

Report from Ralph Budwig at the University of Idaho Boise Water Center

The Streamlab in the Idaho Water Center is a popular destination for STEM tours in Boise. We talk visitors through the StreamLab (informal tours) several times a week, but we also have major events lasting one-half to one full day, as shown in the table below. Bob Basham, the Lab Engineer in Boise, helps with many of these.



Ralph Budwig explaining the flume and wave projects to Osher Lifelong Learners.

Major StreamLab Outreach Events

(March 2016 – February 2017)

DATE	NUMBER OF VISITORS	VISITOR AFFILIATION
March 3, 2016	22	Legislative Spouses
April 7	150	Sage Valley Middle School AVID students
July 18	15	First Robotics team, middle and high school students
July 29	8	Idaho Space Academy Scholars, high school students
September 14	32	ASHRAE Idaho Chapter monthly meeting
October 5	24	Idaho Joint Financial Appropriations Committee members
October 17	28	Hillside Junior High AVID students
November 11	65	Osher Lifelong Learners
November 17	43	StreamLab Open House; visitors from agencies, companies, schools and general public
November 21	18	CWI science students
December 14	65	Leadership Boise members
February 3, 2017	200	Boise River Park Phase II wave device physical modeling

Do not miss this exciting one-minute video by Maria Ortega which shows the flume in action at <https://vimeo.com/202298198>.

Lab researchers are in the middle of a Boise River Park 2 project with a quarter-scale model of the wave device that is planned for the Boise River. This wave-making device will be installed in the river just downstream of the footbridge that crosses the river at the new Esther Simplot Park. The wave-making device and an upgrade to the Farmers Union canal diversion are in the design stages. Scott Shipley of S20 (from Boulder, CO) is lead wave device designer, McMillian and Jacobs Associates of Boise will be doing the engineering design of the river installation, and Ralph Budwig is in charge of StreamLab physical modeling.

- The following email feedback from the College of Western Idaho group captures many common reflections about the impact of StreamLab tours and events:
- I wanted to say thank you so much for the presentation and tour this past week. I got great feedback from students. We had a wrap-up session over tacos afterward and several students were saying they were inspired to go on in school after seeing the center.
- Another current BSU student (CWI alum) said to me afterward, "Now I know why I need to get good grades. I want to do cool stuff like that." Another said they felt a greater degree of security about their choice to pursue hydrology.
- I just wanted to say thank you for the invite to the Ecohydraulics stream lab today. That machine is awesome. I've been struggling with which science field I want to pursue once I leave CWI (please get me out of Finance!) and everything seems to be pushing me towards geoscience/hydrology. Getting the opportunity to see some of these things first hand has been extremely helpful.

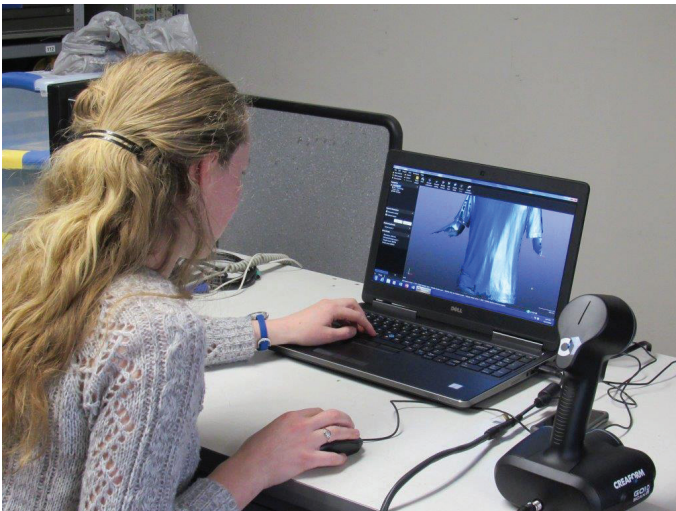
LEARNING ENVIRONMENT IMPROVEMENTS

New 3D Scanners get Constant Use

(Autumn Pratt, Jennifer Downen and Edwin Odom)

In 2016 the University of Idaho's Mechanical Engineering Department procured a pair of portable 3D scanners. These devices—Go!SCAN models 50 and 20, manufactured by CREAFORM—use the triangulation of structured light patterns to convert real-world objects into 3D point clouds. Students can then convert the data into CAD for analysis. One of the scanners can image objects up to the size of a car, while the other can resolve smaller objects with 1 mm accuracy. Both scanners have been used for capstone design projects, and their use continues to grow. There is particular interest in using these metrology tools to enhance collaboration between other departments across campus.

One recent project used the 3D scanner to create personalized mannequins for clothing and textile students making costumes for School of Music performers. A process was created to build the mannequins inexpensively out of cardboard and foam. Click here to see the entire process: <http://autumngael.wixsite.com/portfolio/mannequins>. After scanning the human, a mannequin of each performer was created for use by the costumers. This eliminated the need for multiple fittings on the person.



Autumn Pratt takes the scanner information to image mannequins for the UI Department of Apparel, Textiles & Design.

Robotic Manufacturing Cell Ready for Next Generation Projects

(Bridger Hopkins and Steve Beyerlein)

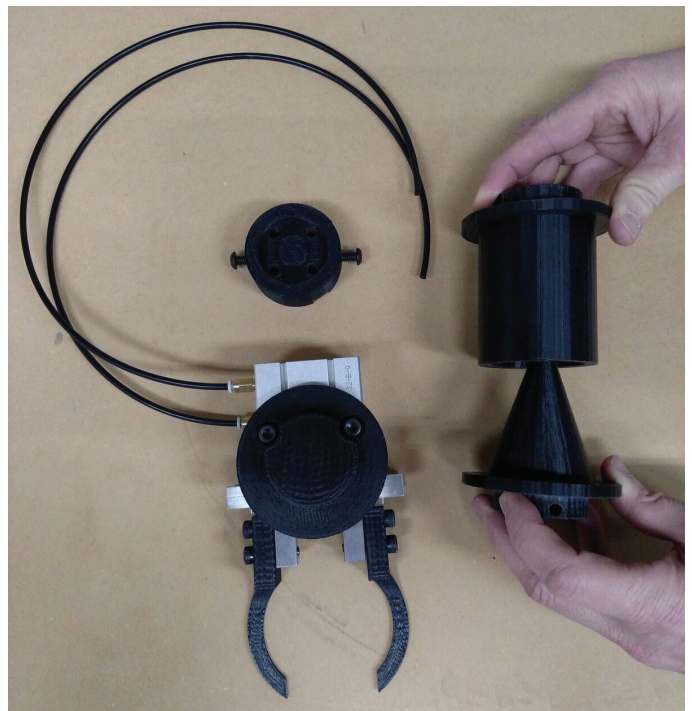
Team Do-All Robotics worked over the 2016 Summer/Fall to revitalize the robotic workcell in the southeast corner of the Senior Design Suite. The scope of the project was to improve user access, facilitate reconfiguration for different projects, incorporate a second robot for collaborative operations, and generate reference materials for future users. The cell now features a free-standing enclosure with sliding doors, two heavy-duty robot pedestals, modular tables that can be easily rearranged around the robot pedestals, quick changeover end-effector interface, storage racks for the two controllers, and a quick-start Denso/workcell manual.

The robots use a handshaking process to exchange control during combined operation. Customized end effectors were 3D printed for writing and stacking demonstrations that can be used to showcase precision positioning. We are thankful for The Boeing Company's donation of the robots and workcell remodeling funds from a generous alumna. The facility is now available for medium-duty automation projects. Keep this capability in mind if your organization is in a position to sponsor future capstone design projects.

As we move forward, we anticipate using the workcell to support a new technical elective in industrial automation. The cell is expandable and could incorporate all four Denso robots we inherited in an assembly line application.



Bridger Hopkins working with one of the robots.



End effector parts were 3D printed. The tool on the right will allow robots to synchronize in space.

LEARNING ENVIRONMENT IMPROVEMENTS continued

EP 103 Redesign

(Michael Maughan)

Begun in the last ME Newsletter, here is part two of the renovation story of Engineering-Physics (EP) room 103. As mentioned earlier, EP 103 is a multi-purpose room used for teaching and fabrications needs for freshman and sophomore design courses. Prior to the summer of 2016, the room had never been updated. At that time, new tables and lighting were added to the room, along with various multimedia tools and replacement items. The room was painted and cleaned. Over winter break of the 2016/2017 school year, a new floor was installed to create a bright new appearance, and new rolling chairs provide a comfortable place for students to solve design challenges.

The result of this investment is a signature space for our freshman and sophomore level courses. The continuing emphasis on design throughout the curriculum is sure to maintain the department's leadership in design engineering education.



side-by-side Before and after—EP103 northwest corner.

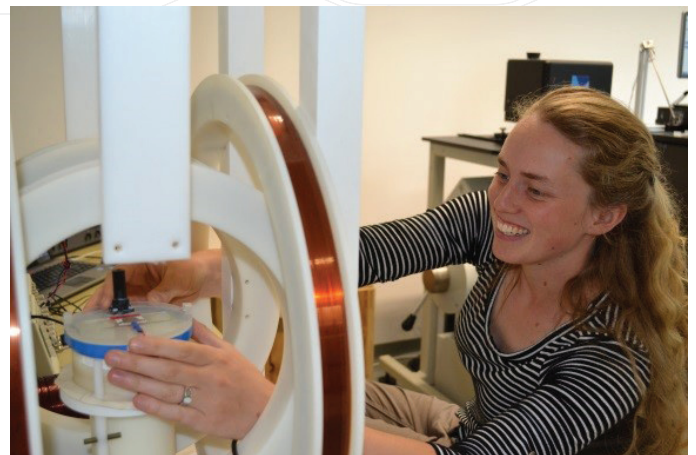


side-by-side Before and after—EP103 south wall.

STUDENT AWARDS AND ACTIVITIES

A senior in Mechanical Engineering, Autumn Pratt was one of 55 students recognized as outstanding by the University of Idaho Office of Alumni Relations. Selected students have demonstrated leadership (in classroom, laboratory, on campus and/or in the community), career and professional preparation, as well as outstanding academic success. Students were honored at the annual Awards for Excellence celebration in December.

From Autumn: I grew up in Sanders, ID, living in a wall-tent, homeschooling, and raising goats, which was a very pleasant way to be a kid. In ninth grade I moved to Moscow to attend high school at Logos, where I became very interested in math and physics. I stayed in Moscow for college because I like the area, the engineering school at UI is good, and Maria Pregitzer was really nice at the info meeting. I've been very pleased with my choice: the ME department is organized and friendly, and everyone knows each other. The students around me work hard and encourage me, and I've learned a lot. I plan to continue to grad school next year, with a particular interest in biologically inspired engineering. I haven't decided yet where I'll enroll, but I've been accepted to Cornell, Oregon State University, and Virginia Tech.



Autumn spent summer 2016 in Hannover, Germany, on an internship at Leibniz University working with a PhD candidate on her research of paper-based electronics. Autumn's task was to create demo applications for a rotation sensor.

STUDENT AWARDS AND ACTIVITIES CONT.

Grand Challenge Pitch

The National Academy of Engineering has identified 14 Grand Challenges to enhance the areas of sustainability, security, health, and joy of living: <https://www.uidaho.edu/grandchallenges>

The vision of the Grand Challenge Scholars Program (UIGCSP) at the University of Idaho is to establish a model to educate forward-thinking engineers. Each student participating in the program will focus on one of the four Grand Challenge themes, or one of the 14 specific Grand Challenge problems. The UIGCSP was launched as a decade-long initiative aiming to graduate over 150 Vandal "Grand Challenge Engineers" equipped with the unique combination of skills, motivation, and leadership to address the Engineering Grand Challenges of the 21st century.

Under Dr. Behnaz Rezaie's supervision, three brilliant sophomore students—**Aaron Burton, Brady Hislop, and Miyako Nakayama**—put together three proposals in less than a week, and participated in Grand Challenge Pitch during the Academy of Engineering ceremony in December. Miyako Nakayama won an award of \$1600; however, based on their detailed preparation for the pitch event, they are all winners.



Miyako Nakayama, Steve Beyerlein, Behnaz Rezaie, Aaron Burton, Brady Hislop

Frank Wesley Childs IV Memorial Scholarship recipients Keirra Ryan and Nicholas Sentieri

The Frank Wesley Childs IV Memorial Scholarship, established in December 1984, honors Frank Childs, a Mechanical Engineering graduate of the University of Idaho, class of 1984. This scholarship is open to University of Idaho students majoring in Mechanical Engineering who have junior or senior standing in the ME program and who have achieved a minimum UI grade point average of 3.0. Applicants must write a brief statement explaining why they chose to study engineering and what beneficial service they might perform through the field of engineering. In their own words, here are this year's winners of the Childs Scholarship.



Kierra Ryan

My name is Kierra Ryan. I am a junior in Mechanical Engineering at the university, and I am originally from Clarkston, WA. I chose to go into mechanical engineering because I enjoy the hands-on aspect. Growing up I always wanted to know how things worked and

would take them apart to figure it out. I have always enjoyed math and science and after job shadowing my senior year, I knew it was for me.

I love this area and all of the nature that is incredible close by. I appreciate how close everything is in Moscow and enjoy walking almost everywhere. I chose the University of Idaho not only for its well-known engineering program but also because I was excited to be a part of the honors program. I

love the small classes offered within my major. The Mechanical Engineering Department does a fantastic job; they have managed to find a large group of faculty members who genuinely care about their students.

I currently enjoy tutoring for the engineering department and enjoy getting to help my peers. I am excited to be interning in the area this summer. I am still contemplating graduate school but want to go into the robotics field after I graduate.

I am ecstatic to be receiving the Childs Scholarship! It is helping me immensely as I am paying for school. I appreciate the honor of receiving this award and want to thank the family for making it possible.



Nicholas Sentieri

My name is Nicholas Sentieri. I am 21 years old and a junior in the mechanical engineering program. I was born and raised in Idaho Falls, Idaho, in a small family of four including my loving parents and younger sister, Sydney. I am involved in several clubs on campus including the American Society of Mechanical Engineering (ASME), Northwest Organization of Rocket Engineers (NORE), as well as currently serving as a Study

Abroad Ambassador. In the spring of 2016, I was grateful to have the opportunity to study abroad in Torino, Italy, where I was able to connect with family, study the language, and experience the diverse cultures of Italy.

From a young age, I have been fascinated with the way mechanical objects work. I would take these objects apart, find out how they functioned, attempt to fix them, and eventually piece them back together. Additionally, subjects like math and science have come naturally to me over the years, so when choosing a discipline to study at a university, I felt engineering—and more specifically mechanical engineering—would be the best fit. Fortunately, I was correct in this choice. I have grown to love engineering more and more each and every day, with each and every new concept. Someday, in the not so distant future, I hope to work to improve on engineering concepts and techniques to create more efficient mechanical designs and equipment. I aspire to one day contribute a significant finding to the world and to give back in some way. I have been very fortunate in my life with the opportunities I have been given. To return the favor in any way through innovation is why I decided to become an engineer.

I would like to thank the Child's Family for their generous support, as well as engineers past, present and future. I am honored to have received this scholarship and will do my best to uphold the characteristics of a recipient. Thank you very much.



Ahmad Hammad

Ahmad Hammad presented his master's work at the 2016 PacTrans Regional Transportation Conference, October 25-26 held at the University of Washington. The poster by ME graduate student Ahmad Hammad, his advisors Dr. Tao Xing and Dr. Ahmed Abdel-Rahim won third place. Titled "Aerodynamic Effects on Two-Lane Rural Highway Safety," this two-year

research project probes the risks associated with travelling on undivided, two-lane rural highways shared by fast-moving cars and trucks. These rural roads, compared to urban roads in the U.S., see a proportionately higher number of fatalities with respect to traffic volume. Do aerodynamic forces play a role?

To answer this question, this study uses high resolution, three-dimensional computational fluid dynamics (CFD) simulations, and experimental wind tunnel measurements (in the ME subsonic wind tunnel) to investigate the change in forces and moments acting on vehicles during highway crossing or overtaking, especially when there is a large size differential between vehicles. By exploiting the large computational resources available for UI researchers (primarily Big-STEM), numerous CFD simulations were performed under different environmental wind conditions.

The results will help improve existing rural highway policies by revealing safe lateral and trailing distances, and safe relative velocities between vehicles of dissimilar size, and will also identify the need for crosswind mitigation strategies on heavily-traveled sections of rural highways.

In the future, the CFD framework laid out by this study can be expanded to include other types of vehicles (bicycles, motorcycles, and even pedestrians), and to investigate the aerodynamic effects of larger vehicles in the aforementioned scenarios. The ME subsonic wind tunnel remains a valuable tool to validate results of future CFD simulations.

ME 313 Modeling of Dynamic Systems Class Project

(Michael Anderson)

Inexpensive technology is enabling hands-on learning in traditional lecture classes. In ME 313 Modeling of Dynamic Systems, each student creates an experimental project to demonstrate a physical example of a feedback control system. In this project, students assemble components of a control system for an inverted pendulum. The components include an Arduino micro-controller, MEMS accelerometer, H-bridge integrated circuit, battery power supply, toy motor and gearbox, and pendulum hardware. The apparatus is provided to students enrolled in class, and costs ~\$33. Students are asked to code a control algorithm in the Arduino microcontroller that will enable the pendulum to balance upright, in spite of the presence of disturbances. The project takes place in four steps, the last step being a demonstration by each student during a class period in the last week of the semester. The project was initiated during spring semester 2014. ME students have been very successful in completing this project, and the demonstration of 40-55 projects in the duration of one lecture period is quite *exciting*!



Professor Anderson takes notes on the project created by Jacob Riggs and Will Seegmiller.

STUDENT AWARDS AND ACTIVITIES CONT.

Bandbeesten Grand Piano: A Half-Time Delight!

(Coleton Bailey)

It has been an honor to work on the Bandbeesten Project under the guidance of Edwin Odom and Spencer Martin during summer/fall 2016. My team was able to capitalize on the success of many senior design teams before us, and added a new instrument to the Bandbeesten family.

The Bandbeesten is powered using three independent electric motors running off a combined 24V power supply using six lead acid batteries. Utilizing the same principles of lightweight construction as found in airplanes, my team designed and built what would appear to be a living room grand piano from laser-cut Baltic Birch plywood. The piano cantilevers off the two front legs and is operated by an electronic keyboard. The keyboard is powered by the same unit that supplies power to the onboard micro-controller, and the sound is made possible by a wireless transmitter communicating with the stadium sound system. The design resulted in a lightweight structure (only tens of pounds) that appears much heavier than audience members imagine. It's versatility on the field is that of a normal band member. The combination of all the design, construction work, and code refinement put into this project was unveiled in a November Sound of Idaho Marching Band halftime show. The Bandbeesten piano was also invited to the Idaho Famous Potato Bowl at Albertson's Stadium and earned its cold weather certification even though these conditions far exceeded its original design specification.

I am grateful to have had the experience to participate in this project, and hope that the legacy of the Bandbeesten will continue in new and different forms in the future. I'm now a UI graduate student and stand ready to help out the next generation of engineering musicians.



Even Joe Vandal wants to play the Bandbeesten grand piano. His first lesson with Jiovanni-Rey de Pedro!



The Bandbeesten piano, integrated into the Sound of Idaho Marching Band, was a hit at Vandal games, played here by Dr. Jovanni-Rey de Pedro from the School of Music faculty



Parker Matthews explains the "piano" construction to an interested Snapshot attendee in December.

Clean Snowmobile Challenge Team Outreach

Six members of the UI Clean Snowmobile Challenge (CSC) team attended the 36th Annual Idaho State Snowmobile Association (ISSA) convention in Lewiston, October 21-22. Members of the team made presentations to ISSA convention goers, explaining the history of University of Idaho engineering students' participation in the annual Society of Automobile Engineers CSC event in Houghton, Michigan. Team members discussed current projects for this year's competition, in addition to displaying their new sled provided by Skidoo.



CSC team members (left to right) Aaron Eliason, Patrick Paulus, Cade Smith, Zach Lipple, Jeffrey Black and Jason Maas with ISSA Past-President Royal Kingsley on the new Skidoo sled.

Capstone Design/ASME Industry Panel: Expectations of Engineers in Industry

"What will I be expected to do in my first job after graduating?"

This and other questions were answered by our panel of industry experts invited to talk with Senior Design students.

The event, sponsored and promoted by the ASME student chapter, was designed to give students a chance to learn what it is like in industry and how best to manage the transition. Students packed the Borah Theatre to ask questions of the generous and knowledgeable panelists: Caitlin Owsley, Janicki Industries; Kurran Kelly, BP; Jonathan Richards, Schweitzer Engineering Laboratories; and Nadine Morasci, Esterline Interface Technologies.



ME students took full advantage of this opportunity to find out "what it's like" after graduation.

Electric and Magnetic Field Survey Measurements using AUVs

In August 2016, UI researchers travelled to the South Florida Ocean Measurement Center (SFOMC) near Ft. Lauderdale to perform electric and magnetic field survey measurements. Autonomous Underwater Vehicles (small submarines) equipped with sensors were used to perform the measurements. The UI team included John Canning (Research Engineer), Richard Oare (Research Engineer), Samuel Qualls and Ronnie Ross (ME graduate students), working with Michael Anderson.

Preliminary analyses show that the experiments were successful, and the results will appear shortly in the technical literature. A new three-year UI research segment funded by the Office of Naval Research has been initiated, so we expect to return to SFOMC or another naval facility again soon.



Sam Qualls and Ronnie Ross taking measurements.

FACULTY/STAFF

John Crepeau serves ABET, Fulbright Scholar Program

John Crepeau has been recognized and lauded for his "significant contribution...to our organization and to technical education worldwide."

In a letter to Dean Stauffer, Michael Milligan, Executive Director and CEO of the ABET organization explained the value of the program this way:

"With ABET accreditation, students, employers, and the society we serve can be confident that a program meets the quality standards that produce graduates prepared to enter a global workforce. Thanks to the commitment of ABET Experts like John, more than 100,000 graduates each year benefit from ABET's mission of promoting quality and innovation in technical education."

"In his role as a program evaluator, John assists ABET in reviewing more than 3,500 programs at over 700 institutions in 29 countries worldwide. Our program evaluators thoroughly examine and evaluate programs against accreditation criteria—reviewing course materials and student transcripts; interviewing faculty, staff, and students; and examining academic facilities, such as laboratories and libraries. Our ABET Experts—program evaluators and team chairs—are truly at the "front line" of the work we do, ensuring a quality educational experience for so many students."

In a letter to Steve Beyerlein, Jordanna Enrich, Director, Fulbright U.S. Scholar Program, wrote:

"I am writing to send our deep appreciation for the service of Dr. John Crepeau from your institution. Dr. Crepeau served on the Andean Peer Review Committee, which completed the merit review of Fulbright U.S. Scholar Program applications for 2017-2018."

"CIES (Council for International Exchange of Scholars) appreciates the time Dr. Crepeau contributed to reading and evaluating applications. We send this acknowledgment of our gratitude for the expertise provided by this academic service, which furthers the Fulbright goals of increasing mutual understanding through international academic exchange."



When John is not teaching dynamics, advising students, serving ABET or other causes, he might be found admiring one of the several orchids he successfully cultivates in his office.

FACULTY/STAFF CONT.

Steven W. Beyerlein, 2017 Recipient of the Ben C. Sparks Medal

The Ben C. Sparks Medal was established in 1990 for recognition of eminent service to mechanical engineering or engineering technology education through outstanding contributions that bring innovative, authentic, practice-based, engineering design/build experiences to undergraduate students. The award is bestowed for excellence in curriculum implementation, teaching, academic/industry collaboration, or exemplary service to ASME student design-related programs.

Candidates must have a record of accomplishment over an extended period of time; play a major role in fostering new, innovative applications and approaches to the teaching of mechanical engineering and/or engineering technology; or effectively inspire promising systemic change that would enhance the readiness of graduates to begin engineering practice in industry. The medal was established in memory of Ben C. Sparks, a devoted member of ASME and a dedicated teacher of mechanical engineering technology and mechanical engineering.



A faculty member since 1987, Dr. Beyerlein is currently Professor and Chairman of the University of Idaho Mechanical Engineering Department. He teaches courses in design, solid modeling, lean manufacturing, thermodynamics, and combustion engine systems, and is involved in research related to engine testing, combustion modeling, industrial energy conservation, design pedagogy, and educational assessment. Since 1996, Dr. Beyerlein has served as coordinator of an interdisciplinary capstone design program that annually involves up to eight faculty, a half-dozen graduate student mentors, two technical staff, and more than 140 seniors from biological engineering, mechanical engineering, electrical engineering, and computer science. Design teams work with a faculty advisor as well as an external client on a different product realization project supported by regional industry or an on-campus research group. Each April, teams show their prototypes to the public in the UI Design Expo, the longest running academic design show in the Pacific Northwest. Dr. Beyerlein has played an active role in Design Expo planning and implementation over nearly all of its 24 year history.

ME Shop—We are happy to have Bill!

Bill Magnie has the shop up and running.

I have always been interested in motorcycles and cars. When I was a teen I was reading a HOT ROD magazine and came across some photos of an Offenhauser racing engine that was a piece of art. I decided then that I wanted to build racing engines.

I joined the Navy out of high school, trained to become a machinist, and have worked in the trade for 40 years running all sorts of machines

in many different industries. I still have not built that racing engine but maybe some future UI project will satisfy that desire.

I am excited about the opportunity to work with students and faculty on their innovative ideas and projects. That and the beautiful Palouse region are a good part of what brought my wife and me to Idaho from northern California. We have a great machine shop and I hope to expand on our capabilities in the future with equipment upgrades utilizing emerging technologies.



Bill with the Haas Tool Room Mill in the ME shop.

ADVISORY BOARD: MEMBER SPOTLIGHT AND FALL REPORT



Jonathan Richards

Jonathan Richards is a Mechanical Engineering Manager at Schweitzer Engineering Laboratories with over 10 years of professional experience.

Jonathan graduated from

the University of Idaho with his BSME degree in 2004 and MSME degree in 2006. His graduate lead professor was Dr. Michael Anderson with whom he researched acoustics and vibration. Jonathan initially went to work in the aerospace industry at Orbital Sciences Launch Systems Group (now Orbital ATK) in Chandler, Arizona where he spent 5 years supporting design, integration, and testing of electronic hardware for launch vehicles associated with research satellite deployment, military targets, and national defense. Jonathan returned to the Palouse to apply his past experiences to the power industry in the Research and Design Department at Schweitzer Engineering Laboratories, where he has remained for the last 5 years designing a wide variety of rugged industrial-grade equipment. Jonathan was invited to join the Mechanical Engineering Department Advisory Board last year. He enjoys teaching and mentoring young engineers and regularly visits the University of Idaho to interact with students during senior design snapshot days, career fairs, and the annual Engineering Expo.



Dave Park

Dave Park is an Associate Mechanical Engineer at Schweitzer Engineering Laboratories. Dave graduated from the University of Idaho with his BSME degree in May of 2016.

During his time at the University, he worked as an undergraduate research assistant on the Autonomous Underwater Vehicle project for NAVSEA, then as a Mechanical Engineering Intern for Schweitzer Engineering Laboratories. Upon graduating, Dave was offered a full-time position as an Associate Mechanical Engineer where he has continued to develop his skills in a variety of areas while designing mechanical solutions for a variety of areas while designing mechanical solutions for a variety of SEL products. Dave was invited to join the Mechanical Engineering Department Advisory Board last year, and looks forward to contributing his efforts and ideas to the department that enabled him to become an engineer and develop his career so far.

Fall Advisory Board Report



Todd Swanstrom

Under the guidance of Todd Swanstrom, incoming Advisory Board Chair, the ME department hosted a Fall Advisory Board meeting on October 3rd. At last year's spring meeting associated with Design Expo, we discovered that several members would be on campus for the Fall Career Fair, so it was decided to capitalize on this by holding an evening meeting focused on face-to-face interaction with students along with laboratory visitation. Goals of the meeting included: acquainting members with scholarship recipients, ASME/SAE club leaders, and graduate students, as

well as two new technical staff (Ankit Gupta and Bill Magnie); developing shared understanding of the status of current laboratory spaces; brainstorming ways that the Advisory Board could collaborate in renewing design/laboratory infrastructure; and receiving Advisory Board feedback on next-generation Program Educational Objectives for ABET (see letter from the chair at the end of the newsletter). Eight advisory board members attended along with nine faculty/staff and eleven students.

The meeting began with informal discussions of second semester capstone projects, a buffet Italian dinner in the design suite meeting area, and round robin introductions by Advisory Board members, faculty/staff, and students. The major thrust of the meeting was a walking tour of ME laboratory and fabrication infrastructure, building on themes shared in two previous newsletters—"Our Vision for Hands-On Engineering Education," Spring 2016, and "Our Distinctive Learning Environment," Fall 2016.

Meeting participants toured a half-dozen ME laboratory spaces where lab leads demonstrated ongoing instructional and research uses, recent upgrades to equipment as well as facilities, and improvements and ideas for future laboratory enhancement. Lively discussion ensued. Board members ratified the following departmental goals for fortifying our distinctive hands-on learning environment.

- Leverage UI branding as the design/manufacturing program of distinction in the region.
- Acquire at least one new major piece of shop/lab equipment every year.
- Renovate at least one educational lab area every year.
- Work toward sustainable funding (materials & travel) for competition projects.
- Establish an endowed ME Chair for Design, which would provide funding for graduate students involved in capstone mentoring, and materials for special design/manufacturing stewardship projects.

MECHANICAL ENGINEERING NEWS

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Any opinions expressed herein are those of the writers and do not necessarily represent the official position(s) of the university or its Board of Regents.

Editor: Elaine Queener

HEARD FROM ALUMNI

Matt Guthrie

BSME S2014, Mechanical Engineer/Designer, MTM Robotics

Currently I work for a company called MTM Robotics (aka Mobile Tool Management...this is the old name which isn't quite as flashy :D). My role involves designing robots which help automate the aerospace industry. I work with companies such as Airbus, The Boeing Company, and Lockheed Martin.

The robots I design suction down on the skin of the aircraft, travel around the fuselage, and drill the holes that hold the rivets for attaching the skin to the frame. I thoroughly enjoy my job, and continue to learn valuable engineering skills every day. Here is a website link:

<http://mobiletoolmanagement.com/>

I am extremely proud of my UI degree, and I am completely grateful to the faculty and staff in the ME department. Going into this field was exciting and a little unnerving, but I have always felt well equipped because of my education. Please send my best to all of the staff, especially Dr. Beyerlein who has always been a great mentor to me, and he is a fantastic professor.

Chris Jerue

BSME S2015, Nuclear Engineer, Puget Sound Naval Shipyard

Life after college is going well. I have gone through a lot of rigorous on-the-job schooling to learn the Nuclear Engineering aspects of my job. There has also been a lot of on-the-job training to gain the needed knowledge to do my job, as well as the ins and outs of Submarines and Aircraft Carriers. I lived in Japan for 5 months last year working on our forward deployed Aircraft Carrier for its maintenance and repair availability. Afterwards, I participated in sea trials where I lived and worked on the Aircraft Carrier out in the ocean for a week at the end of the project to test these upgrades. That was a lot of fun and a great experience.

Richard Statler

BSME S2004, Engineering Manager, Eaton Corp

Thank you for following up and passing on the link to the newsletter. I was able to complete the surveys today. My wife and I are always impressed with the interactions we have with the UI and consider ourselves lucky for the chance to have gone there. One of my team members is an alum from the 70's and he is equally impressed with the quality the school has. Reading the newsletter I can see the department continues to make great strides to renew and offer high quality education.

I look forward to touching base in the spring to line up an opportunity to work together on a capstone project. Attached is a summary of my team and our products. We are always making fixtures and test equipment to support new product development, so there may be a project there. Keep up the great work. Go Vandals!

Jessica Aldecoa Hines

BSME S2012, Mechanical Engineer, Pensar Development, Inc.

Great to hear from you, hope all is well! Things are great here. Kirkwood Hines and I got married this summer and are living and working in Seattle. Kirkwood works for SquareOne, a company that designs and manufactures wakeboards and water skis. I work for Pensar Development, an engineering consulting and product development firm focusing on consumer electronics and medical devices. We both spend a good chunk of time in SolidWorks and often look back and laugh at how tricky those CAD projects seemed in your class.

Jim Stoor

BSME 1998, Boise Site Test Engineering and Equipment Manager, Micron

I can tell you that my education from UI has treated me very well. I found that it had me well prepared for the professional world and things have gone great for me in that sense. I worked as a food-packaging consultant from 1998 to 2006 and then joined Micron Technology in 2006, where I'm currently employed. Micron has been really good to me and has provided excellent opportunities; overall has been a great experience. I have held roles in design engineering, safety, process engineering, quality, materials, and have been in supervisory and management roles for the last 3 years. I'm currently the Boise Site Test Engineering and Equipment Manager, where I have the honor to work with a group of about 70 team members who are all keeping approximately 500 pieces of equipment modern and running. It is a very challenging and rewarding role for me. I do spend most of my time with the management hat on, but make a concerted effort to kick up the engineering dust, if you will, from time to time and work on or contribute to a design project. Thus far, my education has provided for a fulfilling and rewarding career without any issues maintaining gainful employment.

It would be good to get back up to Moscow and see the facilities. I'm sure a lot has changed since 1998.

Matthew Walker

BSME S2001, MSME Su2003, Head, Missile Performance Office, Naval Air Warfare Center Weapons Division

I made a return to NAVAIR in 2008 after working at ATK Thiokol for 3 years, and the decision was a great one. My career has kind of taken off over recent years. I am now leading a team of engineers building ramjets, and I am having a blast. In fact, just last week we had a flight test of a solid fuel ramjet that was extremely successful. No doubt, I have been very blessed, and I still feel very fortunate to have been trained up at UI. The education simply was top notch! I can't emphasize that enough.

NAVAIR put together a YouTube video that outlines one of the projects that I have been involved with recently. The video is a bit cheesy, and I am not very happy with my interviewing skills, but I am very happy with what our team produced. View when you have a few minutes to spare (and have a good chuckle).

<https://www.youtube.com/watch?v=an7DBwupJ5A>

ME ALUMNI:

We are always happy to get news from you: change of job? Recognition or award of some kind? New innovations in your industry? News for the newsletter is a good thing. Help us celebrate Vandal Engineering!

LETTER FROM THE CHAIR



Steve Beyerlein

It has been a pleasure receiving and responding to numerous alumni emails associated with the ABET survey in our Fall 2016 Newsletter. These messages conveyed many reflections on the special value of our Vandal Engineering program, as well as interest in staying connected with current students and their educational activities. Sections of this newsletter also contain other examples of alumni contributions—in lab development, space

renovation, and long-standing commitment to industry-based senior design projects. This high level of community engagement is essential for sustaining our quality learning environment and our reputation for excellence in authentic, hands-on engineering education.

Establishing well-founded educational objectives to guide design and delivery of our program is essential for ABET accreditation. It is even more critical for making informed decisions inside and outside the classroom. What follows is a summary of findings from the Program Educational Objective (PEO) survey. Our PEOs consist of five complementary statements of what our graduates should be able to do in the engineering workplace 3-5 years after receiving their degree. These statements are aligned with the five University of Idaho institutional learning outcomes. Nearly 60 respondents who graduated between 1970 and 2015 have already weighed in with their opinions and comments. Their collective wisdom is summarized in the following table and discussion.

PEO #1 aligns with the UI learning outcome **Learn & Integrate**, featuring technical skills required for professional performance. Questions raised by respondents about this PEO: What skill areas are especially important in your career and how do these differ from those that characterize the career paths of your classmates? How do application of codes and standards impact this objective statement? What skills are best emphasized in academia and what skills require maturation in the workplace?

PEO #2 aligns with the UI learning outcome **Create & Innovate**, emphasizing proficiency navigating a client-driven design process that is guided by sound project management. Questions raised by respondents about this PEO: How do creative ideas spring from analysis of client needs? What is the progression of experience through which one gains leadership responsibility in this area? How should schedule, budget, and quality be managed for stakeholder agreement and for optimal outcomes?

PEO #3 aligns with the UI learning outcome **Communicate**, involving verbal, written, and graphical mediums. This was recognized as a key area that reflects on most of the other PEOs. Questions raised by respondents about this PEO: What forms of communication are likely to be most meaningful and impactful in interacting with peers? How is this reflected in exemplary design documentation?

PEO #4 aligns with the UI learning outcome **Purpose & Perspective**, underscoring personal initiative in growing professional capabilities and enriching world-views. Questions raised by respondents about this PEO: What are the sub-disciplines where professional licensure is most important? What are the different ways that employees stay current with emerging technology and software? How do you become a subject matter expert?

PEO #5 aligns with the UI learning outcome **Practice Citizenship**, including fellowship with others in the workplace, interaction with practitioners outside one's organization, and service to others in society. While many employers do not care what their employees do in their free time, many respondents felt that attainment of this objective should be distinctive amongst UI graduates.

Program Educational Objective (3-5 years post-graduation)	Does not Meet Expectations	Meets Expectations	Exceeds Expectations
1) Graduates will have gained career advancement based on knowledge as well as demonstrated skill in several of the following areas: engineering analysis, modeling/simulation, design, manufacturing, and experimental methods.	2%	69%	31%
2) Graduates will have gained client and stakeholder satisfaction with engineering problem solutions obtained through wise use of time, talent, and budgetary resources.	0%	83%	17%
3) Graduates will have gained recognition as accomplished communicators within their field/industry.	2%	72%	26%
4) Graduates will have gained evidence of continued professional development such as professional licensure, pursuit of graduate study, success in obtaining various certifications, or active participation in technical conference/forums.	2%	57%	41%
5) Graduates will have gained expanded responsibilities for coordinating activities as well as collaborating with others within their organizations, professional community, and/or society at large.	2%	69%	31%

If you would like to add your PEO votes and insights based on your professional experience, the survey link below will remain open through the end of June. Survey Monkey data indicates that the typical respondent finished the survey within five minutes.

As you take time out to complete the survey, do invest some extra time to drop us a line about where you are and what you are doing. We would like to join in celebrating your successes and sharing your stories with the next generation of Vandal Engineers. Help us spread the word by asking fellow ME alums if they have read the newsletter and weighed in with their feedback.

<https://www.surveymonkey.com/r/c729CWK>



24TH ANNUAL DESIGN EXPO

Friday, April 28th (8:30-3:30) | Pittman Center (SUB)



Jennifer Downen, Tristan Higgins, Hai Yu, and Husain Altaqui display their finished project at the mid-year Snapshot Day.

Capstone projects with ME students:

- Drain Pan Welding Cell, Colmac Coil
- 3D Metal Printing, Mechanical Engineering Dept
- Flue Gas Energy Recovery, UI Facilities
- Snowmobile Muffler, NIATT
- Flywheel Control, NASA
- Grid Defender, College of Business
- Tendon Stress Apparatus, Biological Engineering Dept
- Automated Burnishing Machine, Nightforce Optics
- Aquatic Weed Removal, UI Arboretum
- Next Generation FHSAE Powertrain, Mechanical Engineering Dept
- Biological Stiffness Measurement, Biological Engineering Dept
- Metrology of Hydropower Equipment, Wagstaff Engineering
- Titanium Fitting Sorting, The Boeing Company
- Grain Storage Tube, Treasure Valley Seed
- Fixture for Silicide Coating, ATI Metals
- Sediment Cleaning of Water Tanks, UI Facilities

KEEP IN TOUCH! We want to hear from you!

MAIL TO: Mechanical Engineering Department, University of Idaho, 875 Perimeter Dr. MS 0902, Moscow, ID 83844
or e-mail: medept@uidaho.edu.

Name _____

E-mail _____

Phone _____

Address _____

City _____ State _____ Zip _____

UI degree & year _____

Employer _____

Position _____

Comments _____

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