

MECHANICAL ENGINEERING NEWS

STUDENT PROJECTS

Design, Build, Celebrate

U of I cross-college and campus collaboration brings 150 LED triangles to Vandal Marching Band's 100th anniversary halftime performance

The University of Idaho Vandal Marching Band didn't settle for 100 candles on its birthday cake. The band's 100th anniversary included loud music, lots of dancing and bright lights — about 1,125 LEDs to be exact.

The band's Homecoming football game performance included 150 new percussion triangles that light up when played, an engineering and design feat from a half a year's worth of collaboration among three U of I colleges and hundreds of volunteers.

U of I Band Director Spencer Martin was the first to pitch the idea to the U of I College of Engineering to design a rebar triangle that could not only light up but be easily mass-produced.

Mechanical engineering and

computer science students were tasked with bringing a complete prototype to life over the short summer session as their Senior Capstone Design Project.

"Not only was the short timeframe a factor," said mechanical engineering graduate Bryce Dinger '19. "We also needed to come up with something that could be put together by volunteers who might not be engineers themselves."

Dinger said the team planned to build a tool to bend the metal, called a jig, which could cut down on triangle manufacturing time. But rebar bent cold and past a 90 degree angle cracks, forcing the team to use a torch to heat and bend the metal. Dinger said the process added about a minute and a half to the manufacturing process on both corners of the



(Top) CALS students designed belts to hold the instruments. (Left) Students and volunteers assembled the triangles.

triangle, which quickly adds up when you're creating 150 pieces.

Much of the summer was spent on the design of the handle to

make it comfortable to hold and easy to use. Band members needed to be able to hold the triangle and grab it with the same hand to mute it.

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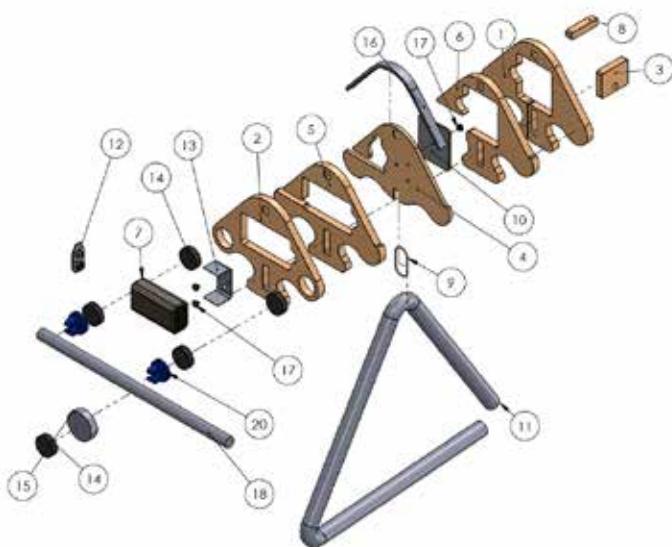
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STUDENT PROJECTS



The triangle design consists of a 5-piece handle (left). Rebar was heated to bend the triangles into shape (above).

that band members could wear to hold the triangles.

With a group of volunteers and three hours, the team had about 100 belts created.

"Even coming from very different backgrounds, from engineers and the apparel side, you can really see the similarities between how we come up with and execute a design," said engineering graduate Brock Baughman '19. "Our commitment to testing and attention to detail to create a quality product is the same."

U of I Coeur d'Alene master's graduate Nancy Ripplinger and Bob Rinker, associate professor in the U of I Department of Computer Science, designed the custom circuit boards to control the LEDs.

Ripplinger, who is also a professor at North Idaho College, developed the processor used to program each of the microprocessors installed in the boards on each triangle. Volunteers helped prep and solder components on the board.

"With so many people working on this project, we all started to think on the same wavelength," she said. "We all worked well together for a

"None of us even knew how a band member held a triangle or even used it," Dinger said. "We went through seven or eight iterations, gathering input and user experience the whole way. We put those triangles into as many band member's hands as possible."

Engineering graduate student Selso Gallegos said it took more than 20 hours to laser cut the five-piece handle in order to prep it for assembly. Marching Band members volunteered weekends to help assemble the handles using a stacking method and attaching mounts for the striker and researchable battery.

Anyone who has ever seen a Vandal Marching Band performance knows band members are very active, so holding a triangle while running across the field wasn't going to be feasible.

The team collaborated with U of I College of Agriculture and Life Sciences Apparel, Textiles and Design faculty and students to design a hip belt

'Let's Make it Happen'

Students and graduates team up to 3D print prosthetic arm for a friend after car accident

By Jake Miller, M.S.M.E.
Graduate Student

This summer, I was fishing in CDA and I ran into a buddy of mine that I grew up with and hadn't seen in years. I asked him how his family was doing and he mentioned that his little brother had lost his arm in a car accident. He said they were looking into

prosthetic limbs, but they were very expensive. They started a GoFundMe page, but it was looking tough.

The next weekend I went camping with some friends, one of which was going to school to become a prosthetics specialist. She mentioned a company called E-nable prosthetics



Alex Montes (left to right), Jacob Miller and Marshall Townsend pose for a photo with Alex's new 3D printed prosthetic arm.



that had open source designs for prosthetic limbs to 3D print.

My friend and colleague Marshall Townsend, had just gotten a personal 3D printer. I called him and asked if he would be interested in a project, to which he replied "Of course, let's make it happen!" Once we had the measurements for Alex's new arm, I sent Marshall the files and he spent a week printing out all of the pieces. We finished the arm done about 2 weeks for less than \$50.

When Alex drove up from McCall to pick up his new arm, we had there was a lot of apprehension around whether or not this arm was going to work. The arm has a mechanical mechanism that uses the bending at the elbow to pull the fingers closed, and with a few minor adjustments Alex was able to pick up a cup from the counter. The look on his face was of pure joy and something I'm sure neither Marshall nor myself will ever forget in our careers as engineers.

Since then, I have been keeping up with Alex and he has been using the arm at work to pick up and hold objects, as well as even riding a bike. He says, "I know it's not an ultimate replacement, but with this I can start practicing teaching my brain to work with an arm again."

LEARN MORE

View more photos and video of Alex using his arm online at

UIDAHO.EDU/JAKE-MILLER

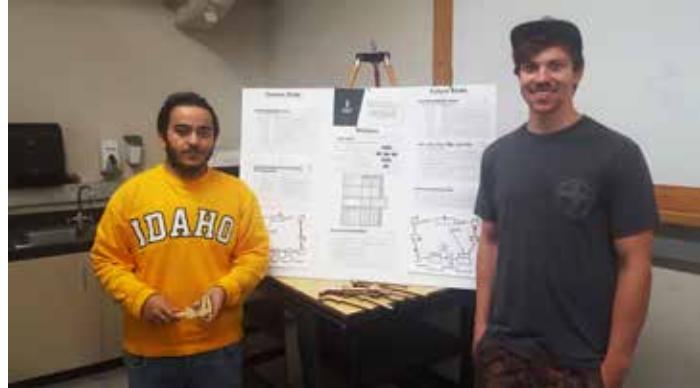
TEACHING INNOVATIONS

Lean Vandal Swag

Teams use lean manufacturing techniques to develop inexpensive promo materials

The last two summer offerings of our popular lean manufacturing course (ME 410) have featured a fun-filled project that features a limited production run of Vandal swag. Teams of 4-5 students identify a small, inexpensive promotional product that can be constructed in our machine shop at a rate of 50 units/hr. Product expectation is an attractive giveaway for tour groups or prospective students. Requirements include:

- **Manufacturing Process**
Design that uses a laser cutter, hot glue, and low cost fasteners
- **Current State Mapping** that considers order-of-operations, cycle times, scrap rates, material costs, number of workers, and inventory between stations
- **Future State Mapping** that uses lean methodologies and tools to improve quality and reduce cost for different demand rates and number of workers



Students present their finished swag during a snapshot day (above). Items included laser-cut calipers and catapults (below).

Students presented their final projects along with other course artifacts as part of a ME 410 Snapshot Day.

Our 2019 class involved more than 40 students and mentors who were highly energized by the final project. Students found the project solidified understanding of key lean-manufacturing concepts, elevated their competency as well as their confidence with local rapid prototyping equipment, and strengthened their peer-network.



ME 410 is frequently cited as a highlight in senior exit interviews.

Co-op Offers Extended Real-World Experience

Six-month session allows for full integration into industry teams

This past spring 2019, two ME students participated as the inaugural cohort of the Cooperative Education Program. Colin Parke and Alexander Kiss both served as Co-op employees at BorgWarner in Ithaca, New York, from January 2019 into the summer months.

This experience provided them with a valuable opportunity to work in a real-world engineering environment for an extended period of time (twice as long as a traditional internship). During their time at BorgWarner, the students were fully integrated into the engineering staff and became productive members of the team as they pursued a variety of projects ranging from electric vehicle modeling and data analysis to design of experiments

and graphical user interfaces.

"By doing a co-op and performing my duties well, I've increased my chances of working at the same company or another one in the future. My colleagues/supervisors have seen my capabilities and worth ethic, so they have 'vetted' me and can recommend me to an employer."

– Alexander Kiss, Co-op Student, BorgWarner

READ MORE ONLINE

UIDAHO.EDU/CO-OP

Clean Snowmobile Team Takes Fourth

Powerful two-stroke takes second in fuel economy, service emissions and object handling

The Clean Snowmobile Challenge (CSC) team has competed in the SAE Clean Snowmobile Challenge since 2001 to produce a more environmentally friendly snowmobile. Last March, Idaho faced off against 21 other universities in Houghton, Michigan, in events ranging from acceleration and fuel-economy to in-lab emissions and sound testing.

Once again, the Vandals brought a powerful two-stroke, which goes against the typical four-stroke choice of most schools but fits more in line with consumer demand. This tradition is all about impacting the industry by engineering a vehicle that people enjoy riding.



Overall, the team placed fourth out of 13 gasoline snowmobiles. Highlights of Idaho's achievements include second-place finishes in fuel economy, in-service emissions, and object handling, as well as first-place in the oral presentation.

The main challenge at the competition was the drive-by sound test, which was only



passed by two gasoline sleds. In the in-lab emissions event, which is notoriously difficult for two-strokes, Idaho was just three points shy of the E-score minimum of 175.

This year, the team is eager to hammer out the issues from the past competition and shoot for first, driven by hungry seniors and a fresh batch of first-year members.

Congratulations ME Advisory Board Scholarship Recipients!

Chance Scripter
Hector Magana

Congratulations Spring 2019 ME Outstanding Senior Award Winners!

Emily Chambers
Nicholas Sentieri
Taylor Spence

LEARN MORE
[UIDAHO.EDU/
ENGR-AWARDS](http://uidaho.edu/engr-awards)

Top Four In GCSP Global Summit

*Interdisciplinary
team places top 4 in
competition organized by
the National Academy of
Engineering*

Trash2Gas, an interdisciplinary team of six undergraduate engineering researchers mentored by mechanical engineering assistant professor Daniel Robertson have had their fair share of success over the past six months.

Winning over \$5,000 at the Idaho Pitch Competition and securing an \$18,000 grant from the Idaho Space Grant Consortium, the team plans to bring anaerobic digestion into local sixth through 12th grade classrooms.

Anaerobic digestion is the process of turning organic waste products like food and grass clippings into usable biogas



and liquid fertilizer. The biogas can in turn be used to generate electricity or run a BBQ grill.

By having a digester in the classroom, students can literally see the process take place, bringing life to a curriculum focused on sustainable practices and waste management.

The planned digester would include devices to measure the biogas output, so students could see the energy they are creating.

The interdisciplinary team of engineering students includes Anson Lunstrum, Kaitlyn Lindholm, Devin Richards, Kenny

UNDERGRADUATE NEWS

Sheffler, Holly Terrill and Bishal Thapa.

After competing in a nation-wide entrepreneurship competition, they were selected by the U.S. National Academy of Engineering to represent the United States at the International Grand Challenges Summit 2019. The summit was held in London and was jointly organized by the National Academies of Engineering from the United Kingdom, China, and the United States.

The event convened inspirational world leaders with the next generation of engineers and change-makers to build creative collaborations and solve the grand challenges facing our future world of 10 billion people. As part of the summit, students were split up into mixed country teams which included students from China and the UK and participated in a 48-hour hackathon focused on developing sustainable solutions to Engineering Grand Challenges. The students performed well with two of the four who were in attendance making it into the final rounds of the competition.

"Students put their skills against top students from around the world and worked with those same students to develop solutions to engineering challenges facing society," said Robertson. "These are the kinds of doors that a Vandal education can open. It's more than just textbooks and a high GPA, it's about being a force for good to change our world for the better."

Anson Lunstrum Receives Frank Wesley IV Memorial Scholarship

By Anson Lunstrum

I chose to study engineering because I have always had a profound curiosity about how tools work and how I can use them to help others. When I discovered the Grand Challenge Scholars Program (GCSP), I joined and chose a focus area of sustainability because it is the largest issue I believe humanity currently faces. After studying abroad in China, my motivations were redoubled, and I started to ask myself what solutions to this problem could reasonably be accomplished before graduating.

With a group of my peers, we developed a business plan focused on developing a curriculum for sixth through 12th-grade students, centered around food waste reduction and recycling. In my remaining time at U of I and after, I intend to focus on improving waste management and resource extraction, and continue to develop a small business plan in order to achieve this in the short-term.

“ I chose to study engineering because I have always had a profound curiosity about how tools work and how I can use them to help others.

— ANSON LUNSTRUM,
Senior, Mechanical Engineering

”

ABOUT THE FRANK WESLEY IV MEMORIAL SCHOLARSHIP

Frank Wesley IV was 22 years old and had just started a promising career in nuclear engineering when he was killed in an automobile accident. An endowment in his name was established by his parents in memory of Wesley to assist promising undergraduate mechanical engineering students, encourage support of others and to recognize excellence in all aspects of life.

GRADUATE STUDENT NEWS

Paulo Yu Earns ASME Graduate Teaching Fellowship

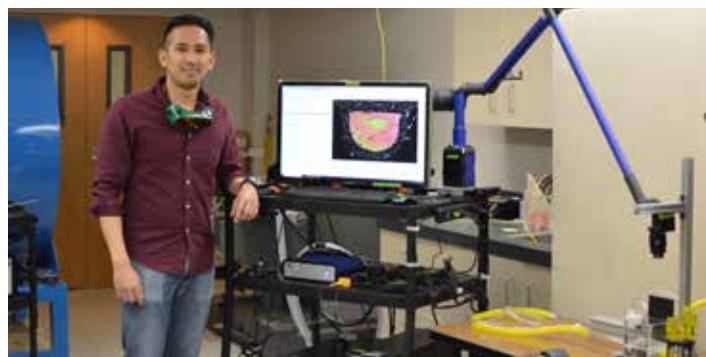
Paulo Yu, a second-year doctoral student studying mechanical engineering, has been awarded an American Society of Mechanical Engineers Graduate Teaching Fellowship. As one of the requirements of the fellowship, Yu, is teaching Experimental Methods for Engineers (ME 330). This course addresses probability and statistics, uncertainty analysis, different measurement systems, and introduction to data acquisition and data analysis.

"Paulo is one of the outstanding Ph.D. researchers in the department in experimental biofluids and advanced data analysis," said Yu's faculty advisor,

Vibhav Durgesh. "Paulo plans to pursue a career in academia, and the ASME fellowship will help him achieve his long-term career goals."

As part of the requirements of the fellowship, Yu is teaching Experimental Methods for Engineers (ME 330) with a lab portion. The junior-level mechanical engineering course covers a wide range of topics, including probability and statistics, uncertainty analysis, introduction to different measurement systems, introduction to data acquisitions and data analysis.

Yu's doctoral program focuses on



Paulo Yu uses the department's new 2D Particle Image Velocimetry system to study flow behavior of biofluids inside an aneurysm.

experimental fluid dynamics. His research focuses on flow behavior of biofluids inside an aneurysm. He expects that the results of his work "will be

beneficial in designing and optimizing treatment methods and efficient clinical procedures when treating aneurysms."

International Graduate Student Highlight

Jubin George, M.S., Mechanical Engineering

Jubin was born in Abu Dhabi, United Arab Emirates, and raised in Abu Dhabi till high school. After finishing high school in Abu Dhabi, he moved to Pune, India, to complete a bachelors in mechanical engineering.

After graduation, he worked with Ajad Facilities Management as a junior mechanical engineer in Abu Dhabi, UAE focused on providing electro-mechanical solutions in commercial and residential buildings.

Jubin George came to the University of Idaho through the Navitas Program, a private program that assists international graduate students in integrating into graduate education in the U.S. After one year in the Navitas

program, Jubin was invited by professor Ralph Budwig and assistant research professor Damon Woods to join a research project at the U of I Integrated Design Lab in Boise. He expects to graduate in December 2019 with research on an Avista- sponsored project to learn how to better control HVAC systems, improve occupant thermal comfort and reduce peak loads, using surface temperatures as measured with an IR camera.

"Cultural shock is something all international students face during the first few months. The campus culture at U of I is very welcoming and supports international student needs. I have been fortunate enough to work with different parts of the



university and have met many local residents."

Jubin loves the outdoors and thinks Idaho is one of the best

states in the U.S. for outdoor recreation. He tries not to miss any chance to explore and has backpacked, camped and done several road trips with friends.

Congratulations Spring 2019 Mechanical Engineering Outstanding Graduate Student Award Winner! PARKER HILL
M.S., Fall 2019

Graduate Student Highlight

Austin Anderson, M.S., Mechanical Engineering

By Austin Anderson

Growing up in the small town of Kettle Falls, Washington, from a young age, complex equipment and heavy machineries fascinated me. Some of my favorite memories were spending time with my forester dad watching logging equipment take down massive trees with ease. I decided then that when I grew up, I wanted to harness the power of machines.

In high school, my school was fortunate enough to have a robotics team that designed and built robots for competition with other schools nationwide. This

experience was my first exposure to engineering work and reiterated to me the wonders of technology, and ways we could use them to accomplish complex tasks. Although our team did not make it to the world championships, I discovered my passion for engineering.

When it came time to pick on a school to continue my education, I was torn between several different schools. Ultimately, I decided on the University of Idaho due to its prestigious reputation within the northwest. I was also the third generation of my family to attend school in Moscow.

As I progressed through my undergraduate education, I developed a strong interest in the thermal fluid sciences. My interest in these subjects was put to practical use when I received an internship working with natural gas and biomass electrical power plants.

Going into my senior year of school, I decided that I had plenty left in the tank when it came to academics, and therefore I began to pursue graduate education options. My fascination with sustainable technology led to my current thesis project, where I have been researching cold thermal

energy storage as a means of reducing energy consumption and improving the efficiency of cooling systems. My work has focused on using software for modeling the University of Idaho district cooling system with the goal of optimizing its performance.

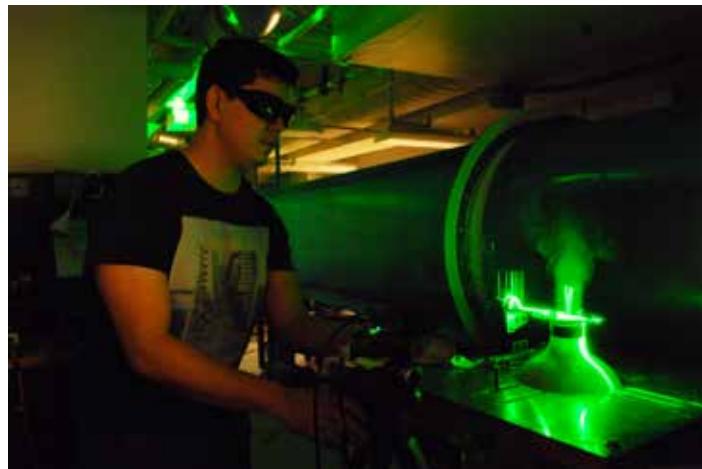
Deciding to get my master's degree has been a challenging and rewarding experience. In this program I have already published a peer reviewed journal article and have two others submitted. As I progress in my career as an engineer, I plan to continue to pursue my passion for enhancing the efficiency of energy systems.

INFRASTRUCTURE IMPROVEMENTS

Lab Adds Particle Image Velocimetry (PIV) System

The Experimental Fluid Dynamics Laboratory (EFDL) acquired a 2-D Particle Image Velocimetry (PIV) system during the summer of 2019. PIV is a non-intrusive, optical measurement technique that provides instantaneous velocity fields. The PIV technique has numerous applications in fundamental and industrial fluids research, wind tunnel testing, biofluids research, airfoil aerodynamics, studying flow over automobiles and trucks, and validation of computational flow simulations.

For PIV measurements, the displacement of atomized particles in a flow is illuminated using a pulse laser system. The images of scattered light from the particles are recorded using a high-sensitivity double-frame



(Above) Mechanical engineering graduate student Rodrigo Padilla compiles lift and drag measurements using the new PIV system that allows users to visualize particles around a moving membrane (right).

CCD camera. The consecutively recorded images are used to track the displacement of the

atomized particles and estimate the velocity vector for the studied flow. Figure 1 shows a typical



PIV image, this experiment was performed in the EFDL to study the aerodynamics of a flexible airfoil in a uniform jet flow.

Students Design High Temperature/Pressure Fatigue Testing Apparatus

Department saves thousands on equipment enhancement and capabilities

In 2016, U of I faculty members from mechanical engineering, materials science, and chemical engineering were awarded a Nuclear Energy University Programs (NEUP) Infrastructure grant to enhance U of I's environmental fatigue testing capabilities. Professor Bob Stephens was the primary recipient of the award and was tasked with development of the laboratory facilities.

Instead of buying a load frame and controller from a vendor, Dr. Stephens chose to sponsor a ME424/426 senior capstone design project and tasked the team to design, construct, and test the system prior to their departure. The final cost for the load frame/controller was on the order of \$25,000, while the original budget for the components was earmarked for nearly \$100,000.

"The great part about this is that it provided a group of ME seniors an excellent capstone experience while at the same time saving us a significant amount of money that we then sunk into the purchase of other key components for the entire assembly," Dr. Stephens said. Master's graduate Nick Shaber '19 was a key mentor for the design project, and his wealth of knowledge from working in Bob's lab the previous year and a half was invaluable.

Graduate student Colin Burkhalter has been tasked with bringing the entire system together and has already performed a couple of preliminary tests. The complete apparatus is designed to perform fatigue and corrosion tests at high temperature and pressure using a high purification water circulation loop. Temperatures can exceed 500°F and pressures up to 3,000 psi.



Graduate student Colin Burkhalter demonstrates the apparatus designed to perform fatigue and corrosion tests at high temperature and pressure using a high purification water circulation loop.

"Implementation of the entire system has been challenging as there are a lot of idiosyncrasies associated with the loading frame, autoclave, heating and cooling components, and that we basically have a pressure vessel with very hot water," said Dr. Stephens. "So testing is one thing, but safety is a whole other matter. It is believed there is only one other piece of equipment like this west of the Mississippi so we are excited to get this up and running."

INFRASTRUCTURE IMPROVEMENTS

New Manual Lathes Installed



Acra precision engine lathes (left) were installed to replace 50-year-old manual lathes (above).

Thanks to the generous donations from our industry partners and alumni, we have been able to replace our 50-year-old lathes with some brand new ones. The fund began with Wagstaff Inc.'s generous contribution and continued support continued through a dollar-for-dollar match to contributions made

from employees. Schweitzer Engineering Laboratories, Western Trailers as well as several individual donors, contributed additional support.

The new lathes installed immediately following the end of the spring semester so

they would be available for the ME 410 Lean Manufacturing course in the summer. The new machines feature safety improvements such as a foot-operated brake and a chuck guard interlock as well as digital readouts for accurate positioning.

The ME 410 class had the first opportunity to use them and there was a noticeable improvement in quality and efficiency during the production of Block Project components. There were also numerous Kaizen projects centered on the new machines such as improved storage, and updates to online tips and tricks.

FACULTY AND STAFF

BLUE SABINO Manufacturing

One-of-a-kind major research instrumentation project taking shape

U of I's Department of Mechanical Engineering offers unique learning opportunities and is a great place to engage in research. While some graduate students work with cutting-edge tools, others get to build them. Mechanical engineering faculty researchers

Joel Perry and Eric Wolbrecht, together with graduate students and ME machine shop supervisor Bill Magnie, are adding one more distinguishing trait to the mechanical engineering department's tool



Joel
Perry



Eric
Wolbrecht



Bill
Magnie

belt: a two-arm robotic exoskeleton instrument that performs bilateral functional assessment of the upper extremities (i.e., arms and hands).

The culmination of a 5-year \$1.4M

NSF Major Research Instrumentation project, the BiLateral Upper-limb Exoskeleton for Simultaneous Assessment of Biomechanics and Neuromuscular Output, BLUE SABINO, is starting

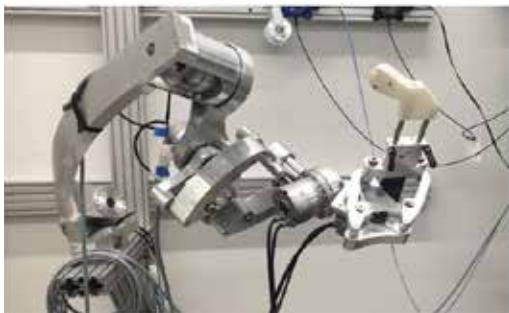
to take shape. Once complete, it will be the only instrument of its kind in the world, extending simultaneous measurement of human movement during real tasks to the full arm and hand complex while capturing data from the central and peripheral nervous systems via EEG and EMG measurement.

This summer, linkages that connect the first five degrees of freedom (DOFs or joints) of the system were manufactured in the ME machine shop. The 5-DOF version essentially

forms an exoskeleton structure that surrounds a user's arm from the shoulder to the wrist. Once properly adjusted, the design allows the robot to move with the user and maintain alignment between each exoskeleton joint and a corresponding joint on the user.

Interactions between the exoskeleton and user are currently measured by two 6-axis force/torque sensors that quickly and accurately monitor initiated movements of the user's hand and forearm. When measurement,

FACULTY AND STAFF



calculation, and motor commands are performed at a sufficiently high rate (~ 1000 Hz), the exoskeleton can effectively be used as an assessment instrument to measure user mobility, or provide assistive support forces.

BLUE SABINO realization has been the topic of several Master's degrees already and will support several more before completion. The 5-DOF assembly shown in Figure 2 represents contributions from current students (Chris Bitikofer, Tony Branz, Rene Maura, Melissa Bogert, and Sebastian Rueda-Parra), and past students (Parker Hill, Shawn Trimble, Jeremiah Schroeder, and Nick Butler). In total, the final system will be composed of 30 powered degrees of freedom, 6 unpowered DOFs, and several additional lockable joints for size adjustability. The BLUE SABINO instrument is scheduled for completion in 2021, but even it is providing a valuable platform for learning more

about how we can monitor, quantify, and improve function in the arms and hands.

“ This device will allow us to explore potential areas and get more information than we ever could before using simpler systems.

— **Joel Perry**
Associate Professor,
Mechanical Engineering **”**

Outstanding Early Career Faculty: Daniel Robertson

Daniel Robertson is a multidisciplinary scientist with expertise in biomechanics, plant science and interdisciplinary design. His teaching and research efforts are focused on using engineering principles to accomplish what the White House has called the great challenge of the 21st century: sustainably providing food, fuel and fiber for the world's growing population.



Daniel
Robertson

engineering license and directed

Since arriving in Idaho, Dr. Robertson has developed three new courses, founded the AgMEQ laboratory, acquired a professional engineering license and directed

the design and development of the NAE Grand Challenge Scholars Program, which has been a magnet for recruiting outstanding students to the College of Engineering. Under his leadership, the Grand Challenge Scholars Program has quadrupled in size and outcomes produced at the University of Idaho have been recognized in national meetings for the directors of NAE Grand Challenge Scholars Program.

Faculty Honored for Excellence in Respiratory Health

Four receive Excellence in Interdisciplinary and Collaborative Efforts Award

Four faculty members including two from ME, Dr. Tao Xing (2nd from the left) and Dr. Gabriel Potirniche (2nd from the right), have been chosen as the recipients of the 2019 University of Idaho Excellence in Interdisciplinary and Collaborative Efforts Award for their work to promote respiratory health through the development of next generation flow ventilators. The award was established to honor faculty members who exemplify interdisciplinary and collaborative efforts and must have contributed to substantial and lasting connections to people, units, programs or departments within the University of Idaho.

Congratulations to ME Faculty on Promotions!

DAN CORDON

Promoted to Clinical Associate Professor

JOEL PERRY

Promoted to Associate Professor

A TRIBUTE TO

RICHARD T JACOBSEN

In honor of a past U of I College of Engineering alumnus, professor, chair and dean

Richard Jacobsen (affectionately known as “Jake”), former dean of the University of Idaho College of Engineering, passed away Tuesday, Aug. 20. He earned a Bachelor of Science from the U of I in 1963 and a Master of Science in 1965. After completing his doctorate, he joined the U of I faculty and climbed through the academic ranks to professor, chair of the mechanical engineering department, associate dean of research, and later, dean of the College of Engineering from 1990-99.

While at the U of I, he was responsible for more than \$12 million in grants and contracts. Most of the awards were for research on thermophysical properties for a wide range of fluids and mixtures. Having enjoyed a distinguished career, his most important priority was his role as a loving husband, father, grandfather, son, and friend.



Richard
Jacobsen

MEMORIES FROM FRIENDS AND COLLEAGUES

Richard T Jacobsen was a mentor, certainly of extraordinary character, and a good man in all senses. My first interactions with “Jake” were during his tenure as department chair of Mechanical Engineering. Jake was an influential member of the college’s Engineering Executive Committee member and provided valuable advice and input to the various Deans that he served. Jake had an especially strong relationship with Associate Dean George Russell and it remains a fond memory for me to think of Jake and George walking the halls of the Jansen Engineering Building sharing aspirations for the College.

— **PATTY HOULE**, COE Administrative Staff 1981-1995, Human Resources Staff 1995-1998, Provost’s Office 1998-2010

I first worked with Jake when I first transferred to Boise and then he appointed me to be the director of our program. We continued to work together while he was at the INL and later ISU. Despite these later career assignments, his heart was always with the U of I. The biggest impression Jake made on me was his passion for cooperation. Whether we were strategizing how to deliver a program with BSU, establish a research project with the INL, or co-teach a class with ISU he was always about cooperation.

— **LARRY STAUFFER**, U of I ME faculty member 1987-present, COE Dean 2011-present

During our senior year one of the capstone projects available to our group was to design for installation an earth coupled heat pump system for a home. At the time this was a pretty new and unusual concept. Richard had the idea that his house in Moscow would be the perfect experiment/implementation site. To me, the idea that ME Department Chair would entrust his precious home for this conversion spoke volumes to me about his faith in his students and their ability to deliver on a critical project.

— **TODD SWANSTROM**, BSME 1985, ME Advisory Board 2009-present, Director of Engineering at Western Trailer

“ I have truly never had a job I didn’t like. The changing atmosphere in the engineering profession has provided challenges and opportunities over these many years. The most significant reward of my academic career has been helping young people prepare for professional careers in engineering practice.

— **JAKE**

”

I knew Jake as an outstanding researcher for many years before he hired me in 1989. We worked together until he stepped down as dean of the college. Jake was an excellent mentor and was committed to helping others. Not only was he my boss, but he also became a good friend and much of what I am today is because of him. As an example of his willingness to help, Jake served on the doctoral committee for my husband Gregg. Gregg has often commented on how much Jake’s input meant to him and that his dissertation was better because of Jake’s commitment.

— **JEAN TEASDALE**, BS Accounting 1978, MS Computer Science 1986, PhD Educational Administration 1990, U of I Employee 1978-2009, COE Director/Assistant Dean of Administrative Services 1990-2009, Idaho SpaceGrant Consortium Assistant Director/Director 1994-2009



Richard Jacobsen in center of second row.

Jake was ME department chair when I was hired and I remember him and George Simmons taking me to a fancy restaurant in downtown Moscow. I remember asking about the applicant pool and the competition. Jake jokingly said it was mostly "truck drivers from Boise." At any rate, Jake pretty much offered me the job on the spot while I was in Moscow. Clark Lemmon was hired as the new ME chair before I began at the University and Jake moved on to become the Associate Dean. I distinctly remember Jake's leadership in launching a branch engineering program at BSU and later as the education director at INL.

— **RALPH BUDWIG**, U of I Faculty member 1986-present, ME Department Chair 1999-2005

I worked with Dick Jacobsen for most of his time as Dean of Engineering. I was Department Chair of Chemical Engineering, which allowed me to frequently meet and occasionally travel with Jake. I greatly admire Jake for his constant and effective promotion of our College. Also, I greatly admire him for maintaining a high quality thermodynamics research program even while dean of engineering.

Jake had good intuition about what was best for the University of Idaho and for our college. He was the most successful Dean during my forty years at the University of Idaho.

— **ROGER KORUS**, U of I faculty member 1978-2009, CHE chair 1982-1983, 1985-1998, and 2005-2009

Jake invited me to become part of the Center for Thermodynamic Studies (CATS) when I joined the university in 1987. Personally, it provided excellent professional preparation and personal growth reflected in memories shared by others. What I found most intriguing was the fellowship of a small army of graduate students and undergraduate research assistants that we employed to help us with our equation of state work. This was an essential part of Jake's vision for CATS and is a source of my beliefs about the significance of learning environment design in engineering education.

Jake's enthusiasm for faculty/student as well as student/student mentoring encouraged many CATS members to successfully pursue graduate degrees. It is heartening that the Jacobsen family has initiated an endowment to support an undergraduate research assistantship award.

— **STEVE BEYERLEIN**, U of I faculty member 1987-present, ME Department chair 2015-present

RICHARD T AND BONNIE L. JACOBSEN SCHOLARS IN ENGINEERING ENDOWMENT

The Richard T and Bonnie L. Jacobsen Scholars in Engineering Endowment is established by Bonnie Jacobsen, family, friends and colleagues in honor of the significant contributions to engineering



Bonnie and Richard Jacobsen

achievement, leadership, engineering education and service to the profession and society by Professor Richard Jacobsen. One or more Jacobsen Scholars shall be selected each year. Funds will provide full-time undergraduate engineering students with the opportunity to work with a faculty mentor as a paid research assistant. Research projects will be supported in all engineering disciplines and must offer learning opportunities not available through conventional classroom instruction.

A TRIBUTE TO RICHARD T JACOBSEN

MEMORIES FROM FRIENDS AND COLLEAGUES

I had the honor of knowing Dick (Jake) Jacobsen in several roles. He was one of my professors during my doctoral studies at the U of I, he was a mentor during my career in academia, a colleague in research and university administration, and perhaps most importantly, a good friend. Jake taught me many things including what needs to be done to achieve tenure and promotion at a major university, what role we play in service to our professional societies, and what it means to be a servant leader.

From a professional perspective, the thing I always admired about Jake was his ability to be an effective administrator. He navigated us through two difficult issues during my tenure as ME Department chair; the role that the U of I College of Engineering would play in Boise, and getting the Engineering-Physics Building built. I spent a lot of time with Jake during these difficult times, and I never saw him get mad or upset.

On a more personal note, the man had an infectious Snidley Whiplash laugh. When we would get to laughing, it just kept getting harder and harder to stop because of his laugh. So many times, I remember him finally getting rid of the giggles, and wiping his eyes. I ended up holding my stomach because it hurt from laughing so hard.

- STEVE PENONCELLO, PhD Mechanical Engineering 1986, ME Faculty Member 1990-2015, ME Department Chair 1995-1999, COE Associate Dean for Research 1999-2004, CATS Director 2000-2015

Jake knew how to find the good restaurants, and all business trips with him were great. I remember hauling along "laptop" computers that were as big as a suitcase and weighed more. When we were not engaged in formal meetings and dinner get-togethers, we sat in the hotel room and fitted equations of state. There was no idleness to Jake.

Particularly memorable were my experiences writing papers with Jake. I was lousy at it, but he was so patient and taught me to write well. We would go in his office with a manuscript, divide the paper into fourths, Jake would take the first quarter, Steve P. the second, Steve B. the third, and I the fourth. We would then all read our section and pass each page to the next person until everyone had read every page. My edits would be small, but his usually covered the page with red ink! I'd make the changes and we'd do this again and again until he was satisfied that the paper was finished. Since then, the methods he taught me have been passed down from me to dozens of students that I have advised.



Richard Jacobsen (left) poses with Dean Larry Stauffer after being inducted into the 2012 U of I Academy of Engineers.

One of his comical traits was the wad of 20 dollars bills he always kept in his pocket with a nice retainer clip. Whenever someone would come into the office and he realized they needed a little bit of help, he would whip out that wad of cash, pull out a couple of 20's, and pass them along. There was never any hesitation; he was very generous with his money.

- ERIC LEMMON, MSME 1991, PhD 1996, NIST Mechanical Engineer 1996-present

Richard Jacobsen was the Dean of the College of Engineering when I was hired as an Assistant Professor in Idaho Falls in 1994. Even though I was not on the main campus, Jake made sure that I felt like I was part of the College. A large portion of my doctoral dissertation involved concepts from thermodynamics, and it was great talking shop with him and discussing research ideas. We stayed in contact after he moved to Idaho Falls and became the Chief Scientist at the Idaho National Laboratory. Every so often he popped his head into my office and asked if there was a graduate committee he could serve on.

- JOHN CREPEAU, U of I faculty member 1994-present, ME Chair 2009-2015, COE Associate Dean for Undergraduates 2017-present

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