Directed by ME assistant professor Kat Steele, electrical engineering assistant professor Sam Burden and rehabilitation medicine associate professor Val Kelly, this state-of-the-art co-laboratory enables experiments with clinical and research populations interacting with autonomous and semi-autonomous machines.

Using a rich sensor suite — including high-speed motion capture, instrumented treadmills, force plates and wearable devices — and mechanical infrastructure, such as a bodyweight support system and heterogeneous terrain, the lab allows researchers to conduct studies that advance understanding of human and robot movement in health and disease.

“We envision a future where neurophysiological trauma and disease are diagnosed automatically, where monitoring and intervention can be conducted continuously within and outside the clinic, and — when needed — personalized assistive devices enhance ability of all individuals,” Steele said. “The AMP Lab will allow us to work toward these goals, and more.”

Learn more at depts.washington.edu/amplify

ME External Advisory Board

Thanks to the following alumni and friends for participating on this year’s advisory board:

David Barr, Director, Boeing Programs, Hexcel
Rebekah Bastian, ’02 BS, VP of Community and Culture, Zillow Group
Anders Brown, ’92 BS, ’94 MS, President, Valence Group Inc., External Advisory Board Chair
Justin Brynestad, ’03 BS, Managing Structural Engineer, Blue Origin
Steve Chisholm, ’86 BS, Director of Structures Engineering, The Boeing Company
Bijan Dorri, ’82 PhD, Singapore / Advisor, Medical Technologies, A*STAR
Dan Ervin, ’80 BS, Executive VP, Varius Inc.
Carl Hergart, Director, Advanced Technology, PACCAR Technical Center
Brian Horman, ’77 BS, VP Facilities & Engineering, Just Biotherapeutics
Peter W. Janicki, ’89 MS, President and CEO, Janicki Industries, Inc.
Michael C. Kintner-Meyer, ’94 PhD, Energy-Environment Directorate, Pacific Northwest National Laboratory
Paul Leonard, Principal, Leonard Consulting, LLC
Tom Loutzenheiser, ’83 BS, Executive Vice President of Business Development, PRECO Electronics
Jill McCallum, President, Pacific Rim Aerospace Corporation
Colleen McClure, ’86 BS, ’05 MBA, Enterprise EHS Engineering Integration Senior Manager, The Boeing Company
Hamid Mortazavi, ’82 MS, ’89 PhD, Research Specialist, 3M Corporate Research Lab
Ron Prosser, ’70 BS, CEO, The Prosser Group
Michael K. Sekins, ’81 PhD, Medical Technology Consultant
Fred Silverstein, ’72 MD, UW Clinical Professor of Medicine, Gastroenterology, and General Partner, Frazier & Co. (retired)
John T. Slattery, Vice Dean for Research & Graduate Education, UW School of Medicine
Tim Stearns, ’90 BA, Catalyst Solutions
Tina Toburen, ’92 BS, ’94 MS, President, T2E3 – Energy Efficiency Enterprises
Gil Wootton, ’89 BS, Managing Director, Accenture

SECRETS OF THE SKY

In this novel course, Boeing engineers and ME faculty partner to teach students how to design commercial airplanes.

By Chelsea Yates

Siqi Chen has never won the lottery, but she imagines it would feel similar to finding out about ME 498/599, Mechanical Engineering (ME)'s "Structural Engineering in Commercial Aircraft" class.

"In addition to focusing on airplane design structures — my favorite subject — the class is taught by engineers from The Boeing Company, who are actively doing the work we discuss in class," the aeronautics and astronautics (AA) senior says. "How often do you get that kind of opportunity?"

Very rarely, if ever, according to ME associate professor Nathan Sniadecki. Since 2015, he and ME doctoral student Rishi Pahuja have worked with Boeing engineers to develop the course, which gives students an overview of the different structural subsections of a commercial airplane.

"From the nose to the tail, we rip the skin off of an airplane to show students what's inside," he says.

But understanding the engineering that goes into designing airplanes is just part of the class.

"In aircraft design, professional engineers have to consider factors that don't arise in academic engineering classes: costs, customer satisfaction, airplane wear and tear, FAA regulations and safety concerns," Sniadecki explains. "We want students to realize that engineering is not just numbers and calculations — something might look good on paper but, in the real world, that's not enough."

The class is built around industry insight — exposing students to what goes on in the workforce, what engineering concepts Boeing teams use and apply in their daily activities, how they navigate industry policies and procedures — to help students better understand the multi-layered nature of engineering.

Preparing for take-off

"After joining ME's external advisory board in 2013, I talked with ME Chair Per Reinhall about ways we could deepen Boeing's relationship with the department," says Boeing Structures Engineering Director Steve Chisholm, '86 BSME. "Many of our engineers are ME graduates, and it seemed like there was more we could do to invest in our ties to the department."

Initially ME and Boeing partnered on a lecture series, in which Boeing engineers gave talks on campus. That worked well, Chisholm says, but it still didn't seem like enough.

With the help of Sniadecki and Boeing engineering manager Michelle Carey, '01 BSME, they evolved the lecture series into a quarter-long course, ME 498/599. First offered in 2016, it has met every academic year since then.

The course consists of about 30 upper-level undergraduate and graduate students; two-thirds are ME students and a third are AA to replicate the composition of a typical Boeing structural engineering team. Each class meeting is led by a different Boeing engineering teaching team with expertise in one of the many structural subsections of a plane: propulsion, wing box, fuselage, empennage, doors and landing gear, to name a few.

"About 70% of the instructors bleed Husky purple, and they jump at the chance to share their knowledge, reconnect with their alma mater, and answer students' questions about what engineering is like after graduation," says Carey.

While ME faculty help plan the course and prepare the Boeing engineers for the front of the classroom, the engineers develop all of the curriculum and homework assignments. "It's a lot of material, and it's all been created from scratch," Chisholm explains. "When printed, it's thicker than any textbook I ever bought in school."

In addition to instructor-led classroom lectures, demos and projects, students visit Boeing facilities, including the factory floor in Everett and the Thompson site, where they tour the hull of a retired 737.

Engaging engineering minds, expanding the future of aerospace

New to the teaching team this year, ME assistant professor Sawyer Fuller hopes students expand their appreciation of the industry.

"To think about how far airplane technology has come in 120 years is impressive," he says. "Boeing engineers are passing down 100+ years of aerospace expertise to our students. That's so special."

The course has also presented valuable mentorship opportunities among Boeing employees, as senior experts are paired with early career employees to form teaching teams.

Kenny Huynh, '17 BSME, can attest to this. A first-year Boeing mechanical design engineer, he works on Boeing's 787 door design team. As a ME student he participated in the first class cohort and also held a Boeing internship. This year he served as one of the course instructors.

"I was thrilled when Wayne Peterson, '85 BSME, one of my Boeing mentors, invited me to join the doors and fuselage teaching team," he says. "Boeing's senior engineers are a wealth of expert knowledge, and as a young professional I appreciate any opportunity to learn from them. To now be a part of that knowledge flow to students — some who may be future Boeing engineers — is really neat."

While a student in the class, Huynh says that the tours were impressive, but what he remembers most were the lecture slides prepared by the instructors.

"I really enjoyed going through those slides on my bus ride home after class," he says. "I couldn't believe that, as a student, I had access to such rich knowledge!"

Now that he's an instructor, he wants to pass on this excitement to others.

"I hope students see me as an example," he says. "This class helped me prepare to work at Boeing; it can for them, too.

"Boeing engineers are passing down 100+ years of aerospace expertise to our students. That's so special."

– ME assistant professor Sawyer Fuller

Making play possible

Driven by students, HuskyADAPT is teaching the UW community how to modify toys for kids with disabilities.

By Chelsea Yates

When Molly Mollica relocated to Seattle in 2016 for graduate school, she was surprised that there wasn't a single registered toy library in Washington state. In Ohio — where she'd moved from — there were more than 70.

"Toy libraries provide play experiences for children and families, especially for kids with disabilities," the bioengineering PhD student explains. "Not all toys are accessible to all kids, depending on their abilities."

In fact, many children with disabilities often cannot access toys as they were originally designed. This inability to interact with a toy means that the child cannot gain the developmental benefits of play, such as learning cause and effect, developing motor skills and increasing independence.

Some manufacturers offer modified versions of toys; however, they can cost much more than original models. As an undergraduate at The Ohio State University, Mollica learned that she could apply basic engineering and circuitry skills to adapt toys for local libraries at a fraction of the cost.

Mechanical engineering (ME) master's student Brianna Goodwin had a similar experience. While an undergraduate at Oregon State University, she got involved with Go Baby Go, a program that modifies battery-operated ride-on cars for young children to meet their unique mobility needs.

"Go Baby Go didn't have a presence on the UW campus when I arrived, and I wanted to change that," she says.

Soon after starting their graduate programs, Goodwin and Mollica met each other. They also connected with ME assistant professor Kat Steele, whose research is situated at the intersections of universal design, accessibility and inclusive community building.

"With assistive technology and accessible design, there's a lot of room for fresh ideas and innovation, so it's a great space for student energy," Steele says.

Steele, Goodwin and Mollica contacted other researchers, educators and clinicians, including human centered design and engineering professor Dianne Hendricks; Anat Caspi, who directs the Taskar Center for Accessible Technology in the Paul G. Allen School of Computer Science & Engineering; Heather Feldner, a pediatric physical therapist and disability researcher in Steele's lab; and Shawn Israel, a pediatric physical therapist and staff member in UW Rehabilitation Medicine. Feldner and Israel were starting a local Go Baby Go chapter, so the timing was ideal. The faculty knew other students interested in accessible design, and soon a campus network began to form around accessible play technology.

Adapting toys and building community

"With a few simple instructions, modifying an electronic toy is surprisingly simple process with a lot of positive impact and educational benefits," Mollica explains. "To adapt a toy, you open it and assess its circuitry, then you solder a headphone jack in parallel with the original activation switch, which allows you to activate the toy by pushing a large button or whatever sort of activation option works for the child using it."

Mollica began working with Caspi to organize regularly occuring toy adaptation workshops on campus. Interest in them grew quickly, so to cover the costs, she and the team applied for and received Husky Seed Fund and AccessEngineering grants.

Goodwin worked with Steele and other faculty to outline a plan to develop a student organization, which they named HuskyADAPT (short for Accessible Design & Play Technology). They focused the new club's efforts into three project areas: toy adaptations; Go Baby Go modified cars; and individualized design projects, some of which integrated with a VIP course that Steele leads.

"Professor Steele's lab has become a hub for individuals in Puget Sound who want or need assisted living devices and innovations," says Goodwin. "She compiles project ideas and transforms them into student-led research and design projects. The club then gives students a structure and supportive community through which to pursue them."

Advancing accessible design

In its first year, HuskyADAPT has trained more than 300 students and community members in toy adaptation. Students from across campus regularly participate in the club's events and meetings.

"The interdisciplinarity of HuskyADAPT is exciting," says Goodwin. "I can't think of many project-based student organizations that bring together engineering students with future physical and occupational therapists and educators."

The club has also been collaborating with students from Inglemoor High School in Kenmore, Washington, to adapt ride-on cars for local preschoolers with disabilities. Club members worked with Inglemoor's engineering and design technology instructor Michael Wierusz, '99 BSME, to create a Go Baby Go design project for one of his senior classes. Club members visited Inglemoor twice a week to teach accessible design and mentor students.

> "With assistive technology and accessible design, there's a lot of room for fresh ideas and innovation, so it's a great space for student energy."
>
> – ME assistant professor Kat Steele

"At the end of the project, the high schoolers visited a local preschool to see first-hand how the cars helped children be more independent and have an increased ability to explore," Goodwin says.

Looking ahead, club members hope to expand their connections with community partners.

"By equipping others with the accessible design knowledge and the skills to adapt and adjust toys, HuskyADAPT is making it possible for more kids and families in the Seattle area to access toys that best fit their needs," says Mollica.

But it doesn't stop there.

"The club also provides students with valuable skills they will take into their careers," adds Steele. "If we can train engineering students in accessible and inclusive design today, we can help create a more diverse and prepared engineering workforce for tomorrow."

Keep up with HuskyADAPT at depts.washington.edu/adaptuw

INNOVATIONS FOR HEART HEALTH

We highlight six research projects led by ME faculty committed to advancing cardiovascular health and saving lives.

According to the Centers for Disease Control and Prevention (CDC), heart disease is the leading cause of death for adults in the U.S. The CDC also estimates that 735,000 Americans experience a heart attack each year, and nearly 30% of those are repeated occurrences.

UW mechanical engineers are enabling health care providers to better understand and treat cardiovascular disease, including heart attack, stroke, arrhythmia, congestive heart failure, angina and more. Some of their research projects include:

Clearing clogged arteries

By innovating endoscope technology, ME research professor Eric Seibel is working to create safer and more effective therapies that open blockages in the cardiovascular system. Endoscopes are generally used to look inside the body, but Seibel is exploring ways to enhance a UW-invented scanning fiber endoscope (SFE) so that it can deliver laser light, allowing it to image, diagnose and remove arterial fatty plaque and fibrous clots. Currently no other scope can look down these vessels in resolutions as high as the SFE. Because it's flexible and small (1-mm diameter), it's an excellent candidate to become the first high-resolution catheter scope, or "eye" at the tip of a guidewire used in the cardiovascular system.

Seibel has been working with UW Medicine's Center for Cardiovascular Innovation and the startup company VerAvanti to manufacture and make this device more widely available so that cardiologists, surgeons and other health care professionals can better diagnose and treat individuals at risk for stroke and/or heart attacks.

Designing better hearts for children

Children born with congenital heart defects often must undergo several surgeries to rebuild their hearts. Currently, surgeons build patches of graft tissue to reshape arteries and chambers as needed in the operating room. ME associate professor Alberto Aliseda is working with pediatric cardiologists and surgeons to develop tools and processes to create these patches before surgery, thereby minimizing the time that a young patient's heart is stopped during the operation.

Aliseda's team hopes to create physical models so surgeons can practice and achieve better results, and researchers can measure the flow velocity, pressure and energy more accurately to improve calculations and optimization.

Improving LVAD placement and management

Individuals with advanced heart failure whose hearts are no longer able to pump enough blood to meet their bodies' needs may be recommended for left ventricular assist device (LVAD) implant surgery. LVADs are devices that attach to the heart to help it pump more blood with less work.

ME associate professor Alberto Aliseda is working to improve the implantation process and management post-surgery by applying computational fluid dynamics, 3D printing and design optimization to the surgical procedures and the clinical decisions regarding patients' pumps. Identifying the best location to implant the LVAD and better managing its performance will help reduce stress levels on the blood and cardiac tissue, help doctors provide more individualized care to patients, and help researchers better understand complications surrounding advanced heart failure.

Unlocking the secrets of heartbeats

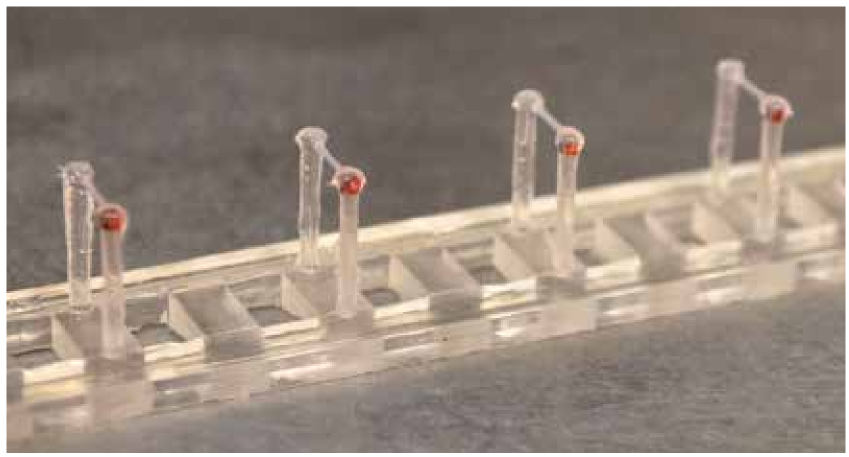
Implantable Cardioverter Defibrillators (ICDs) can prevent sudden death in patients with congestive heart failure. An ICD is a battery-powered device placed under the skin to monitor heart rate. It connects to the heart by thin wires; if ventricular fibrillation (VF) or a sudden death is detected, the device delivers a powerful electric shock to restore normal heartbeat.

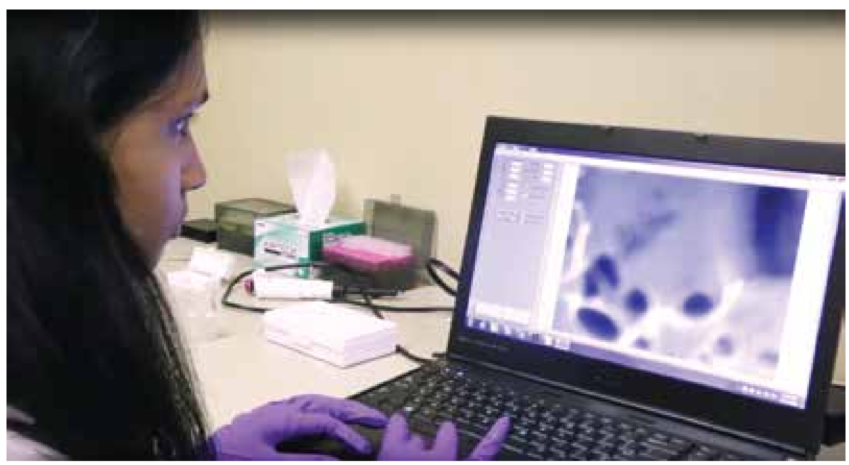
While this device can extend patients' lives, they aren't able to know when they might experience an abnormal heartbeat and thus receive a jolting shock. MEprofessors Per Reinhall and Steven Brunton and alumnus Wan-Tai Au-Yeung, '16PhD, are exploring how to use machine learning to detect signs of irregularitiesin the heart rate data of patients with ICDs before the onset of VF. By reviewing and assessing ECG data from 1,000 heart failure patients with ICDs, they hope to identify patterns that will predict when a shock might occur and provide patients with advanced warning to help them prepare accordingly.

Stronger hearts

ME associate professor Nathan Sniadecki is developing new engineering approaches to unlock the potential of stem cell-derived cardiomyocytes, or cardiac muscle cells. These can be used as a source of new heart muscle cells for scientific efforts ranging from regenerative medicine to pharmacology studies to heart disease research. Sniadecki has innovated new tools and methods to measure the functional performance of stem cell-derived cardiomyocytes at the single cell and at the tissue level.

Recently, his lab has developed a tissue-engineered approach to grow cardiomyocytes in a 3D construct that beats like heart tissue and responds to pharmacological treatments and mechanical cues. This "heart-in-a-dish" platform measures the contractile force of the tissue and is used to examine new techniques to mature the cells, screen new pharmacological treatments for heart disease, and study inherited forms of heart muscle disease.





Engineering heart tissue with optical tweezers

ME and ISE assistant professor Ashis Banerjee is investigating how to develop better-engineered heart tissue using optical tweezers as a complementary technique to micro-molding or bioprinting. Optical tweezers use a highly focused laser beam to manipulate microscopic objects in three dimensions; Banerjee's team is exploring how to use them to precisely position endothelial cells on top of growing cardiomyocytes. He hopes doing so will allow his team to hierarchically assemble entire heart tissue structures artificially in vitro, leading to more efficient and reliable methods of creating better performing heart tissue overall.

Transforming tissue paper

Thanks to ME research, tissue paper can become a new kind of wearable sensor.

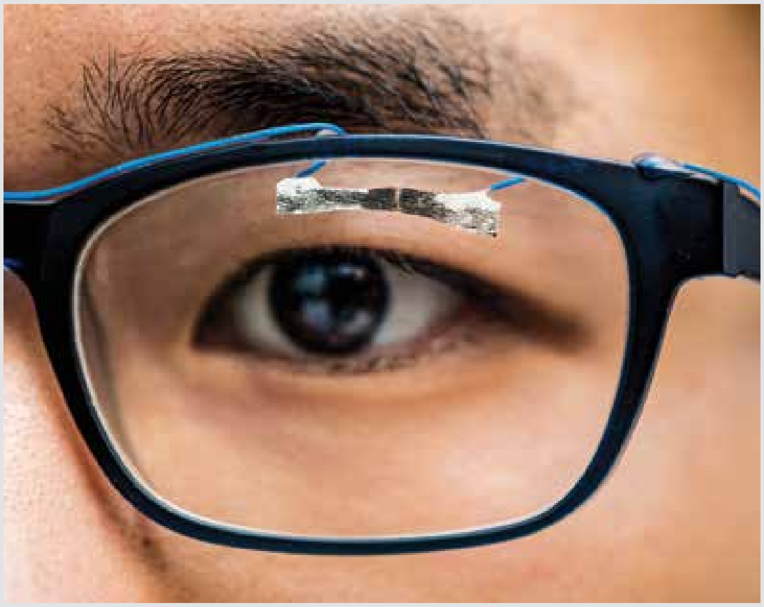
A research team led by ME associate professor Jae-Hyun Chung has turned tissue paper into a wearable sensor that can detect a pulse, a blink of an eye and other human movement. The sensor is light, flexible and inexpensive, with potential applications in health care, entertainment and robotics.

The technology shows that by tearing tissue paper loaded with nanocomposites and breaking the paper's fibers, the paper acts as a sensor. According to Chung, it can detect a heartbeat, finger force, finger movement, eyeball movement and more.

"The major innovation is a disposable wearable sensor made with cheap tissue paper," said Chung. "When we break the specimen, it will work as a sensor."

In their research, the scientists used paper similar to toilet tissue doused with carbon nanotube-laced water. Carbon nanotubes are tiny materials that create electrical conductivity. Each piece of paper has horizontal and vertical fibers; when it is torn, the direction of the tear informs the sensor of what's happened. To trace eye movement, they're attached to a person's reading glasses.

For now, the work has been contained to a laboratory. Researchers are hoping to find a suitable commercial use. A provisional patent was filed in December.



Faculty awards

Ashis Banerjee received funding from Amazon Robotics to research vision-based inference of ergonomic issues during object manipulation.

Steven Brunton and **James Riley** received College of Engineering Junior Faculty and Faculty Research Awards. The **Engineering Innovation in Health** teaching team — **Jonathan Liu, Jonathan Posner, Eric Seibel** and **Kat Steele** — won the College's Team Award.

Joyce Cooper received a World Wildlife Fund grant for sustainability benchmark research.

Santosh Devasia was appointed director of the Boeing Advanced Research Center.

Sawyer Fuller received UW Royalty Research Funding for aerial insect robotics research.

Jonathan Liu received a $1.5 million grant from the U.S. Department of Defense Prostate Cancer Research Program to develop open-top light-sheet microscopy technology to enable nondestructive 3D pathology of prostate biopsies.

Ramulu Mamidala received an Eminent Alumnus Award from Osmania University in India.

Brian Polagye and **Andy Stewart** received a $6 million Naval Facilities Engineering Command contract for research, development and testing of marine energy conversion systems and underwater robotics.

James Riley was named a fellow of the American Association for the Advancement of Science for his contributions in fluid mechanics and advancements in the understanding of turbulent flows.

Eric Seibel received a UW Undergraduate Research Mentor Award.

Duane Storti has been recognized by NVIDIA's Deep Learning Institute as a university ambassador and certified instructor for Accelerated Computing and Deep Learning for Computer Vision.

Several faculty — **Ashis Banerjee, Steven Brunton, Santosh Devasia, Joseph Garbini, Ramulu Mamidala** and **Per Reinhall** — were awarded contracts from The Boeing Company for advanced manufacturing, machine learning and robotics research.

John D. & Catherine T. MacArthur Foundation

CLIMATE RESEARCH PIONEER

ME alumna Tami Bond receives the 2018 UW College of Engineering Diamond Award for Distinguished Achievement in Academia.

College of Engineering Diamond Awards honor outstanding alumni and friends who have made significant contributions to the field of engineering. Tami Bond, '93 BSME, '00 PhD (Interdisciplinary Graduate Programs), was honored this spring for her achievements in academia.

Bond is the Nathan M. Newmark Distinguished Professor in Civil & Environmental Engineering at the University of Illinois at Urbana-Champaign. In her research, she explores the interface between energy consumption and global atmospheric chemistry with a focus on understanding physical, chemical and optical properties of carbon-containing particles and the factors that govern combustion emissions.

Among her contributions, Bond has pioneered efforts to develop a more accurate analysis of black carbon emissions and their environmental impact. Black carbon — the dark component of smoke — has been largely invisible in global climate change models. The lack of standardized measurement tools, in addition to black carbon's numerous sources — including the burning of fossil fuels in diesel engines, coal-fired power plants, and home heating and cooking — have made it difficult for scientists to measure black carbon emissions and their impact. Bond's work led to the conclusion that it is one of the most significant contributors to human-produced climate change, second only to carbon dioxide.

Her research has linked energy consumption to atmospheric chemistry through the characterization of aerosols, data collection across the globe and synthesis of existing data. Prior to her work characterizing the chemical and optical properties of aerosols, the connection between light absorption, light scattering and particle chemistry was not well understood for many sources of combustion. Bond led an interdisciplinary team to create a global data set of emissions and developed a portable measurement unit to quantify emissions from cooking stoves and small industrial sources like brick kilns in the U.S., India, Nepal and China.

Bond's work led to the conclusion that black carbon is one of the most significant contributors to human-produced climate change, second only to carbon dioxide.

Her partnership with the World Bank established a global framework to standardize measurement and analysis of black carbon emissions. Bond led a group of 30 scientists to synthesize existing literature on black carbon in the climate system across disciplines to inform policy and expose the impact of energy on our climate system. This work was the most comprehensive analysis of black carbon's effect to date, transforming the way scientists estimate global climate change.

Bond has received more than $8.3 million in grants from a broad range of funding agencies including the National Science Foundation, the Environmental Protection Agency and the Department of Energy. In 2014, she received a MacArthur "Genius" fellowship. Her contributions to engineering are significant, and we are thrilled to honor her this year.

Learn more about Bond and other 2018 Diamond Award recipients at engr.uw.edu/da

MECHANICAL ENGINEERING
UNIVERSITY of WASHINGTON

Mechanical Engineering
Box 352600
Seattle, Washington 98195-2600

Per Reinhall
Department Chair

Chelsea Yates
Assistant Director of Publications

Mary Macenka
Graphic Design

Send address corrections and comments to:
mengr@uw.edu

BE BOUNDLESS
FOR WASHINGTON | FOR THE WORLD

Visit us at **me.uw.edu**
Follow us at **facebook.com/uwmechanicalengineering**

2018 GRADUATION

We thank Steve Chisholm, ’86 BSME, for delivering the 2018 ME graduation address. As Director of Structures Engineering for Boeing Commercial Airplanes (BCA), Chisholm leads BCA Airplane Structures in support of airplane development, airplane programs, product development and in-service airplanes. He also is responsible for driving functional excellence for all Structures Design and Stress skills across BCA.

In addition to his ME degree, Chisholm holds an MBA from Seattle University. Since joining ME’s External Advisory Board in 2013, he has worked to deepen the department’s relationship with The Boeing Company by developing opportunities for Boeing engineers to collaborate with ME faculty and students.

This year ME awarded nearly 125 bachelor’s degrees, 115 master’s and 15 doctoral degrees. We were also very happy to be joined by members of the 1968 graduating class, who were honored with a 50th reunion reception and recognized during ME’s graduation ceremony.

2017–18 ME Leadership Seminar Series

Many thanks to the following alumni and friends for participating in this year’s leadership seminar series.

Doug Comstock, ’83 BSME, Director, Strategic Investment, NASA

Tracy Daly, ’95 BSME, Senior Manager, 787 Flightline Engineer, The Boeing Company

Thomas C. Easton, ’81 BSME, President ATS Automation

Doug Moore, ’80 BSME, President, McKinstry

Rob Scheibe, ’96 BSME, Principal Mechanical Engineer, GT Engineering

Teodora Rutar Shuman, ’00 PhD, PACCAR Professor and Mechanical Engineering Department Chair, Seattle University

Angela Templin, ’99 BSME, Vice President, Commissioning Authority, Glumac

Joe Williams, ’85 BSME, CEO, Elmore Electric

Mike Wilson, ’77 BSME, Owner and President, Wilson Property Services

Jon Yourkoski, ’96 BSME, Managing Director, Morgan Stanley