

# MECHANICAL ENGINEERING | NEWS

University of Idaho  
College of Engineering

## WE MISS RUSS!



“I will be retiring from the University of Idaho July 31, 2016. (My last working day will be July 29th.) It has been a great run but it is time for younger ideas and enthusiasm to take over. I have enjoyed my time with the department and college immensely.”

After 17 years of running a tight ship—or make that shop—Russ is claiming his time as his own.

Many of you reading this will remember toeing the mark in the ME shop under Russ Porter. Expectations were high—keep it clean and put everything back where it belongs—which gave you the high-level, disciplined experience turning you into a professional engineer. Russ was ready and willing to help whenever asked, but insisted that the rules be followed. Students came to respect his knowledge and skill, enjoy his humor, and appreciate his gentle guidance when things went awry. This is the attitude that has helped make the Mechanical



Russ instructing Theo White and Shawn Trimble



Engineering Department so well-known for hands-on design/manufacturing education.

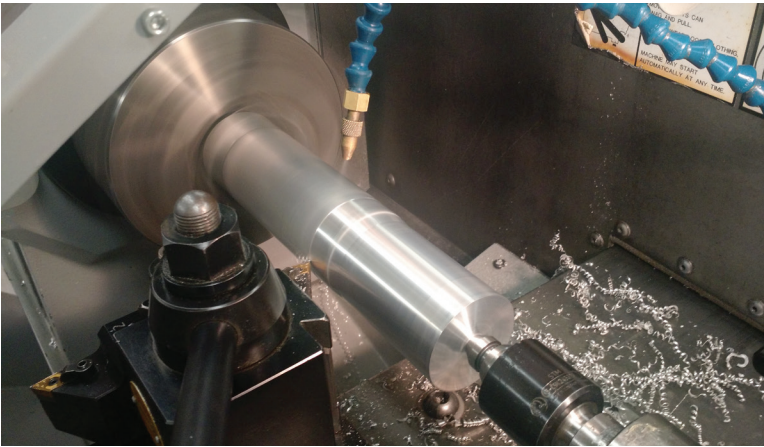
When asked about retirement so far (about 8 weeks in), Russ responded: “As far as my retirement, it’s great! My wife and I have some home remodeling projects we have been working on. Also, keeping up with our large garden has been nice. Instead of heading north for my job five days a week, I now join my wife for a two mile walk to start our day out. Grandkids are here a lot during the summer, so that is enlightening. We don’t have any immediate trips planned for the moment, other than the trips we make to Colorado to see our grandkids there. Retirement is great and I highly recommend it.”



ME faculty, staff and students wish Russ well at June gathering.

Always held in high regard by students, a special good-bye memento seemed in order. The following text and photos were contributed by Jake Gilles, MSME student.

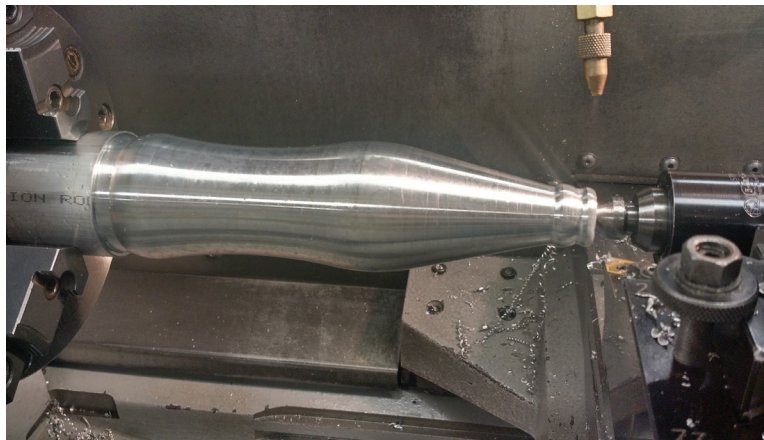
# RUSS PORTER Retirement Project



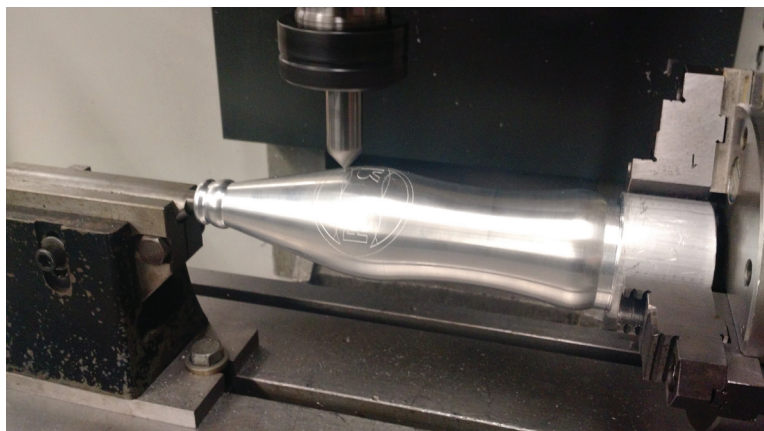
CNC Lathe



CNC Lathe



CNC Lathe



CNC Mill-The curvature of the bottle made engraving a challenge.

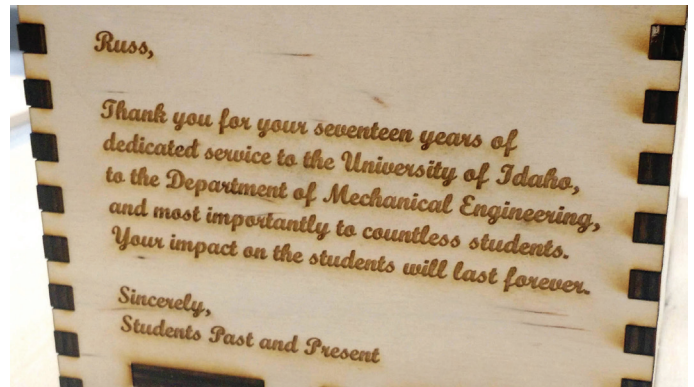
After hearing of Russ' plan to retire, a group of M.E. graduate students decided that he needed a personalized gift to show the appreciation of all the students that he had impacted over the years. Justin Pettingill came up with the idea of making custom aluminum soft drink bottles with Russ's name engraved on them in place of the usual company logo. With this idea hashed out, work started on a set of six matching bottles over a three-week period this summer.

The first step for the bottles was the CNC lathe to get their shape turned out of the 2.5" aluminum stock. This process took about 8 minutes per bottle once the CAM code was proven and optimized for the parts.

After the lathe, the parts moved on to the CNC mill where the 4th axis tool was used in the engraving process. Due to the curvature of the bottles the programming of the CNC mill was very complicated compared to other parts created with the 4th axis tool. It took a day and half to prove out a program



Bottle Cap



Six-pack case made of wood



that yielded satisfactory results. UI Facilities machinist James Mader was instrumental in helping the students debug the code which ended up including several counter-intuitive programming segments.

Once the engraving was finished, the excess stock was cut off using the bandsaw, and the bottom of the bottle was sculpted back on the CNC lathe.

With the aluminum bottles completed, work moved on to a wooden six pack holder and engraved bottle caps. The holder was designed by Jeremiah Schroeder and cut out using the department's new laser cutter.

All-in-all, this project proved to be a memorable learning experience for the engineers involved! It harnessed the type of ingenuity and attention to detail that Russ had cultivated in many generations of Vandal Engineers. Russ was elated to receive the gift and learn about its design/manufacturing.

**UPDATE:** The shop is up and running under the direction of Bill Magnie who started work on September 26th. His selection was the result of a wide-ranging and rigorous search that brought five well-qualified candidates to campus for lively sessions with students/faculty/staff. Look for more information in your next ME newsletter on Bill's background, his dreams for the ME shop, and his fascination with custom cars and motorcycles.

# STUDENTS

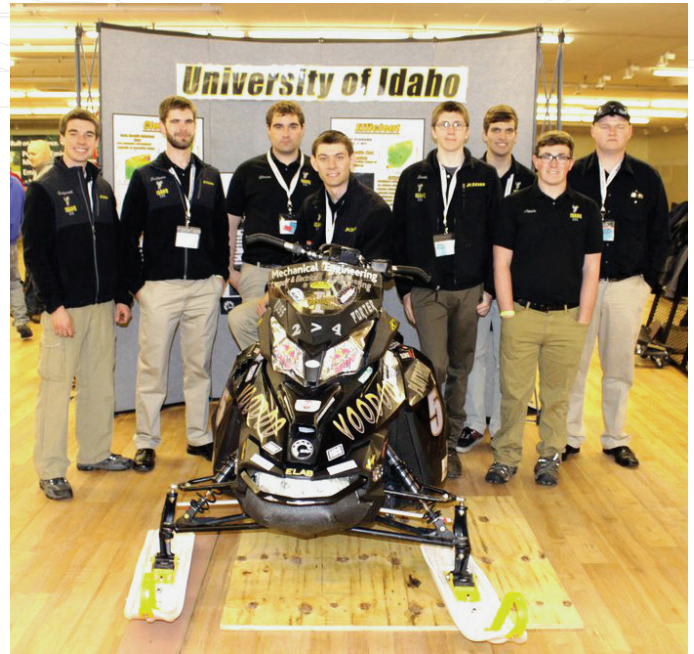
## Spring 2016 Clean Snowmobile Challenge—with minimal snow

Summary of the week from Dillon Savage, ME master's student

I just wanted to give you all a quick update on what we did tonight, in lieu of Dan's normal message because he shouldn't type and drive. Our team performed very well. We had some issues on dyno that didn't allow us to safely finish one event. Because of this we weren't eligible for a top three finish. That being said, we were great stewards for the university. We made a lasting impression on many judges who were very nearly begging Idaho students to work for them.

Moreover we won several monetary awards centered around innovative technologies—a great testament to the countless hours put in on this project. I was proud to see how much the students have grown and changed. I literally work with them day and night on this project. I watched a group of many young men and women transform from unsure students to confident engineers. It's amazing to see how they all became experts on our snowmobile, transforming stuttery query speech to smooth confident expertise.

Overall, the competition did not go smoothly for us. The weather was warm and we spent several hours debugging and repairing coolant issues. But the students responded very well, worked hard and solved the problem quickly. The awards taken home by us included: (1) cold start (one pull again!), (2) endurance, (3) best fuel economy, (4) most innovative emissions design, (5) best use of controls (a nice nod to our interdisciplinary work), and (6) most manufacture able solution. Beyond this we achieved a very high score on the presentation and paper, which shows how well our students communicate. We were very competitive in performance events, losing only



CSC team: Adam Sedgwick, Ian Sullivan, Aaron Eliason, Mark Woodland, Cade Smith, Jason Maas, Zach Lipple, Dillon Savage

to a beautifully-designed four-stroke. Another point of pride is that we achieved the 3rd highest score (or lowest emissions) in the in-service emissions event which represents the snowmobile in typical riding situations. This isn't all we achieved.

Our most notable achievement was an award we have won three times before—an award that has never been won back-to-back—until now! That award is sportsmanship—the most difficult to receive at the competition because of the culture of clean snowmobile challenge. It is voted on by all of the teams. Last year we won the award for the third time, making us the most-awarded team with regard to sportsmanship. As we won it again, back-to-back, it just shows the culture of our university. Beyond all of this external recognition, the learning and growth of the students this week has been immense. I recommend chatting with them and observing this transformation. It is impressive.

Looking ahead to the 2017 Clean Snow Competition, the Idaho team will use the brand new 2017 Ski-doo Rev-4 chassis and focus heavily on noise and emissions abatement. The design focus for this is around the muffler and exhaust systems. The team is spending a lot of time trying to improve resources internally to make team changeovers more seamless. As always, we are excited to compete against teams from all over the country and to see what incredible technologies they bring to the competition. Good luck to all of our competitors, and we hope to see our followers at the Northwest snowmobile shows.



Our machine

## Annual Fall ME Welcome Barbecue

We kicked off the 2016-2017 school year with the annual ME barbecue held on a pleasant evening on the lawn just west of our building. As you can see from the photos we had a goodly number of attendees who were well fed and eagerly hoped to win one of the drawing prizes.



## 2016 FHSAE Competition

Twenty ME and ECE students contributed to our 2016 entry which emphasized vehicle refinement, powertrain reliability, and electrical safety. This past May, a subset of 6 mechanical engineers and 4 electrical engineers made the cross-country trip to New Hampshire to attend the 2016 Formula Hybrid SAE (FHSAE) Competition. They showed Vandal Engineering pride and collaborated well as they worked hard in and out of their paddock area despite 40 degree weather and near-continuous downpours throughout the week. Like past competitions, there were struggles with interpretation of competition rules—the most complex rule set in the SAE Collegiate Design Series—managing directives by different inspectors, and obtaining a complete set of inspection stickers required for dynamic event driving. Several battery-management system modules needed to be replaced throughout the competition, a modest amount of low-voltage rewiring was needed, and extensive testing of hybrid system start-up/shut-down protocols was required. Despite repeated visits with electrical judges, these challenges were embraced with a professional mindset and implemented in an elegant manner that elicited compliments from judges as well as members of other teams. Ultimately, the UI team was one of only 8 teams out of the 20+ present to secure a full set of inspection stickers that gave them a green light for full hybrid operation. Their comprehensive design binder and well-conceived electrical system diagrams assembled over the course of the year were vital in achieving this goal. The team was able to do some official driving at the end of the endurance event, ultimately finishing in 6th place.

Our vehicle was again one of the lightest at the competition, one of the best packaged, and one of the most attractive. The team benefitted from many in-kind donations that made this evolving 4-year product possible. We again thank our many donors for your commitment and generosity. The members attending competition were energized by meeting a significant number of UI alumni working in the automotive industry who participated as event judges or coordinators. These individuals were impressed with the 2016 vehicle and they offered students valuable advice on applying for, as well as securing, employment in the transportation industry.

Unlike past years, this year's competition featured a few teams that were able to integrate limited regenerative braking in their systems. This will certainly be a growing trend in future FHSAE events as the endurance event distance keeps growing. Our UI vehicle is not



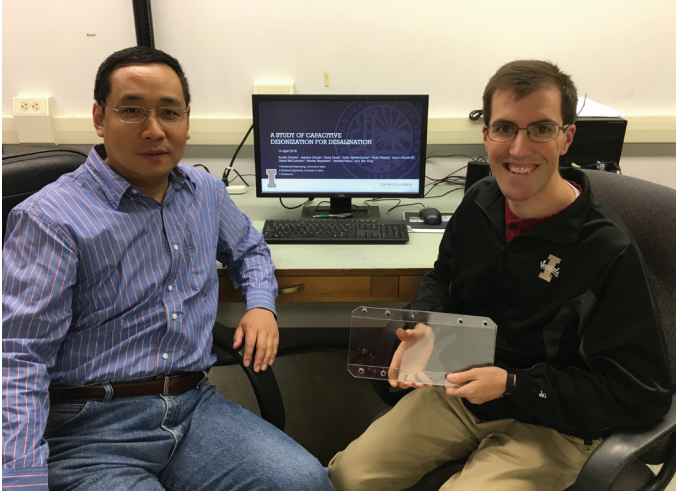
*Team members in New Hampshire braving cold and rain.*



*The entire team back home in the sun!*

configured in a way that front-wheel regen would be practical. As such, this year's appearance will mark the end of the current design cycle that included a first-place finish in 2014. During the 2016-17 academic year we will be exploring and evaluating a next-generation powertrain configuration that can incorporate regenerative braking as well as superior powertrain performance and even tighter packaging. The outcome of these efforts will be displayed at the 2017 Design Expo and used to chart future FHSAE participation.

## University of Idaho Innovation Showcase



Dr. Tao Xing and Austin Doutre,  
"A Study of Capacitive Deionization for Desalination"

The University of Idaho Innovation Showcase is an annual event giving undergraduate and graduate students an opportunity to display the creative and innovative research at the University. The presenter(s) were to prepare an 18-minute presentation for a panel of judges. The full-day schedule showed 48 participating groups divided into four categories; Creative and Artistic Activity, Graduate Disciplinary Research, Graduate Interdisciplinary Research, and Undergraduate presentations. The top three presenters in each category were awarded \$500, \$300, and \$200 prizes respectively.

The associated senior design team—Jessica Drouin (ME), Essa Essa (EE), Cody Moldenhauer (EE), Ryan Ready (EE), and Kevin Woodruff (ME)—made the presentation along with myself who served as their graduate student mentor. Dr. Tao Xing (ME) and Dr. Herbert Hess (EE) were the lead professors for the team, with significant input from Dr. Frank Cheng (Chemistry) and Dr. David McIlroy (Physics). Our team presentation went well; we gave a summary of the theory, designs, and experimental results the team achieved through the previous year. It was a valuable experience for the undergraduates preparing for the Engineering Expo, and enriched my thesis experience. All the presenters were invited to an evening reception to recognize those receiving awards. Guest speaker and University Provost, John Wiencek spoke about his journey to the U of I and how his appreciation for continuous learning and research has been triggered by significant problems over the years. I look forward to returning in 2017 to present my thesis findings about desalination research. (Thank you MSME student Austin Doutre for this report.)

## CMM Kaizen Project

Thanks to a generous donation from The Boeing Company, the University of Idaho is now in possession of a Brown & Sharpe Coordinate Measuring Machine (CMM). The University acquired this device in late spring 2016, and with few people knowing how to use it, a ME 410 Lean Manufacturing kaizen project was conceived to document operation of the machine as well as its user interface. Junior Zach Lipple took this on as his kaizen project and he designed a calibration block that could be used to test machine accuracy on common feature geometries. This design was then manufactured on a CNC mill and the resulting block is stored next to the CMM as a tool for training users of the



Zachary Lipple machining the block.



Russ had a great influence on my engineering career teaching me manufacturing, design, and most of all patience. It always amazed me how patient Russ was working with students of all skill levels. I have also seen the large difference between engineers with and without hands on manufacturing experience. Russ has done an amazing job giving U of I engineers that extra edge.

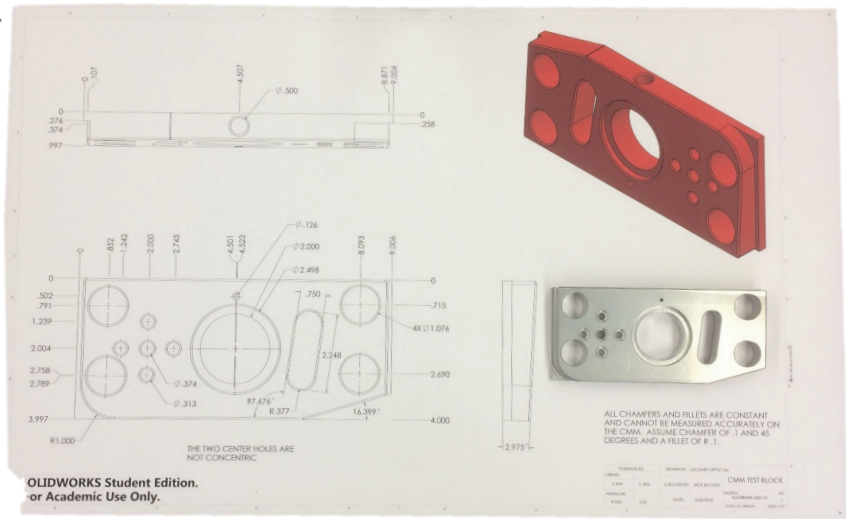
**Nick Harker, BSME 2007, MSME 2009**  
Design Engineering Supervisor, Kenworth Truck Company



TRIBUTE TO RUSS

CMM Kaizen Project continued

Renishaw probe and its connected software. A large, as-built solid model of the calibration block is prominently displayed on the wall behind the CMM for easy reference and comparison. Over the summer, the CMM has been deployed in several senior design projects, including the Clean Snowmobile Competition and Formula Hybrid SAE powertrain teams. The robustness of Zach's calibration block design and implementation has been convincingly demonstrated.



Design and finished block.

## EP 103 Remodel

The Mechanical Engineering Department maintains Engineering Physics (EP) Building room 103 as laboratory space for the Freshman and Sophomore design courses. The room is currently used for multiple purposes; 1) as a teaching laboratory for hands-on lab activities and computer assignments, and 2) as fabrication space for students to construct design projects associated with these two courses. EP 103 had not been upgraded since its construction in 1999. Changes to courses combined with wear necessitated a remodel of this space.

A student team took the charge of re-envisioning the room's layout and design, creating a CAD model of the room to predict flow and workspace requirements. Key proposed changes involve implementing a clean layout, new storage solutions, and other lean thinking principles. Current ME 123 and 223 students were also surveyed to determine other shortcomings of the room. The students identified a

lack of easy-to-access electrical outlets, so drop-down outlets were added to the design.

To date a number of improvements have been completed: a new whiteboard, projector, overhead pull-down power cords, workbench, and tables. The remodel was designed to synergize with other Mechanical Engineering facilities. Over winter break of 2016/2017 additional improvements such as a new floor and rolling chairs are to be added.



A student team created renderings of the room. This view is toward the south wall.



I must be an old-timer because Russ began work at Idaho sometime after I graduated. However, in various capacities, I've had steady contact with him over the years. His skills and knowledge as a machinist are very impressive. But maybe just as important, his instinct for when a student needed help was equally as strong as when they didn't. He made a hugely positive impact and it's easy to see why Russ is so highly regarded and why he will be missed.

Jeff Smutny, BSME 1994, MSME 1998  
Mfg. Engineering Manager  
Wagstaff, Inc. | Spokane, WA

## Annual American Society of Mechanical Engineers Field Trip

(Thanks to Chet McKinnon for this report)

Twelve students and two faculty members (Steve Beyerlein and Michael Maughan) participated in the annual ASME student industry field trip this last spring 2016 in Portland, OR.

The first stop was at Vigor Ironworks, formerly known as United Streetcar. At their Portland campus, Vigor specialized in executing the steelwork behind the production of boats and ships of all sizes. We were shown different pieces of a controllable-pitch propeller used in ice breaker ships as well as different processes behind such production including welding, large-scale CNC machining, and of course, engineering drafting.

The second stop was at Premier Gear in downtown Portland where we were met by Ed Smith, Operations Manager. While there we learned about the different machines used to make gears for all industries. Some were still in operation after one hundred years showing how effective preventive maintenance can be.

The third stop was at Palatov Motorsports where we were able to see the 2015 open-class winner of the Pikes Peak International Hill Climb. Palatov, a company run and operated by five people, did everything from initial concept drawings to final design fabrication. The owner started the company with a group of friends who were in their college formula car team, and took it to a whole new level. They showed how hard work really can pay off if you're driven enough (pun intended).

The fourth stop was at the Evergreen Air and Space Museum in McMinnville, Oregon, which housed the world's largest plane ever constructed—the Hughes H-4 Hercules, also known as the "Spruce Goose." Here the students went between two different buildings housing more than 130 individual exhibits. While on the tour, students were able to take part in flight and shuttle simulators and we quickly learned who we don't want landing our return mission from Mars.

The final stop was at Full Sail Brewery in Hood River Oregon where we had a delicious meal at the pub and proceeded to be shown around their bottling facility. Greeted with free samples and chocolate covered hops, everyone felt right at home while

being shown around the plant. It's one thing to enjoy a cold beer, but seeing how it's produced and the science behind it really gives you a sense of respect for what the microbrew industry has become in the last 25 years.

In summary, the ASME Industry Tour was another memorable adventure. Each year these trips are held, and each year the tour guides give valuable information to the students, letting them know what qualities are desired in new employees and what you can expect on the job.

Apart from the tours, students explore a large city together, making new friends and having unique experiences—this year's was finding out about Voodoo Donut's "bucket of day old donuts" and the sugar crash after attempting to reach the bottom.

We look forward to next year's tours in the Puget Sound area. If you work for a company in the northwest that would be eye-opening and educational for ME students, please let us know so we can include you in our schedule.



Enjoying Multnomah Falls



Cockpit of the Spruce Goose



Working with Russ was inspirational. He was always very patient with the students, sharing knowledge and replacing broken bits over and over. He brought so much skill and knowledge into the machine shop. He made machining difficult pieces look easy. Working with him helped me to realize the extreme value of skilled craftsmen. Their knowledge is truly invaluable.

Caitlin Owsley, BSME 2012  
Project Manager, Janicki Industries



TRIBUTE TO RUSS



## FACULTY/STAFF



**Ankit Gupta**, originally from India, received his BE degree from Visvesvaraya Technological University in Bio-Medical Instrumentation, and his M.S in EECS from Tufts University (Medford, Massachusetts). Prior to joining University of Idaho, he worked as Research and Development Engineer at Dartmouth Medical School (Hanover, New Hampshire) and has also worked as Software/Quality Engineer at Mathworks. At University of Idaho

he is our Principal Research Specialist, involved in maintaining instructional labs, collaborating on research projects, training students in data acquisition/controls, and managing department-wide IT services. We welcome him and appreciate his many skills!



*Dr. Perry and Dr. Wolbrecht go to Disney World...Hotel!*

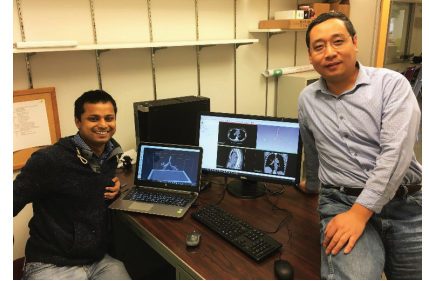
### **Dr. Joel Perry and Dr. Eric Wolbrecht**

attended the IEEE Engineering in Medicine and Biology Society Conference (EMBC) in Orlando, FL. They presented four papers about their rehabilitation robotics and assistive devices research at the conference,

two with oral presentations and two during the poster sessions. The conference also provided valuable opportunities to meet with vendors of research equipment and to create and develop relationships and collaborations with researchers in related fields.

**The FINGER robot**, developed here at UI under the guidance of **Dr. Eric Wolbrecht**, is part of the article in IEEE TNSRE titled "Movement Anticipation and EEG: Implications for BCI-Contingent Robot Therapy." To find the article, click on this link and enter Wolbrecht in the "search" box. <http://tnsre.embs.org/2016/08/05/movement-anticipation-and-eeeg-implications-forbci-contingent-robot-therapy/>

**Dr. Tao Xing** has been granted tenure and promoted to Associate Professor in Mechanical Engineering. Dr. Xing has been an asset to the department in securing grants as well as working with students. A grant has enabled him to bring **Dr. Rabijit Dutta** to campus as a post-doctoral fellow.



*Dr. Rabijit Dutta with Dr.Xing*

### **Rabijit Dutta**

received his PhD from Indian Institute of Technology, Delhi, focusing on modeling turbulent jet impingement heat transfer using high resolution computational fluid dynamic simulations. Prior to joining the University of Idaho, he worked as a Postdoctoral Fellow in the area of CFD simulation of rough-wall turbulent boundary layers at Queens University, Kingston, Canada. He is working with Dr. Tao Xing and Dr. Gordon Murdoch (Animal and Veterinary Science) to develop a multi-scale computational model for simulating a ventilator-assisted human lung. The computational lung simulator is expected to provide patient-specific optimal treatment for airway diseases, e.g., asthma, chronic obstructive pulmonary disease etc. An experimental facility has been developed to measure flow, gas concentration and pressure fields inside post-mortem pig lungs attached with a high frequency ventilator, for verification and validation of the computational model.



It's difficult to quantify the impact that Russ Porter had on my academic and professional career. I didn't even know what a lathe was before I stepped into the machine shop! Thanks to Russ's guidance, patience and encouragement, I was able to go from novice to mentoring other students in a matter of months. Those skills he taught me over my year and a half in the shop gave me the technical experience and confidence that I carried into my career in industry. When I told Russ that I accepted a job at Boeing, he gave me great advice from his own time at the company, which made my transition from college to "the real world" a little less daunting. Congrats on your retirement, Russ! Thank you for all that you did for me during my time at UI.

**Brittany Ballard, BSME 2009, MSME '2011**  
Lead Equipment Engineer, Composite Manufacturing Center at Boeing



TRIBUTE TO RUSS



Russ was always easily approachable and available, making the shop an exciting place to work and learn. I remember when we ruined a 9/16" drill bit by hardening it. He laughed at our team and couldn't figure out how we managed to do that as he had never seen anything like that before. Working with him in learning how to operate the machines and practically manufacture designs has been invaluable during my career. His incredible patience and passion for teaching helped shape me into a better engineer. Best wishes for a relaxing retirement!

**Nadine Morasci, BSME 2014**  
Supply Chain Analyst-Buyer  
Esterline Input Technologies

TRIBUTE TO RUSS

# COLLEGE OF ENGINEERING AWARDS

## Outstanding Mechanical Engineering Graduating Seniors



### Chet McKinnon

Chet McKinnon transferred from Spokane Falls Community College and found his home in the University of Idaho's Mechanical Engineering Department. Chet has mentored for mechanical design analysis, acted as Lead Mechanical Engineer for his capstone design project with NAVSEA and Robosub club of the Palouse in building an autonomous submarine, been a part of the Formula Hybrid SAE Team, and served as President

of the American Society of Mechanical Engineers. Upon graduating in May with his BSME Chet was lucky enough to spend time in Europe returning to the Portland area to find his dream job.



### Jacquelin Remaley

Jacquelin Remaley was born in Idaho Falls, but grew up in Pullman. While at U of I, she participated in many organizations and activities such as ASME MicroBaja, Idaho RISE, and Engineering Scholars to broaden her experience. She taught three semesters of a 3D computer drafting course. Thanks to these experiences, Jacquelin realized she has a passion for the field of Robotics. Last summer, she interned at U of I working on

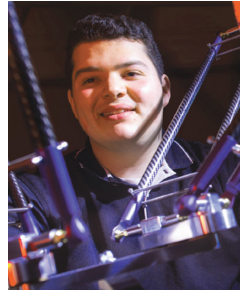
autonomous robotic submarines, and her capstone project relies on integrating mechanical and programming knowledge. Jacquelin has gone on to Oregon State University to pursue a PhD in Robotics.



### Kylie Touchstone

Kylie Touchstone was raised in Boise, and always enjoyed math and science which led her to study engineering at the U of I. The first of her family to attend college, she graduated in May with a BSME and minor in physics. She has greatly enjoyed all that U of I has to offer and is specifically interested in solid mechanics and modeling. Kylie has been a part of Engineering Scholars, Society of Women Engineers, and Tau Beta Pi. Her plan

to work full-time at HP Inc. in Boise as a mechanical hardware engineer has worked out. She reports that her job has been very exciting.



### Stephen Goodwin

Hailing from Coeur d'Alene, Stephen began his undergraduate degree in fall 2010, yet felt upon its completion in spring 2014 that he had "unfinished business" on projects begun during his senior year. To satisfy this feeling, he enrolled as a master's student to continue research in design and development of robotic devices for the

medical field. The specific project pursued with ME faculty is the development of PARTNER, a robot to help stroke patients during physical therapy. In his time at the university he has mentored undergraduate courses, worked with the Vandal Atmospheric Science Team, and competed in the ASME MicroBaja Competition.

#### **Comments from faculty/staff in nominating Stephen for this award:**

*"Stephen has a passion for hands-on learning that is clearly evident in the machine shop, the computer lab, and the experimental lab."*

*"Stephen always holds himself to high standards, embraces authentic engineering challenges, and is widely recognized as a role model for other graduate students in our program."*

*"He...is very effective in engaging young minds in active discussions about the engineering profession as well as the role of a quality learning environment in preparing them for the workplace of tomorrow."*

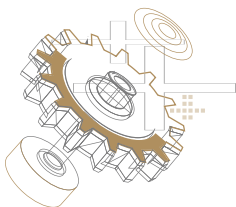
## Outstanding College of Engineering Faculty



### Dr. Ralph Budwig

Ralph Budwig received his B.S.M.E. from the University of Colorado in 1977 and his Ph.D. in fluid mechanics from Johns Hopkins University in 1985. Dr. Budwig came to the University of Idaho as assistant professor in 1985 and worked at the main campus in Moscow for over 20 years, including six years as Chair of the ME department. Since 2007 he has been at the UI

Boise Center and is currently the Director of the Center for Ecohydraulics Stream Laboratory, a \$2M+ facility with multi-university, agency, and company participation.



When I think about my time with Russ there is a lot that comes to mind but I would sum it up to this: I would not be the engineer I am today without Russ's wisdom, patience and teaching ability. From my undergraduate projects to my graduate work and my professional work, none of these would have been possible without him.

Alex Fuhrman, BSME 2011, MSME 2013  
Calibration/Development Engineer - Two-Stroke Engines  
Arctic Cat Inc

His areas of specialization include: experimental and theoretical fluid dynamics; turbulence; optical, acoustic, and thermal measurements techniques; and experimental methods. He enjoys doing project work with graduate students and has been major professor to more than 40 students.

Dr. Budwig is a registered Professional Engineer, a member of the International Association for Hydraulic Research, the American Society of Mechanical Engineers, and the American Physical Society (Fluid Dynamics Division). He leads the Professional Engineering Exam Review course which is a 12-session professional development course conducted at UI Boise once a year.

Dr. Budwig has authored and co-authored numerous research publications in various engineering and fluid dynamics journals and has been the PI and co-PI of projects sponsored by agencies including NASA, the American Heart Association, the National Science Foundation, the National Institutes of Health, and Idaho Power.

## Outstanding Young College of Engineering Faculty



**Dr. Joel Perry**

Joel Perry comes to us from Spain, but only because he spent six years there as senior researcher and project manager at Tecnalia, the largest technology research center in that country. Since joining the UI faculty as an assistant professor in 2014 he has become part of a growing number of faculty with multi-disciplinary interests in robotics, biomechanics, and neurorehabilitation.

Dr. Perry received his Bachelor's, Master's, and PhD degrees all in Mechanical Engineering; his Bachelor's from Gonzaga University in 2000, followed by Master's and Ph.D. from the University of Washington in 2002 and 2006. During graduate and post-graduate research, he was involved in the development of various robotics research prototypes for medical and therapeutic applications. He sharpened his focus further at Tecnalia where he became project manager for all projects on rehabilitation of the upper limb. His work at Tecnalia was acknowledged by the Spanish equivalent of the Economist (Actualidad Económica) with an award for Top Best 100 Ideas of the Year, and achieved recognition as a top five finalist for the EARTO Innovation Prize.

Since joining the University of Idaho, Dr. Perry was awarded a prestigious five-year grant from the NSF to develop a novel instrument for assessment of neuromuscular impairment, a UI Seed Grant toward the purchase of a laser cutter, and support for several student design projects from industry. Dr. Perry's current areas

of interest are focused on the development of exoskeletons and wearable robotics for neurorehabilitation, assistive technologies for disability, telerehabilitation, and rural patient care.

## Outstanding COE Staff



**Elaine Queener**

Elaine's degree from the U of I in elementary education is put to work every day educating college students how to be students! It is a satisfying job to solve problems for students and professors alike, making their time at the University run smoothly and successfully. When not working on campus she may be teaching kids to enjoy music through piano playing, cooking good food for

her husband, knitting a sweater, visiting her children/grandchildren in Iowa, California, or Portugal, or hiking up a mountain with her husband in search of wild flowers, butterflies, or interesting bugs to photograph.

## University of Idaho Outstanding Staff Award



**Molly Steiner**

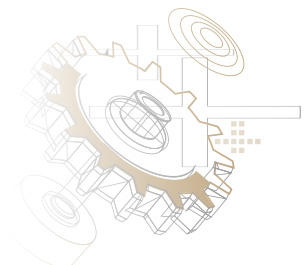
Molly Steiner was chosen as a 2016 UI Outstanding Staff Member in the Technical/Paraprofessional Category. This is an external recognition of her many contributions within the ME Department and across the College of Engineering since 2004. During her tenure as Office Manager for ME, she has organized and energized a responsive as well as efficient office staff and also been a valuable asset

in helping multiple department and committee chairs learn/grow in their administrative responsibilities. Molly has high standards for her work, but also possesses a great sense of humor that helps make the Mechanical Engineering office a welcoming place to students, faculty, staff, and visitors alike. She is a go-to resource on nearly all processes outlined in the Administrative Procedures Manual. Each of us has benefitted from Molly's expertise, her interest in helping us address administrative questions and problems, and her advocacy for change in internal systems which allow us to pursue higher levels of excellence in our teaching, research, and outreach activities. What would we do without her?



Russ is an amazing person. Patient, calm, extremely knowledgeable, humble, funny, and one of the best instructors that I have ever had the pleasure of working with. When I am designing a part or discussing how to machine something I ask myself what would Russ do. His presence and knowledge will be missed when educating new students. Have a great retirement Russ, you have earned every ounce of it.

Scott Anderson, BSME 2003, MSME 2005 Engineer, Bay Shore Systems, Inc.



TRIBUTE TO RUSS

## ALUMNI NOTE

March 9, 2016, From Hieu Truong, BSME May 2011

*Yesterday I successfully defended my PhD thesis and will graduate in May [from The Dwight Look College of Engineering at Texas A & M University].*

*I am starting my new job at the Dow Chemical Company in Freeport, Texas, in less than 3 weeks. Everyone in the group I am joining is really nice to me. They have been patiently waiting for me to complete my degree requirements for about a year and a half now. It is going to be an exciting experience and I look forward to that.*

*I miss all of you in ME and think about you often.*

*Best regards,*

*Hieu*

## ADVISORY BOARD MEMBER SPOTLIGHT

Myles E. Brown

**Engineering Manager – Thermal/ Computational Fluid Dynamics Analysis, Ice/Rain Protection Systems for The Boeing Company**

Myles Brown graduated from the University of Idaho with a Mechanical Engineering degree in 2003. He started his engineering career at Puget Sound Naval Shipyard in Bremerton, WA as a coop student in 2000 transitioning to work as a nuclear test engineer on the USS Abraham Lincoln after graduation.

After a short-lived adventure at a startup company in Redmond, WA, he joined The Boeing Company in 2004. He worked as a thermal/fluids analysis engineer for five years on all Boeing Commercial Airplane (BCA) models in production including development and certification of the 777 freighter which involved resolution of many challenging issues encountered during the flight test program. During that time he became a Designated Engineering Representative (DER) with authority to approve designs on behalf of the FAA. In 2010 he joined the 787 Airplane Level Integration Team where he helped meet a surge of thermal analysis demand as the 787-8 worked its way through the flight test program up to delivery. In early 2011 Myles served as an airplane systems lead engineer on the KC-46A US Air Force Tanker program. Myles transitioned to an engineering management role in 2014 where he oversees several diverse teams of engineers that support all BCA airplane models in production and development.

Myles has served as a judge at the University of Idaho Engineering Expo all but two years since graduating and enjoys mentoring student and early-career engineers.

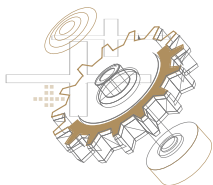
Kurran Kelly

**BP L&I Facility Engineer**

Kurran graduated from the University of Idaho in 2013 with his B.S. in Mechanical Engineering. He has spent the past three years working as an engineer in various roles for BP Exploration Alaska in the Prudhoe Bay oilfield on the North Slope of Alaska. He has held roles as a Reliability Engineer for the field and as a Facility Engineer at one of the oil and gas production facilities. His most recent role is working as a Facility Engineer for the field wide support functions. He is currently preparing for his Professional Engineering accreditation and is a member of the BP college recruitment group. Kurran has served on the Mechanical Engineering advisory board since 2015. Outside of work, he enjoys hunting, fishing, hiking, camping, mountain and road biking, spending time with his friends and family, and various other outdoor activities.



*Kurran Kelly accepts a plaque of appreciation from Dean Stauffer on behalf of British Petroleum (BP) for their sponsorship of EXPO XXIII.*



One of the things I appreciated about Russ was his patience in dealing with students. He would always stop what he was doing to answer our questions or help us set up a machine. One of his sayings I heard numerous times was "We can machine 16 penny nails too, but it's cheaper to buy them"

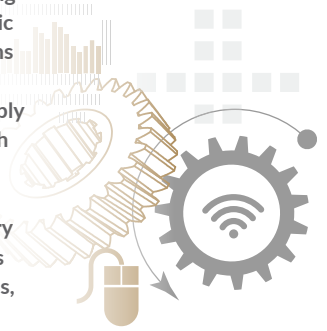
Dylan Dixon, BSME 2010, MSME 2012  
Vista Outdoor @ CCI Speer in Lewiston

TRIBUTE TO RUSS



Wow, I can't believe Russ is retiring—it's hard to picture U of I without him. I have countless memories from my time as a senior and an IEW mentor working in the machine shop under the insightful, engaging, thoughtful, and empathetic tutelage of Russ Porter. I can honestly say that he is one of the primary reasons I continued my education at U of I and focused on machine design. Obviously Russ is an extremely accomplished machinist, but relegating him to being simply a "shop steward" misses his significant contribution to my learning and growth experiences. While I learned a lot from him about shop safety and machining techniques, what I will always carry with me is the way he interacted with, inspired, and taught others. I volunteer with Big Brothers Big Sisters, and every interaction I have with my Little is guided by the questions, "What would Russ do?" "How would he handle this situation?" and, "How would Russ inspire and communicate with warmth, interest and caring?" Thank you, Russ, for all that you gave me and for continuing to be an inspiration for how I want to live my life.

Levi Westra, BSME 2000, MSME 2008  
Avista Utilities



## CELEBRATE OUR CAPSTONE DESIGN JOURNEY!

### Mid-Year Snapshot Day

Friday, Dec 2nd (8:30-12:30),  
Gauss Johnson room 108

### 24th Annual Design Expo

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

#### Ongoing capstone projects with ME students:

Drain Pan Welding Cell, Colmac Coil  
3D Metal Printing, ME Dept  
Flue Gas Energy Recovery, UI Facilities  
Snowmobile Muffler, NIATT  
Flywheel Control, NASA  
Grid Defender, College of Business  
Tendon Stress Apparatus, BE Dept  
Automated Burnishing Machine,  
Nightforce Optics  
Aquatic Weed Removal, UI Arboretum

Next Generation FHSAE  
Powertrain, College of Engineering  
Biological Stiffness Measurement,  
BE Dept  
Metrology of Hydropower  
Equipment, Wagstaff Engineering  
Titanium Fitting Sorting, Boeing  
Company  
Grain Storage Tube, Treasure Valley  
Seed  
Fixture for Silicide Spraying, ATI  
Metals  
Sediment Cleaning of Water Tanks,  
UI Facilities  
Waste Heat Management, ECE  
Dept  
\*Bandbeesten Piano, Vandal  
Marching Band  
\*Trunk Bending Apparatus,  
Psychology Department  
\*Robotic Manufacturing Cell,  
Boeing Company  
\*North Campus Chiller Plant  
Instrumentation, UI Facilities  
\*Nuclear Material Inspection, Idaho  
National Laboratory  
*\* projects finishing in December 2016*





Steve Beyerlein

# LETTER FROM THE CHAIR

The broad-based support expressed in the recent 36-hour Vandal Giving day, in year-in/year-out annual gifts, and in continuing teaching/research collaborations with regional industry is a trigger for reflection on what makes our engineering program special. Something I often share with prospective freshmen is that we are the residential design, analysis, and manufacturing experience of choice in the Pacific Northwest. This is a combination of **built pedagogy, just-in-time learning opportunities, and community engagement.**

In engineering context, built pedagogy translates into flexible meeting/working spaces, shop equipment, and access to engineering tools. Strongly-built pedagogy invites creativity, interaction, critical thinking, proof-of-concept prototyping, thoughtful experimentation, and public display of design artifacts. Our remodeled Gauss Johnson laboratory is heavily-endowed with built pedagogy. The machine shop, design suite, metrology lab, computer labs, ME 330 lab, graduate student offices, and Mindworks design review suite constitute an attractive complex that appeals to engineers of all ages. Many other programs across the country have such resources scattered about multiple buildings and hallways. Our contiguous, well-maintained, heavily utilized, 4000-ft<sup>2</sup> resource in the Gauss Johnson lab is indeed very special and distinctive.

**Just-in-time learning** is essential to efficient project work. This is epitomized in numerous QR codes witnessed around the design suite and in tool drawers within the shop. Via one's cellular phone, these are prompts for point-of-use learning. For those who haven't experienced these, the QR codes lead to linked wiki pages that explain use of machining tools, best practices in manufacturing, and responsible housekeeping. Student involvement in creating/ updating this resource is a regular component of our popular lean manufacturing short course. Each year, our repertoire of just-in-time learning opportunities at [www.mindworks.shoutwiki.com](http://www.mindworks.shoutwiki.com) grows larger and deeper. It is celebrated as a journey rather than an endpoint, just like one's way of being as a professional engineer.

**Community engagement** speaks to two objectives in the 2016-2025 UI strategic plan. These are under Goal 2 which is "**ENGAGE: outreach that inspires innovation and culture:**"

*...develop community, regional, national, and international collaborations which promote innovation and use University of Idaho research and creative expertise (i.e. design and manufacturing excellence) to address emerging issues.*

*...engage individuals (alumni, friends, stakeholders, and collaborators), business, industry, agencies and communities in meaningful and beneficial ways that support the University of Idaho mission.*

Clearly this is a two-way street where added-value is created both outside and inside the university. This engagement can be informal (via an alumni event in your geographic area like the one pictured with this column) or formal (like the surveys below that seek input for program planning). The first survey probes alumni feedback on "what mechanical engineers need to know about manufacturing." The other survey solicits stakeholder input on updated departmental Program Education Objectives which describe what our graduates should be able to do after 3-5 years on the job.



Enjoying an Alumni Social in Detroit, April 2016:

Gordan Jokic, Chantal Hieb, Stephen Hieb, Bobby Jackson (top of his head), Steve Beyerlein, Rory Lilley, Ben Palmer, Coye Johnson, Crystal Childress, Sam Childress. Cody Brumett snapped the picture.

### Mechanical Engineering Manufacturing Education Survey

<https://www.surveymonkey.com/r/KCRGK77>

### ABET Survey

<https://www.surveymonkey.com/r/c729cwk>

Another form of community engagement is joining our two-semester capstone design experience. The outcome of this collaboration is authentic learning and potentially ground-breaking project work. This begins with external partners taking the risk of suggesting a problem that they can't seem to get time to wrap their hands around, along with willingness to dedicate a fraction of their time each month to serving as a client for a senior design team. This also begins with young, classroom-smart engineering professionals who aren't sure where they fit in the modern workplace, and involves a team of committed and well-trained graduate student mentors who have been through the journey before, but are cultivating their skills in leading their peers. This also involves faculty and staff from across the college who may have been out of industry for a long period of time and who are discovering their niche in the 150-person organization that is our inter-disciplinary capstone design program. Over the next eight months, community engagement happens and everyone pitches in to make a difference. The ending is our annual Design Expo celebration in which many of you have contributed as exhibit and technical session judges—a signature moment for Vandal Engineering. The entire endeavor serves as an engineering-specific definition of engaged learning.

Partnering with you in multiple ways is a special gift that we all need to take time to cherish and to pay forward to future Vandal Engineers. I'm in. I know many of you are too. Thank you so much for your generous and ongoing support of our program.

## MECHANICAL ENGINEERING NEWS

is the newsletter of the  
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[www.uidaho.edu/engr/me](http://www.uidaho.edu/engr/me)

*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.*

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## 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](mailto:medept@uidaho.edu).



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Click "Give Now" and "Select a Fund Priority," type "mechanical" to search funds.

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