THE NORTHWEST'S LONGEST-RUNNING STUDENT ENGINEERING SHOWCASE

XXIII Twenty Third Annual

engineering ▪ design expo 2016

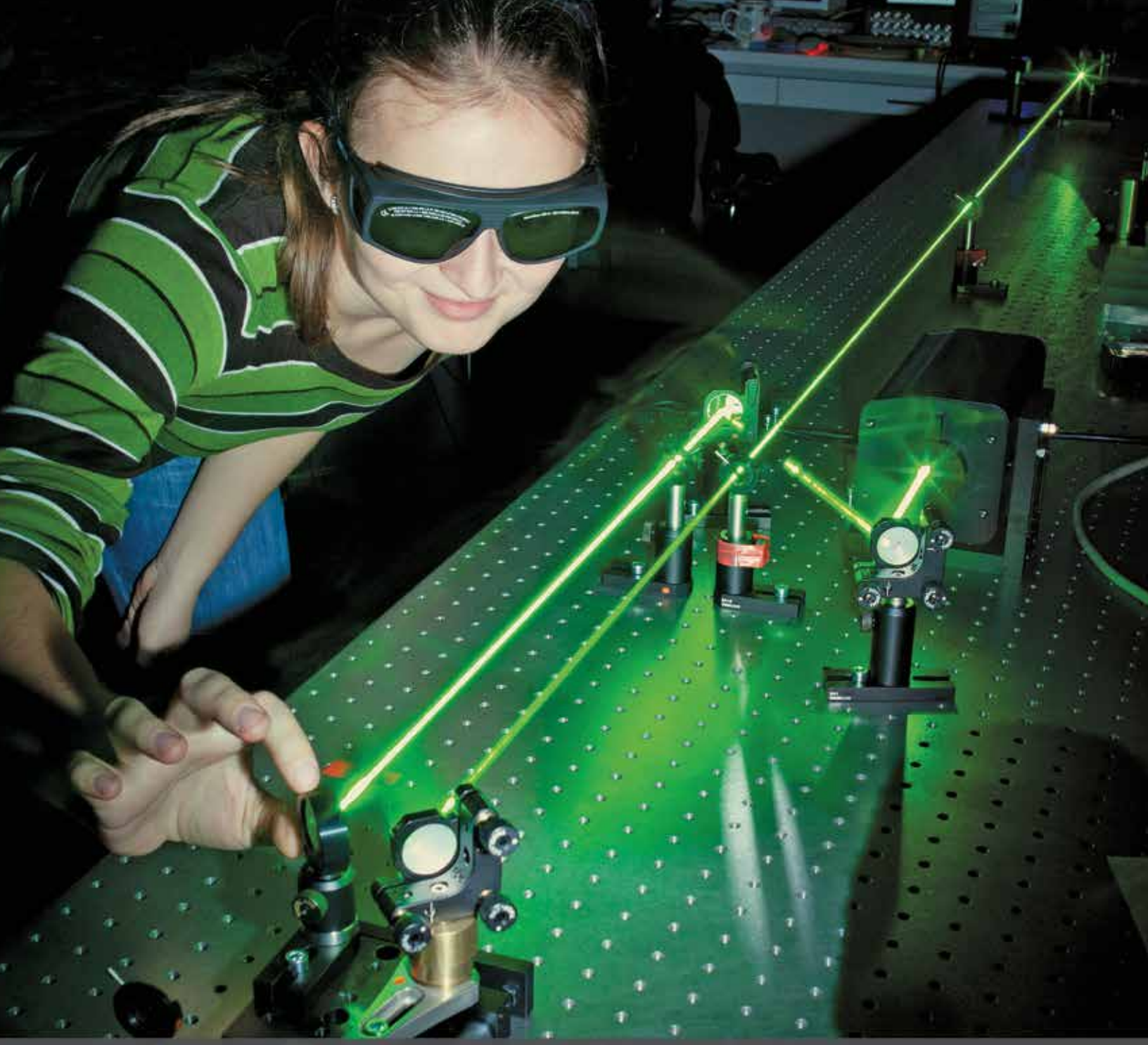
WHERE WILL ENGINEERING *TAKE YOU?*

April 29, 2016

Bruce M. Pitman Center (SUB)
University of Idaho | Moscow Campus

Presented by: Micron
and Engineering Outreach
at the University of Idaho

University of Idaho
College of Engineering

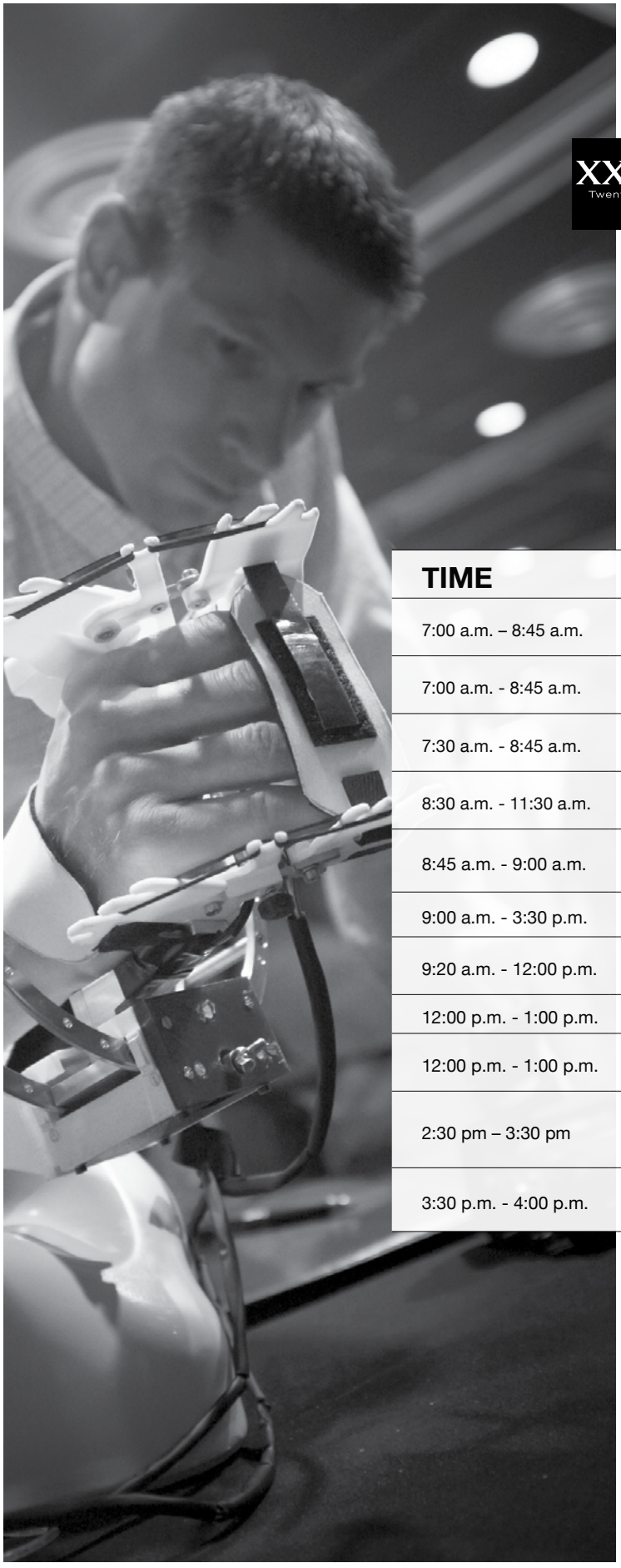


Official sponsors of tomorrow's tech

The Micron Foundation strives to build a strong community and promote robust education in the areas of science, technology, engineering and mathematics (STEM). Through our support of local non-profits, K-12 schools and universities, we support the communities where our employees live, work and volunteer.

We are proud to support students at the 2016 Engineering Design EXPO and the University of Idaho College of Engineering.

Micron Foundation



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engineering ▪ design expo2016

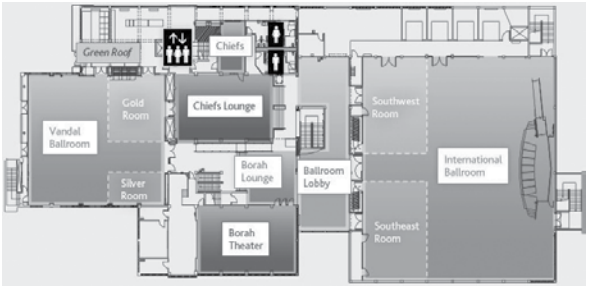
April 29

University of Idaho

BRUCE M. PITMAN STUDENT CENTER

(Student Union Building)

TIME	EVENT	PLACE
7:00 a.m. – 8:45 a.m.	Senior Design Student Check-In	Bruce M. Pitman Center 2nd floor
7:00 a.m. - 8:45 a.m.	Judges Check-In	Bruce M. Pitman Center 1st floor
7:30 a.m. - 8:45 a.m.	Judges Breakfast and Orientation	Vandal Ballroom
8:30 a.m. - 11:30 a.m.	Extended Experience K-12 Visitor Check-In	Bruce M. Pitman Center 1st floor
8:45 a.m. - 9:00 a.m.	Opening Ceremonies	Bruce M. Pitman Center 2nd Floor
9:00 a.m. - 3:30 p.m.	EXPO Hall Open	International Ballroom
9:20 a.m. - 12:00 p.m.	Technical Sessions	Borah Theater, Vandal, Gold and Silver Rooms
12:00 p.m. - 1:00 p.m.	Judges Lunch	Vandal Ballroom
12:00 p.m. - 1:00 p.m.	Senior Design Students Lunch	International Ballroom
2:30 pm – 3:30 pm	Keynote Speaker: Tom Mueller, Alumnus and Co-Founder of SpaceX	Vandal Ballroom
3:30 p.m. - 4:00 p.m.	Awards Ceremony	Vandal Ballroom



THANK YOU

2016 Engineering Design EXPO Sponsors

The University of Idaho, College of Engineering thanks all of our corporate and academic sponsors for their generous support of the 23nd annual Engineering Design EXPO. We value and appreciate our sponsors' participation and continued commitment to engineering education and EXPO.

Corporate Presenting Sponsor:

Academic Presenting Sponsor:

Sponsorship Opportunities

Planning Engineering Design EXPO is a yearlong activity. To explore future opportunities to support the University of Idaho's Engineering Design EXPO contact the College of Engineering Development team at 208-885-5201 or email us at expo@uidaho.edu. We look forward to talking with you about how you can help support EXPO and our current and future students.

Welcome to Engineering Design EXPO

It is my pleasure to welcome you to the 23rd Annual Engineering Design EXPO, the longest-running exposition in the Pacific Northwest, showcasing senior engineering capstone projects. For more than 125 years, the College of Engineering has been providing highly talented engineers to Idaho and the world. Our capstone design experience is the highlight of our engineering program. University of Idaho engineering students tackle real-world issues with the help of industry and academic partners. Our project sponsors provide the technical problems and our students provide solutions, gaining invaluable hands-on research and design experience in the process. It's a perfect match!

We have been hosting an exposition of our senior capstone projects for twenty-three years. This is a long time for any event. As such we like to create a different theme that highlights the essence of the event and our hopes for all EXPO visitors. This year's theme is *Where Will Engineering Take You?* The theme is of particular interest given this year's Honorary Chair and Keynote Speaker is UI alumnus Tom Mueller. Tom grew up the son of an Idaho logger and is now co-founder of SpaceX, a company founded to revolutionize space technology, with the ultimate goal of enabling people to live on other planets.

Over the years EXPO has grown in significance bolstering our educational process and our students' development. But it is not possible without the support of our industry partners and friends of the College of Engineering. We depend on your generous support to produce this quality event.

I want to specifically thank this year's corporate and academic presenting sponsors the Micron Foundation and Engineering Outreach at the University of Idaho for their generosity and commitment to EXPO. In addition, I want to thank all of the sponsors that support EXPO activities from our K-12 Extended Experience program to providing meals for our judges and capstone students. Thank you to the Avista Foundation, the Boeing Company, BP, the Center for Advanced Energy Studies, HP Inc., Idaho National Laboratories, Idaho Power, Itron, Lochsa Engineering, NASA Idaho Space Grant Consortium, Power Engineers, Schweitzer Engineering Laboratories and Wagstaff.

We are proud of the education and experiences that we provide to our students in the College of Engineering. As you visit EXPO I invite you to engage with our students to ask them about their projects and engineering designs, and to ask them the question *where engineering will take you?*

Finally, I want to thank all of our faculty, staff, students, judges and industry and academic partners who have helped shape EXPO these past two decades. We look forward to the next two decades and to learning all about the exciting places that *engineering takes you.*

Thank you for attending our event and your interest in our students' engineering excellence.

Sincerely,

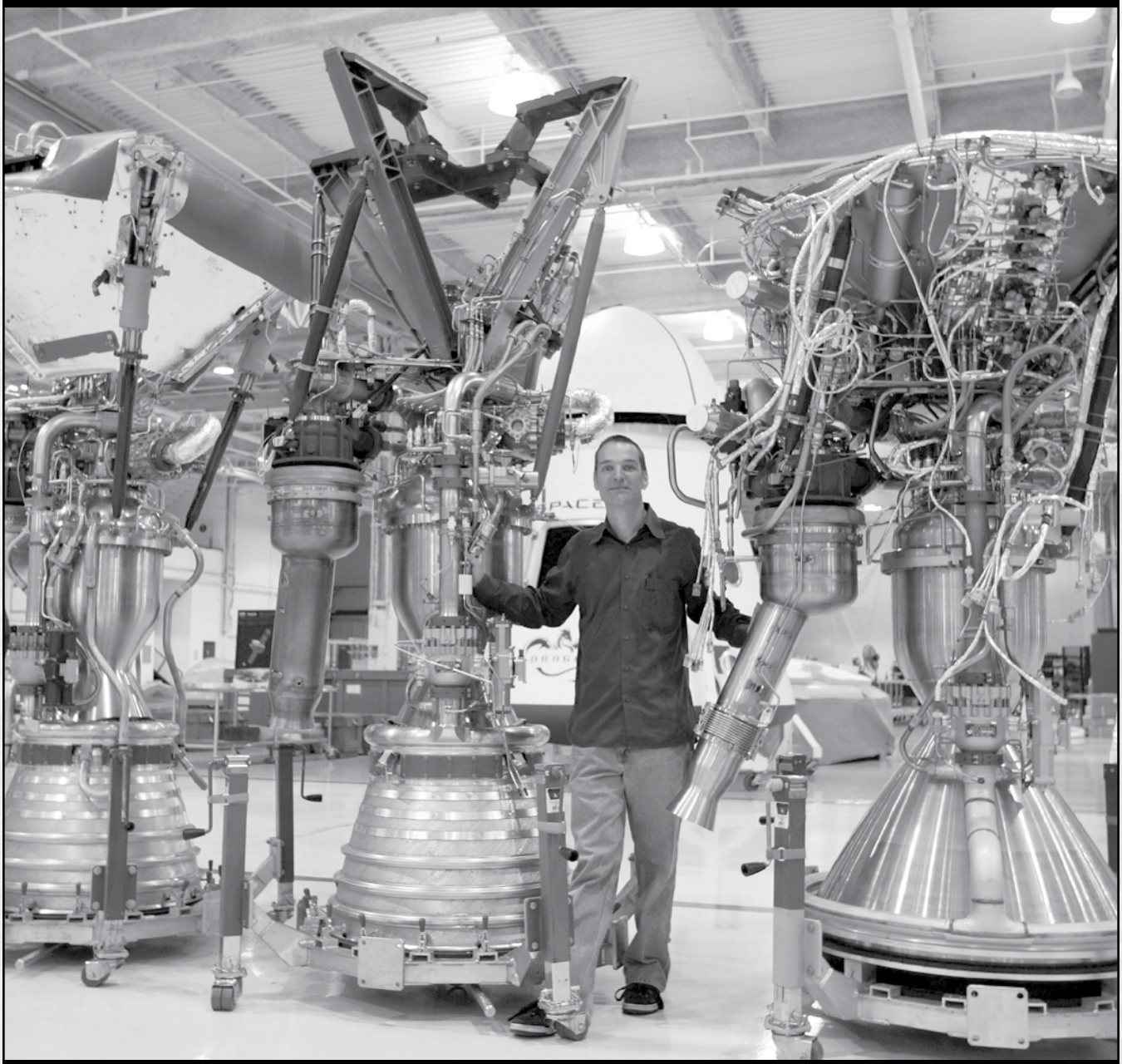
Larry Stauffer, Dean
University of Idaho, College of Engineering

2016 EXPO KEYNOTE ADDRESS

Honorary EXPO Chair Tom Mueller

Tom Mueller's story of how his interest in science led him to become an engineer and pursue a career in rocket engine development. Through his activities in professional and amateur rocket engine development he met Elon Musk, and helped found SpaceX as the Vice President of Propulsion. Tom's talk will also include insights into what SpaceX is doing now and future plans. Tom Mueller will present his keynote address at 2:30 p.m. in the Vandal Ballroom of the Bruce M. Pitman Center.

From Idaho Logger to SpaceX Founding Member



Keynote Address | 2:30 p.m. | Vandal Ballroom

THANK YOU

2016 Engineering Design EXPO Judges

A special thank you to all of the individuals who have taken time to lend their expertise as 2016 Engineering Design EXPO judges. Judges serve an essential role in the EXPO experience. Our senior design students gain invaluable insights through their interaction with EXPO judges. To all of our EXPO judges thank you for joining us today, your participation is greatly appreciated.

Edward Anderson - Battelle Energy Alliance
Sandy Anderson - CH2M-Hill, Idaho (Retired)
Phil Arpke - Wagstaff, Inc.
Ralph Barker - Hecla Limited - Lucky Friday Mine
Amanda Battles - Clearwater Paper
Pat Blount - Moscow High School
Bruce Bouton - The Boeing Company
Pietro Boyd - Nightforce Optics
Charles Buck - UI Coeur d'Alene
Ryan Carlson - Micron
Patricia Colberg - UI Civil Engineering
Dylan Dixon - Vista Outdoor (CCI Seer)
Joe Fugate - The Boeing Company
Gerry Galinato - Idaho Public Utilities Commission
Tom Gorman - UI College of Natural Resources
Matthew Gregg - Brown and Caldwell
Yvonne Hallock - Retired
Bob Hallock - Retired
Chris Hazelton - Coffman Engineers
Gary Hermann - Velsicol Chemical LLC (retired)
David Hollenback - K&N Industrial Equipment
Fred Jessup - Schweitzer Engineering Laboratories, Inc.
Kurran Kelly - BP
Jacob Leachman - Washington State University
Ken Mays - KMays Technical Services
Dan Newby - CNC Software, Inc.
Brad Okamoto – U.S. Bureau of Reclamation
Nicholai Olson - Tamarack Aerospace Group
Shawn Pratt - HP Inc.
Bruce Reilly - Arcadis
Kurt Ririe - Idaho National Laboratory
Pete Robichaud - Rocky Mt. Research Station
Jennifer Shawver - Unicep Packaging, LLC
John Shovic - SwitchDoc Labs
Steve Silkworth - Avista Corp.
Alex Simon - The Boeing Company
Mark Sipe - Coffman Engineers, Inc.
Jamison Slippy - Quest Aircraft Company
Tom Stalick - Kapstone Paper and Packaging
Eric Stubbs - Micron Technology
Todd Swanstrom - Western Trailer Co.
Cody Tews - Schweitzer Engineering Laboratories
Mike Thompson - Wagstaff, Inc.
Dillon Turnbull - Schweitzer Engineering Laboratories
Daniel Ulery - Nez Perce County
Nick Webb - Red Wire Services
Cal Williams - The Boeing Company
Thomas Zysk - Boeing Commercial Airplanes

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Vice President Product Management

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Board Chair

About the College of Engineering Senior Capstone Program

The University of Idaho's College of Engineering interdisciplinary senior capstone program is the foundation of our annual Engineering Design EXPO event. The program has evolved over its long history to become a catalyst for local and regional engineering design development. Our capstone program evolution has occurred as the result of a continuous stream of projects from regional industry, equipment donations from alumni and industry supporters, graduate student support, and educational research grants. As a result Engineering Design EXPO has become the Pacific Northwest's longest running engineering showcase and a signature event for the University of Idaho. Engineering Design EXPO is a unique opportunity for senior students to share the results of their team projects with the public, elementary and high school students, alumni, and industry partners.

THE SIX CORE VALUES OF OUR SENIOR CAPSTONE PROGRAM:

PROFESSIONAL INTEGRITY: day-to-day and long-term actions, aligned with professional codes of ethics in ways that are relevant and meaningful, responding to the needs of clients and society at large.

GROWTH ORIENTED: awareness of current knowledge, skills, and learning styles, informing self, peer, and mentor actions that elevate performance expectations while providing needed support for measurable change in professional behaviors and attitudes.

TECHNICALLY COMPETENT: enlightened use of engineering principles, early prototyping, modeling, experimentation, application of appropriate software tools, selection of state-of-the-art components, problem formulation & decomposition, and specification of manufacturing methods.

COLLABORATIVE: respectful, supportive, empowered community of practitioners promoting mutual understanding of diverse motivations and complementary skills while working towards a shared vision.

RESOURCE RICH: inspiring work environment providing ready access to prior work products, catalogs, instructional videos, software tutorials, and expert consultation as well as multiple opportunities to learn and use state-of-the art tools for computation and manufacturing.

VALUE ADDED: significant return on investment by developing compelling project goals that respond to stakeholder needs, innovating, measuring progress through systematic collection and analysis of data, assuming responsibilities needed for efficient and effective results, and compiling documentation that allows others to adopt solutions.

2016 EXPO Project Advisers

BIOLOGICAL ENGINEERING
- Dev Shrestha

CHEMICAL AND MATERIALS ENGINEERING
- John Canning
- David Drown
- Dean Edwards
- James Moberly
- Mark Roll

CIVIL ENGINEERING
- Kevin Chang
- Erik Coats
- Patricia Colberg
- Fritz Fiedler
- Ahmed Ibrahim
- Jim Liou
- Sunil Sharma

COMPUTER SCIENCE
- Bruce Bolden
- Robert Heckendorn
- Robert Rinker

ELECTRICAL AND COMPUTER ENGINEERING
- James Frenzel
- Herbert Hess
- Brian Johnson
- Feng Li
- Michael Santora

MECHANICAL ENGINEERING
- Steve Beyerlein
- Dan Cordon
- Michael Maughan
- Edwin Odom
- Joel Perry
- Russ Porter
- Behnaz Rezaie
- Matthew Riley
- Robert Stephens
- Eric Wolbrecht
- Tao Xing

CONGRATULATIONS TO ALL OF OUR UI ENGINEERING SENIOR DESIGN EXPO STUDENTS!

We congratulate you on a job well done and wish you the best in your future endeavors, wherever engineering may take you.

Joel Aguilera - Mechanical Engineering
Mark Aikey - Materials Science Engineering
Hatem Alatawi - Electrical Engineering
Faisal Abdulahadi Alhajri - Chemical Engineering
Majed Alkeaid - Electrical Engineering
Qasem AlNasser - Materials Science Engineering
Abdulmajeed Alotaibi - Computer Science
Khalid Alotaibi - Electrical Engineering
Jassim Alshammari - Chemical Engineering
Jason Alves-Foss - Computer Science
Jay Anderson - Mechanical Engineering
David Arnett - Electrical Engineering
Alexander Banks - Mechanical Engineering
Jackson Bates - Electrical Engineering
Colten Bernauer - Civil Engineering
Casey Blair - Computer Science
Jason Borth - Mechanical Engineering
Andrew Brackenbusch - Mechanical Engineering
Zachary Branter - Chemical Engineering
Allie Brown - Chemical Engineering
Adriana Carbon - Chemical Engineering
Jesse Caudle - Mechanical Engineering
Zihua Chen - Electrical Engineering
Michael Clark - Mechanical Engineering
Kyle Cleveland - Mechanical Engineering
Marc Compton - Mechanical Engineering
Gregory Cotten - Mechanical Engineering
Chad Crow - Civil Engineering
Isaac Curtis - Materials Science Engineering
David Daigle - Electrical Engineering
Trent Dalton - Mechanical Engineering
Scott Damiani - Electrical Engineering
Ali Dashti - Mechanical Engineering
Kirk Delmas - Mechanical Engineering
Dillon Downing - Electrical Engineering
Jessica Drouin - Mechanical Engineering
Jeremiah Dustin - Chemical Engineering
Alan Edwards - Mechanical Engineering
Essa Essa - Electrical Engineering
Cristofer Farnetti - Mechanical Engineering
Joseph Fergeson - Computer Engineering
Josie Flerchinger - Biological Engineering
Christopher Fraser - Mechanical Engineering
Alberto Garcia - Mechanical Engineering
Saroja Geibel - Civil Engineering
Dillon Glover - Mechanical Engineering
Christopher Goes - Computer Science
Kendall Gregory - Computer Science
Bret Grote - Civil Engineering
Chase Guyer - Computer Science
Robert Hale - Civil Engineering
Garrett Hall - Mechanical Engineering
Stephen Hanes - Electrical Engineering
Regan Hansen - Civil Engineering
Alec Harrison - Biological Engineering
Daniel Hartzell - Civil Engineering
Brian Hayes - Electrical Engineering
Diego Hernandez - Electrical Engineering
Morgan Holbart - Computer Science
Evan Holbert - Electrical Engineering
Sean Hollenbeck - Civil Engineering
Nicholas Howe - Mechanical Engineering
Tyler Hutten - Mechanical Engineering
Sean Iiams - Civil Engineering
Tyler Jaszkowiak - Computer Science
Alexx Jensen - Mechanical Engineering
Tao Jia - Biological Engineering
Diego Juarez - Mechanical Engineering
Katherine Keller - Civil Engineering
Jason Kemp - Computer Science
Anthony Keys - Mechanical Engineering
Kyle Knapp - Chemical Engineering
Lukas Kury - Civil Engineering
Jessica Lake - Chemical Engineering
Meagan Larrea - Civil Engineering
Taylor Lecates - Civil Engineering
Jieun Lee - Chemical Engineering
Garrison Lewis - Mechanical Engineering
Evan Lovel - Electrical Engineering
Bruno Loza - Electrical Engineering
Patrick Lutskas - Mechanical Engineering
Emily Mariner - Chemical Engineering
Monte McKinnon - Electrical Engineering
Chet McKinnon - Mechanical Engineering
Nathan Mcleod - Mechanical Engineering
Salley Mei - Mechanical Engineering
Abigail Messegee - Civil Engineering
Gavin Meyer - Electrical Engineering
Charles Miller - Computer Science
Cody Moldenhauer - Electrical Engineering
Kelly Moore - Mechanical Engineering
Tyler Moroney - Chemical Engineering
Noah Morris - Civil Engineering
Sarah Munds - Computer Science
McQuaid Murray - Mechanical Engineering
Steven Nieuwenhuis - Mechanical Engineering
Felix Nwanne - Chemical Engineering
Brionna Olenichak - Mechanical Engineering
Austin Olsby - Mechanical Engineering
David Park - Mechanical Engineering
William Parker - Electrical Engineering
Brian Patterson - Electrical Engineering
Gabe Pearhill - Computer Science
Jeffery Porter - Chemical Engineering
Arthur Putnam - Computer Science
Joel Ratcliffe - Electrical Engineering
Ryan Ready - Electrical Engineering
Robert Regent - Mechanical Engineering
Jacquelin Remaley - Mechanical Engineering
Philip Richardson - Electrical Engineering
Brandy Rinaldi - Chemical Engineering
Zachary Robertson - Mechanical Engineering
Robert Roman - Electrical Engineering
Josh Roper - Chemical Engineering
Andrew Roybal - Mechanical Engineering
Steven Sainsbury - Mechanical Engineering
Nicholas Saras - Civil Engineering
Daniel Schmalz - Electrical Engineering
Jordan Scott - Electrical Engineering
Kayden Scott - Electrical Engineering
Ethan Scott - Mechanical Engineering
Sean Shepherd - Computer Science
Jeffrey Siddoway - Chemical Engineering
Jacob Skaug - Electrical Engineering
Timothy Slippy - Computer Engineering
Chase Smith - Mechanical Engineering
Travis Soderquist - Biological Engineering
Carlos Solis - Computer Engineering
Adam Spencer - Chemical Engineering
Antonius Stalick - Computer Science
Greg Standerford - Biological Engineering
Austin Steiner - Mechanical Engineering
Christopher Steinmetz - Civil Engineering
Thomas Stewart - Mechanical Engineering
Jackson Stipe - Biological Engineering
Nikolas Taylor - Computer Engineering
Bryan Tiniacos - Mechanical Engineering
Cameron Toskey - Chemical Engineering
Kylie Touchstone - Mechanical Engineering
Sydney Tracy - Chemical Engineering
Brian Tucker - Electrical Engineering
Chad Vorse - Electrical Engineering
Michael Wanless - Mechanical Engineering
Lance Wells - Computer Science
Christie Wendle - Civil Engineering
Jace Westcott - Mechanical Engineering
James Wilson - Electrical Engineering
Tyler Wittreich - Computer Science
Morgan Wood - Chemical Engineering
Samantha Woodman - Electrical Engineering
Kevin Woodruff - Mechanical Engineering
Zachary Yama - Computer Science
Joseph Zabriskie - Computer Engineering

Grand Challenges Scholars Program

The University of Idaho, College of Engineering has committed to establishing a program designed to prepare a minimum of 20 students annually to lead the way in meeting challenges identified by the National Academy of Engineering that are key to maintaining and improving quality of life across the globe.

5 Key Components of the Grand Challenges Scholar Program

Research Experience
Interdisciplinary Curriculum
Entrepreneurship
Global Dimension
Service Learning

For more information about the program and how to apply visit:

www.uidaho.edu/grandchallenges

NAE GRAND CHALLENGES FOR ENGINEERING
NATIONAL ACADEMY OF ENGINEERING

University of Idaho
College of Engineering

14 GRAND CHALLENGES FOR ENGINEERING IN THE 21ST CENTURY

2016 EXPO TECHNICAL PRESENTATIONS

Technical presentations are approximately 15 minutes and will take place in multiple locations in the Bruce M. Pitman Center between 9 a.m. and 12 noon. (Borah Theater, Vandal Ballroom, Silver Room, Gold Room and Cataldo Room). Schedules will be posted.

Presentation Title	Description
A.P.E.S. (Automated Plant Environment Shield)	The A.P.E.S. team has created a modular, automated, consistent, plant covering shield that blocks all light from reaching the poinsettias at night. The design uses a hemispherical method combined with a spring loaded arm to cover each side of the poinsettias completely.
Adjustable Governor for Synchronous Generator	The team is designing, simulating, and implementing closed-loop frequency control on a small power generator located in the University of Idaho Advanced Power Lab. The control-loop governs the existing system such that it dynamically responds as if it were a different, larger generator powered by hydroelectric, steam, or gas.
Automated Synchronous Generator Black Start System	When power goes out, generator field current must be supplied by batteries to re-start before reverting to using the generator itself to power field excitation; this is a black-start. We designed and implemented a black-start system for the generator in GJ Lab and modeled it in Real Time Digital Simulation.
Autonomous Robots	The goal of this project is to use the Commercial-Off-The-Shelf (COTS) autonomous robot platform and add inter-robot communication and autonomy to perform cooperative tasks.
Blackcloud Creek Culvert Replacement	The purpose of this project is to replace a problematic culvert on Blackcloud Creek with a new crossing structure. The intent is to improve hydraulic capacity in order to mitigate flooding of adjacent properties and resolve the perched outlet to allow upstream fish passage for spawning.
Boeing Workstation to Hold Various Rib Sizes for Assembly Operations	Create a modular workstation that can be scaled to grip and manipulate ribs ranging from 5'-17' in length for light assembly work. A complete workstation includes lighting and tool balancers, as well as design considerations for ease of use and ergonomics.
Boise Greenbelt	As a large and growing urban area, the city of Boise, Idaho and surrounding towns have established a greenbelt along the Boise River from Lucky Peak Reservoir to Eagle, ID. The team was tasked with designing an undeveloped path section that included two tunnels, retaining walls, and pathway design.
CLEAN Ideas: Removal of Pharmaceuticals from Wastewater for Human Consumption.	Reuse of wastewater is becoming a necessity in regions with limited access to water. A two column filtration and Activated Carbon-Ozone reactor system has been designed to clean wastewater effluent and remove unregulated pharmaceuticals from solution. This makes wastewater effluent potable for potential reuse in the drinking supply.
Cryogenic Recycling of Haul Truck Tires	Open-pit mines generate thousands of waste tires each year that are mostly buried on-site, posing various environmental hazards. Although recycling possibilities exist, most are infeasible due to isolated mining locations. A mobile system paired with cryogenics to make recycling opportunities feasible for mine sites was developed.
Cushman Pump Station and Pipeline Design	We are designing a pump station and a pipeline for a fish hatchery.
DeVlieg Innovation Project - Compressor/Tank and Electrolyzer: Personalized Hydrogen Cell Refueling Station	This project is a compressor and tank design for a personalized hydrogen cell refueling station. The compressor and tank prototypes are run using nitrogen gas for proof of concept. The compressor pressurizes from 15 psi to 500 psi. The tank then cools the gas to a liquid. The project also includes an electrolysis chamber for a personalized hydrogen cell refueling station. It uses a membrane reactor to convert water into hydrogen gas through electrolysis. It produces half a mole per second of hydrogen which would theoretically be input into a compressor to be liquefied.
DeVlieg innovation Project - Determining the Effects of Swabbing Woodwind Mouthpieces	Many saxophone and clarinet players have differing opinions on whether it is harmful to swab mouthpieces after playing their instrument. This project tests whether swabbing causes any physical damage to the mouthpiece or causes enough damage to change the tone produced by the mouthpiece.
Heavy Metal Trap	This sampler design will monitor harmful and volatile organometallic molecules in river and lake beds. Organometallics occur naturally, and the rate of generation depends on the amount of heavy metal in the sediments. This sampler was designed to measure the evolution rate of these gases, as well as trap them to be analyzed at a lab offsite.
Humetrics Series 1	Humetrics Series 1 uses a thermoelectric cooling system and bubbler chamber to control temperature and humidity of a fixed volume chamber. The goal of this project is to control temperature and humidity to minimize controller response time.

Presentation Title	Description
Improvement of Lead-Acid Battery Performance with Conductive Ceramic Fibers Using a Recycled Tire Feedstock	Tires were used as a feedstock to deposit a highly conductive carbon matrix onto ceramic fibers. Those fibers were incorporated into lead acid battery positive plates, increasing the overall performance of the battery through increased positive-plate active material utilization.
Innovate Heat Recovery for a Power Converter	To improve the efficiency of a power converter using Thermal Electric Generators coupled with a Two-phase steam cycle to dissipate and harness waste heat. The waste heat is then turned into electrical energy to provide isolated power to the control system.
Innovative Mechanical Flue Gas Separator	The innovative mechanical flue gas separator, inspired by Vorsana's patent, is an environmentally friendly and non-chemical alternative to flue gas separators currently on the market. This separator uses pure mechanical forces to separate pollutants in the flue gas. Extensive prototype tests were conducted to verify the effectiveness of this method.
Integrated Rocket Ramjet	Design and model an integrated rocket ramjet. The engine transitions without sacrificial parts from the rocket to the ramjet stage upon reaching the design speed. Key features include a sealing inlet and a liquid fuel ignition source that doubles as a barrier to shield components from the solid rocket propellant.
Lewiston Orchards Irrigation District Well No. 5	A deep well has been dug to provide irrigation and possible drinking water lines to Lewiston's Mann Lake and Lewiston residence. We will select pumps, design the well house layout and piping, and design a pump pad to secure pumps.
Nampa Wastewater Treatment Plant Secondary Digester	Our group has been tasked with finding a solution for the failing secondary digesters at the Nampa, ID WWTP. The new design will include environmental, geotechnical, structural and hydraulic components.
Potlatch Northbound Passing Lane Project	The objective of this project is to realign US-95 in between its intersections within SH-6 in Potlach, Idaho. We will work with the Idaho Transportation Department to change the speed limit from 55 miles per hour to 65 miles per hour.
Robosub	In collaboration with WSU Electrical and Computer Science Engineers, this team of four U of I Mechanical Engineers work to design, build and test a fully autonomous submarine. The rover will compete at the International ROBOsub competition in San Diego, California, where it will traverse through an underwater obstacle course.
Saline Solution	With an increasing need for fresh water, new low-energy and cost-efficient green technology to extract salt from water has become attractive. Our team uses electrical fields and high surface area nanomaterials to create a lossy capacitor that separates the sodium and chlorine ions.
Substation in a Box	The goal of this project is to build an interactive demo unit for Schweitzer Engineering Laboratories Industrial Control System security classes. The end product will be a simple substation with an easy to read visualization that responds to a variety of security scenarios.
University of Idaho Formula Hybrid Team	The University of Idaho Formula Hybrid Team is comprised of both undergraduate and graduate students. We design, manufacture, and test a formula hybrid race car to compete in the international Formula Hybrid competition. The object of this competition is to create the fastest, most efficient, and most reliable race car.
University of Idaho Industrial Assessment Center	The IAC team conducts energy audits for small and medium manufactures at no cost, identifying opportunities to improve productivity, reduce waste, and save energy. The booth and presentation this year focus on a lighting transition case study. Come see the effects of light and energy!
Using Magnetic Nanoparticles to Clean Acidic Mine Drainage Water	Acidic drainage from abandoned mines can be harmful to the environment and toxic to life. Systems currently used to treat the drainage can be overwhelmed by seasonal increases from snow melt. This system will use plates coated with magnetic nanoparticles to adsorb iron and other contaminants near the source, providing a buffer to primary treatment systems.
Web Based Security Hardening Guides	A cloud based repository of multi-platform security guides for non-technical users. The project is self-contained: anyone can create their own instance of the system.
World Record Party Wheel	We created a 6-foot diameter spinning machine that is capable of displaying LED images from across the Kibbie Dome Stadium. This world record breaking machine will be used by the Idaho marching band to enrich the vandal game day experience.

A.P.E.S. (AUTOMATED PLANT ENVIRONMENT SHIELD)

The A.P.E.S. team has created a modular, automated, consistent, plant covering shield that blocks all light from reaching the poinsettias at night. The design uses a hemispherical method combined with a spring loaded arm to cover each side of the poinsettias completely.

Sponsor: Bob Tripepi
Sponsor Organization: College of Agricultural and Life Sciences
Team Members:
Andrew Brackebusch - Mechanical Engineering
Daniel Flick - Agricultural Engineering
Tyler Hutten - Mechanical Engineering
Jackson Stipe - Agricultural Engineering

Faculty Advisor(s): Dev Shrestha

ADJUSTABLE GOVERNOR FOR SYNCHRONOUS GENERATOR

The team is designing, simulating, and implementing closed-loop frequency control on a small power generator located in the University of Idaho Advanced Power Lab. The control-loop governs the existing system such that it dynamically responds as if it were a different, larger generator powered by hydroelectric, steam, or gas.

Sponsor: Normann Fischer, Stephanie McDaid and Brian Johnson
Sponsor Organization: Schweitzer Engineering Laboratories, Inc. and UI Department of Electrical and Computer Engineering
Team Members:
Hatem Alatawi - Electrical & Computer Engineering
Majed Alkeaid - Electrical & Computer Engineering
Kayden Scott - Electrical & Computer Engineering
Chad Vorse - Electrical & Computer Engineering

Faculty Advisor(s): Brian Johnson, Feng Li

ARM AND HAND MOBILITY ASSISTANCE, MONITORING, AND REHABILITATION

Three projects were developed during a new ME Technical Elective on Assistive Technologies for Physical Impairment: 1) improved hand-opening assistance via modification of a commercially-available SaeboFlex, 2) development of a wearable sensing device for arm use monitoring, and 3) finger and thumb rehabilitation training module for use with UI's PARTNER robot.

Sponsor: Joel Perry
Sponsor Organization: UI Department of Mechanical Engineering
Team Members:
Nik Butler - Mechanical Engineering
Stephen Goodwin - Mechanical Engineering
Bridger Hopkins - Mechanical Engineering
Kyle Petersen - Mechanical Engineering
Jeremiah Schroeder - Mechanical Engineering
Shawn Trimble - Mechanical Engineering

Faculty Advisor(s): Joel Perry

ASCE CONCRETE CANOE AND STEEL BRIDGE

The Concrete Canoe and Steel Bridge on display were entered into design competitions held at the American Society of Civil Engineers (ASCE) Pacific Northwest Student Conference in April at the University of Idaho. Some 400 students from universities and colleges from Alaska, Washington, Idaho and Oregon participated.

Sponsor Organization: American Society of Civil Engineers (ASCE)
Team Members: American Society of Civil Engineers (ASCE) Students

Faculty Advisor(s): Kevin Chang

AUTOMATED SYNCHRONOUS GENERATOR BLACK START SYSTEM

When power goes out, generator field current must be supplied by batteries to re-start before reverting to using the generator itself to power field excitation; this is a black-start. We designed and implemented a black-start system for the generator in GJ Lab and modeled it in Real Time Digital Simulation.

Sponsor: Nikhil Pai
Sponsor Organization: Schweitzer Engineering Laboratories, Inc.
Team Members:
Khalid Alotaibi - Electrical & Computer Engineering
Bruno Loza - Electrical & Computer Engineering
William Parker - Electrical & Computer Engineering

Faculty Advisor(s): Brian Johnson, Feng Li

AUTONOMOUS ROBOTS

The goal of this project is to use the Commercial-Off-The-Shelf (COTS) autonomous robot platform and add inter-robot communication and autonomy to perform cooperative tasks.

Sponsor: Terence Soule
Sponsor Organization: UI Department of Computer Science
Team Members:
Abdulmajeed Alotaibi - Computer Science
Jordan Lynn - Computer Science

Faculty Advisor(s): Robert Heckendorn
Mentor(s): Bruce Bolden, Travis DeVualt, Jordan Lynn

AVISTA MICROGRID AUTOMATED GENERATOR CONTROLLER DESIGN

To design and model an automated generator controller for two hydro-generators operating in an emergency micro-grid scenario.

Sponsor: Erik Lee
Sponsor Organization: Avista
Team Members:
Ian King - Electrical & Computer Engineering
Conner Warner - Electrical & Computer Engineering
Gigi Young - Electrical & Computer Engineering

Faculty Advisor(s): Herbert Hess

BAND-BEESTEN: CODE NAME IVORY

Project Ivory combines principles of Mechanical and Computer Engineering to create a Mobile Instrument Component for the Sound of Idaho Marching Band by incorporating a well-wired drivetrain, a modular piano, and excellent showmanship for a spectacular half-time show.

Sponsor: Spencer Martin
Sponsor Organization: University of Idaho Vandal Marching Band
Team Members:
Derek Eaton - Mechanical Engineering
Brionna Olenichak - Mechanical Engineering
Tim Slippy - Electrical & Computer Engineering
Thomas Stewart - Mechanical Engineering
Nikolas Taylor - Electrical & Computer Engineering

Faculty Advisor(s): Edwin Odom, Steven Beyerlein, Robert Rinker
Mentor(s): Theron White

WHERE WILL ENGINEERING TAKE YOU?

ASK UI BIOLOGICAL ENGINEERING STUDENT

LUCAS SASS

Lucas has a passion for engineering and organic chemistry. As an undergraduate student, Lucas is working with faculty with expertise in biomedical engineering to create 3-D models called phantoms of the cerebral spinal fluid system. They want to understand how the fluid impacts neurological disease and how to create new drug delivery methods. Lucas hopes to pursue a medical or advanced degree and a University of Idaho biological engineering education has helped him get to where he wants to be.

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BATTERY ULTRACHARGER

The goal is to create a battery pack which can charge within 2 minutes and then use that power to recharge a phone. It will be compact and easy to move around, making it a great fit for people on the go with not a lot of time to spare.

Sponsor: Herbert Hess
Sponsor Organization: UI Department of Electrical and Computer Engineering
Team Members:
Keith Leitner - Electrical & Computer Engineering
Robert Prew - Electrical & Computer Engineering

Faculty Advisor(s): Herbert Hess

BIO-DIESEL REACTOR INNOVATION

The University of Idaho has been a pioneer in producing bio-fuels and developing better methods for many years. Currently, the process is outdated and unsafe. Our task is to add heat and introduce chemicals in a safer and more accurate way.

Sponsor: Keegan Duff
Sponsor Organization: UI Department of Biological Engineering
Team Members:
Jessica Curtis - Biological Engineering
McQuaid Murray - Mechanical Engineering
Ethan Scott - Mechanical Engineering
Cameron Snow - Biological Engineering
Greg Standerford - Biological Engineering

Faculty Advisor(s): Dev Shrestha
Mentor(s): Keegan Duff

BLACKCLOUD CREEK CULVERT REPLACEMENT

The purpose of this project is to replace a problematic culvert on Blackcloud Creek with a new crossing structure. The intent is to improve hydraulic capacity in order to mitigate flooding of adjacent properties and resolve the perched outlet to allow upstream fish passage for spawning.

Sponsor: Ben Davis
Sponsor Organization: TerraGraphics Environmental Engineering
Team Members:
Regan Hansen - Civil Engineering
Meagan Larrea - Civil Engineering
Chris Steinmetz - Civil Engineering

Faculty Advisor(s): Fritz Fiedler
Mentor(s): Amed Ibrahim

BOEING WORKSTATION TO HOLD VARIOUS RIB SIZES FOR ASSEMBLY OPERATIONS

Create a modular workstation that can be scaled to grip and manipulate ribs ranging from 5'-17' in length for light assembly work. A complete workstation includes lighting and tool balancers, as well as design considerations for ease of use and ergonomics.

Sponsor: Kyle Griner
Sponsor Organization: Boeing Frederickson Skin and Spar
Team Members:
Austin Chmelik - Mechanical Engineering
Kyle Cleveland - Mechanical Engineering
Diego Juarez - Mechanical Engineering
Lucas Sass - Biological Engineering

Faculty Advisor(s): Matthew Riley
Mentor(s): Theron White

BOISE GREENBELT

As a large and growing urban area, the city of Boise, Idaho and surrounding towns have established a greenbelt along the Boise River from Lucky Peak Reservoir to Eagle, Idaho. The team was tasked with designing an undeveloped path section that included two tunnels, retaining walls, and pathway design.

Sponsor: Don Carnahan
Sponsor Organization: Keller and Associates
Team Members:
Daniel Hartzell - Civil Engineering
Lukas Kury - Civil Engineering
Justin Scheel - Civil Engineering
Christie Wendle - Civil Engineering

Faculty Advisor(s): Fritz Fiedler, Sunil Sharma, Ahmed Ibrahim
Mentor(s): Chris Comstock

CLEAN IDEAS: REMOVAL OF PHARMACEUTICALS FROM WASTEWATER FOR HUMAN CONSUMPTION

Reuse of wastewater is becoming a necessity in regions with limited access to water. A two column filtration and Activated Carbon-Ozone reactor system has been designed to clean wastewater effluent and remove unregulated pharmaceuticals from solution. This makes wastewater effluent potable for potential reuse in the drinking supply.

Sponsor: IEE/WERC
Sponsor Organization: New Mexico State University
Team Members:
Kyle Knapp - Chemical & Materials Engineering
Adam Spencer - Chemical & Materials Engineering
Sydney Tracy - Chemical & Materials Engineering
Morgan Wood - Chemical & Materials Engineering

Faculty Advisor(s): David Drown, James Moberly
Mentor(s): David MacPherson, Charles Cornwall, Greg Moller

CRYOGENIC RECYCLING OF HAUL TRUCK TIRES

Open-pit mines generate thousands of waste tires each year that are mostly buried on-site, posing various environmental hazards. Although recycling possibilities exist, most are infeasible due to isolated mining locations. A mobile system paired with cryogenics to make recycling opportunities feasible for mine sites was developed.

Sponsor: IEE/WERC
Sponsor Organization: New Mexico State University
Team Members:
Allie Brown - Chemical & Materials Engineering
Adriana Carbon - Chemical & Materials Engineering
Isaac Curtis - Chemical & Materials Engineering
Emily Mariner - Chemical & Materials Engineering

Faculty Advisor(s): David Drown
Mentor(s): Charles Cornwall, Dave MacPherson

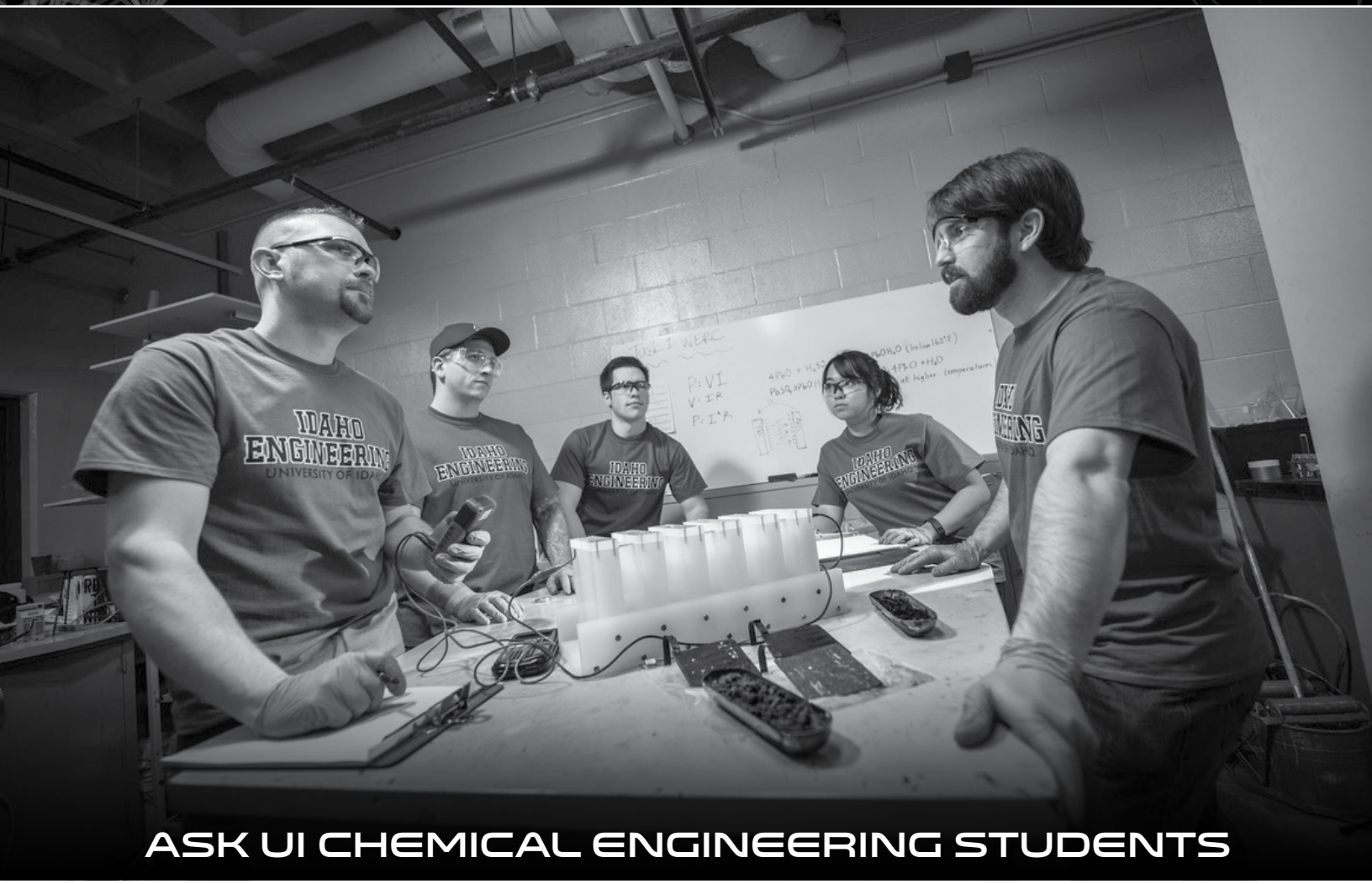
CUSHMAN PUMP STATION AND PIPELINE DESIGN

We are designing a pump station and a pipeline for a fish hatchery.

Sponsor: Bryant Charlo
Sponsor Organization: Deere and Ault Consultants, Inc.
Team Members:
Bret Grote - Civil Engineering
Robert Hale - Civil Engineering
Sean Hollenbeck - Civil Engineering
Paul Loska - Civil Engineering

Faculty Advisor(s): Fritz Fiedler

WHERE WILL ENGINEERING TAKE YOU?



ASK UI CHEMICAL ENGINEERING STUDENTS

"J-TEAM"

Josh Roper, Jeremiah Dustin, Jeff Porter, Jieun Lee and Jesse Hinshaw are "J-Team." They are working on a project that could have a significant impact on battery power technology and the environment. They have the opportunity to participate in an annual international environmental design competition in New Mexico. J-Team hopes to bring home a win with a pioneering process that uses recycled tires as a battery additive to increase overall battery performance. A University of Idaho chemical and materials engineering education has helped J-Team innovate and compete.

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DEVLIEG - DETERMINING THE EFFECTS OF SWABBING WOODWIND MOUTHPIECES

Many saxophone and clarinet players have differing opinions on whether it is harmful to swab mouthpieces after playing their instrument. This project tests whether swabbing causes any physical damage to the mouthpiece or causes enough damage to change the tone produced by the mouthpiece.

Sponsor: DeVlieg Innovation Fellowship
Sponsor Organization: Engineering Scholars
Team Members:
Brooke Deans - Mechanical Engineering
Jennifer Hunt - Electrical & Computer Engineering
David Pick II - Mechanical Engineering
Courtney Wanke - Mechanical Engineering

Faculty Advisor(s): Mark Roll

DEVLIEG - COMPRESSOR/TANK: PERSONALIZED HYDROGEN CELL REFUELING STATION

This project is a compressor and tank design for a personalized hydrogen cell refueling station. The compressor and tank prototypes are run using nitrogen gas for proof of concept. The compressor pressurizes from 15 psi to 500 psi. The tank then cools the gas to a liquid.

Sponsor: DeVlieg Innovation Fellowship
Sponsor Organization: Engineering Scholars
Team Members:
Cooper Atkinson - Mechanical Engineering
Taylor Davis - Chemical & Materials Engineering
Stafford Morse - Mechanical Engineering
Paden Putnam - Mechanical Engineering
Sam Schaffer - Electrical & Computer Engineering
Nick Shaber - Mechanical Engineering
Kathryn Simpson - Chemical & Materials Engineering
JT Sutton - Mechanical Engineering

Faculty Advisor(s): Robert Stephens

DEVLIEG - ELECTROLYZER: PERSONALIZED HYDROGEN CELL REFUELING STATION

This project is an electrolysis chamber for a personalized hydrogen cell refueling station. It uses a membrane reactor to convert water into hydrogen gas through electrolysis. It produces half a mole per second of hydrogen which would theoretically be input into a compressor to be liquefied.

Sponsor: DeVlieg Innovation Fellowship
Sponsor Organization: Engineering Scholars
Team Members:
Avery Brock - Electrical & Computer Engineering
Aaron Burton - Electrical & Computer Engineering
Ned Caisley - Electrical & Computer Engineering
Taylor Davis - Chemical & Materials Engineering
Alyssa Ertel - Chemical & Materials Engineering
Cameron Murdock - Electrical & Computer Engineering
Kasey Peach - Chemical & Materials Engineering

Faculty Advisor(s): Robert Stephens

ENGINE PACKAGING

A design focused on the packaging of two motorcycle engines to one transmission. Decreasing the engine envelope and allowing for a tighter and more efficient use of engine space.

Sponsor: Edwin Odom
Sponsor Organization: UI Department of Mechanical Engineering
Team Members:
Dustin Clelland - Mechanical Engineering
James Founds - Mechanical Engineering

Faculty Advisor(s): Edwin Odom
Mentor(s): Jacob Gilles

ENVIRONMENTAL ENGINEERING RESEARCH LABORATORY DEMONSTRATION/EXHIBITION

Graduate and undergraduate students from the Environmental Engineering Laboratory in the Civil Engineering Department will showcase and discuss UI research activities related to resource recovery from wastewater.

Sponsor: Erik Coats
Sponsor Organization: UI Department of Civil Engineering
Team Members:
Ben Carleton - Chemical & Materials Engineering
Karina Eyre - Civil Engineering
Eric Hughes - Civil Engineering
Derek Probst - Civil Engineering
Taylor Romenesko - Civil Engineering

Faculty Advisor(s): Erik Coats

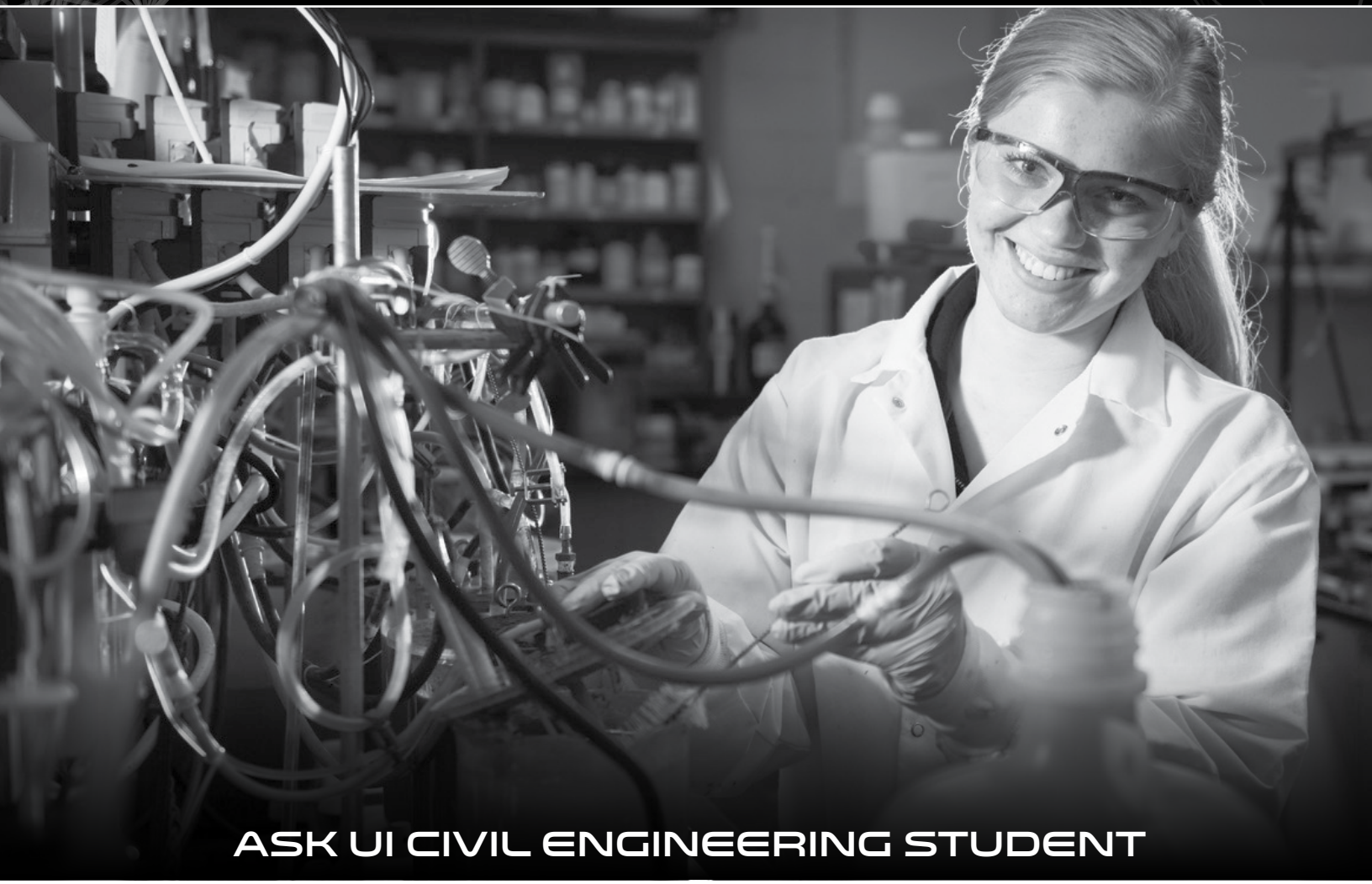
EWB-UI WATER SUPPLY PROJECT WATER FOR FAMILIES "WHERE THERE IS NOTHING"

The University of Idaho student chapter of Engineers Without Borders (EWB-UI) is working with the indigenous community of Carani, Bolivia on a sustainable water supply project to improve access to water and water quality in Carani. In August 2016, we will build a pipeline and water storage tank to serve part of Carani.

Sponsor: EWB-UI Donors
Sponsor Organization: Engineers Without Borders UI Student Chapter
Team Members:
Nate Bemis - Civil Engineering
Marissa Dean - Microbiology
Monica Erickson - Civil Engineering
Nigel Hebbeln - Chemical & Materials Engineering
Amanda Murdock - Chemical & Materials Engineering
William Parker - Electrical & Computer Engineering
Erin Poor - Civil Engineering
Courtney Sell - Civil Engineering
Simon Shindler - Chemical & Materials Engineering

Faculty Advisor(s): Fritz Fiedler

WHERE WILL ENGINEERING TAKE YOU?



ASK UI CIVIL ENGINEERING STUDENT

KARINA EYRE

Karina loves being challenged and solving problems. She is working with civil engineering faculty and researchers with expertise in upcycling organic waste and wastewater treatment. She is getting hands-on research experience on a project to improve processes that remove nitrogen and phosphorus from city and farm wastewaters. Karina knows challenges surrounding water and the environment are big, but helping solve those big problems is where she wants to be and a University of Idaho civil engineering education has helped her get there.

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WHERE WILL ENGINEERING TAKE YOU?

HOW ABOUT DOWN A RIVER IN A CONCRETE CANOE

as part of the annual American Society of Civil Engineers (ASCE) student conference. Civil engineering students from across the Pacific Northwest gather to test their designs in concrete canoe races and steel bridge building competition events. This year our Vandal civil engineering teams our playing host to 19 schools with 400 participants ready to paddle their canoes down the Snake River.

HELP OUR UI ENGINEERS GET THERE

Participation in the ASCE conference and competition events gives our students first-hand experience with designing and building as a team while learning project management. All of these skills are incredibly valuable to our future engineering practitioners and leaders. But sustaining concrete canoe and steel bridge building teams is expensive. Consider a gift of any size to help our Vandal teams stay afloat and or on a bridge above water.

Contact our Engineering Development team today!

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FLEET SERVICE RESPONDER - REDEFINING TROUBLESHOOTING OF ENTERPRISE PRINTERS

Design and develop an application that provides service acknowledgement for discovered issues for HP printers. This application will assist the user by getting an immediate response from a technician, and will provide value to a business by improving client relations and providing quick recovery of a failed system.

Sponsor: Shawn Pratt
Sponsor Organization: Hewlett-Packard
Team Members:
Cody Helbling - Computer Science
Gavin Quinn - Computer Science
Arthur Putnam - Computer Science

Faculty Advisor(s): Bruce Bolden

FLIGHT MANAGEMENT AND DATA ACQUISITION SYSTEM FOR A DYNAMICALLY-SCALED MODEL AIRPLANE

Full-scale test airplanes are expensive to build. Our team has created a dynamically scaled model that flies like a full-scale Kodiak aircraft. Our on-board data acquisition/management system collects data from the model's sensors during flight. These can be validated against sensors on the full-scale aircraft.

Sponsor: Kevin Breneman
Sponsor Organization: Quest Aircraft Company
Team Members:
Benjamin Clark - Mechanical Engineering
Evan Holbert - Electrical & Computer Engineering
Nathaniel Meager - Mechanical Engineering
Caleb Morgan - Mechanical Engineering
Kelly Moore - Mechanical Engineering
Jacob Skaug - Electrical & Computer Engineering
Austin Wahl - Electrical & Computer Engineering

Faculty Advisor(s): Steven Beyerlein, Edwin Odom
Mentor(s): Justin Pettingill

FLYCAM - FLYWHEEL CONTROL AND MONITORING

A storage system of any kind is useless without a control interface. Our user-friendly design allows for precise control of Idaho's Flywheel Energy Storage System. Additionally, it provides intuitive monitoring of the Flywheel's performance.

Sponsor:
Sponsor Organization:
Team Members:
Ben Bolton - Electrical & Computer Engineering
Jesse Jutson - Computer Science
Thomas Hagen - Computer Science
Eric Silk - Electrical & Computer Engineering

Faculty Advisor(s): Feng Li, Michael Santora.

HEAT EXCHANGER TUBE REMOVAL TECHNOLOGY

Develop an extraction process for heat exchanger tubes that have failed during production and are detected by performing a leak test. The end goal is to reduce the waste of the whole heat exchanger when the tube has split and it is unable to be removed.

Sponsor:
Sponsor Organization: Colmac Coil Manufacturing Inc.
Team Members:
Alan Edwards - Mechanical Engineering
Tony Keys - Mechanical Engineering

Andy Roybal - Mechanical Engineering

Faculty Advisor(s): Michael Maughan
Mentor(s): Jake Gilles

HEAVY METAL TRAP

This sampler design will monitor harmful and volatile organometallic molecules in river and lake beds. Organometallics occur naturally, and the rate of generation depends on the amount of heavy metal in the sediments. This sampler was designed to measure the evolution rate of these gases, as well as trap them to be analyzed at a lab offsite.

Sponsor: James Moberly
Sponsor Organization: UI Department of Chemical and Materials Engineering
Team Members:
Scott Ramsdell - Chemical & Materials Engineering
William Reichlinger - Chemical & Materials Engineering
Jeffry Siddoway - Chemical & Materials Engineering
Cameron Toskey - Chemical & Materials Engineering

Faculty Advisor(s): David Drown, James Moberly

HOW WATER EXPLODES!

Civil Engineering students will demonstrate a water hammer (and other marvels of the hydraulic world) A water hammer is a pressure surge caused when a fluid in motion is forced to stop or abruptly change.

Sponsor: Jim Liou
Sponsor Organization: UI Department of Civil Engineering
Team Members:
Sean Hollenbeck - Civil Engineering

Faculty Advisor(s): Jim Liou

HUMETRICS SERIES 1

Humetrics Series 1 uses a thermoelectric heating/cooling system and bubbler chamber to control temperature and humidity of a fixed volume chamber. The goal of this project is to control temperature and humidity to minimize controller response time.

Sponsor: Martin Buehler
Sponsor Organization: Decagon Devices
Team Members:
Mark Aikey - Chemical & Materials Engineering
Qasem Alnasser - Chemical & Materials Engineering
Jessica Lake - Chemical & Materials Engineering
Felix Nwanne - Chemical & Materials Engineering

Faculty Advisor(s): David Drown
Mentor(s): David MacPherson

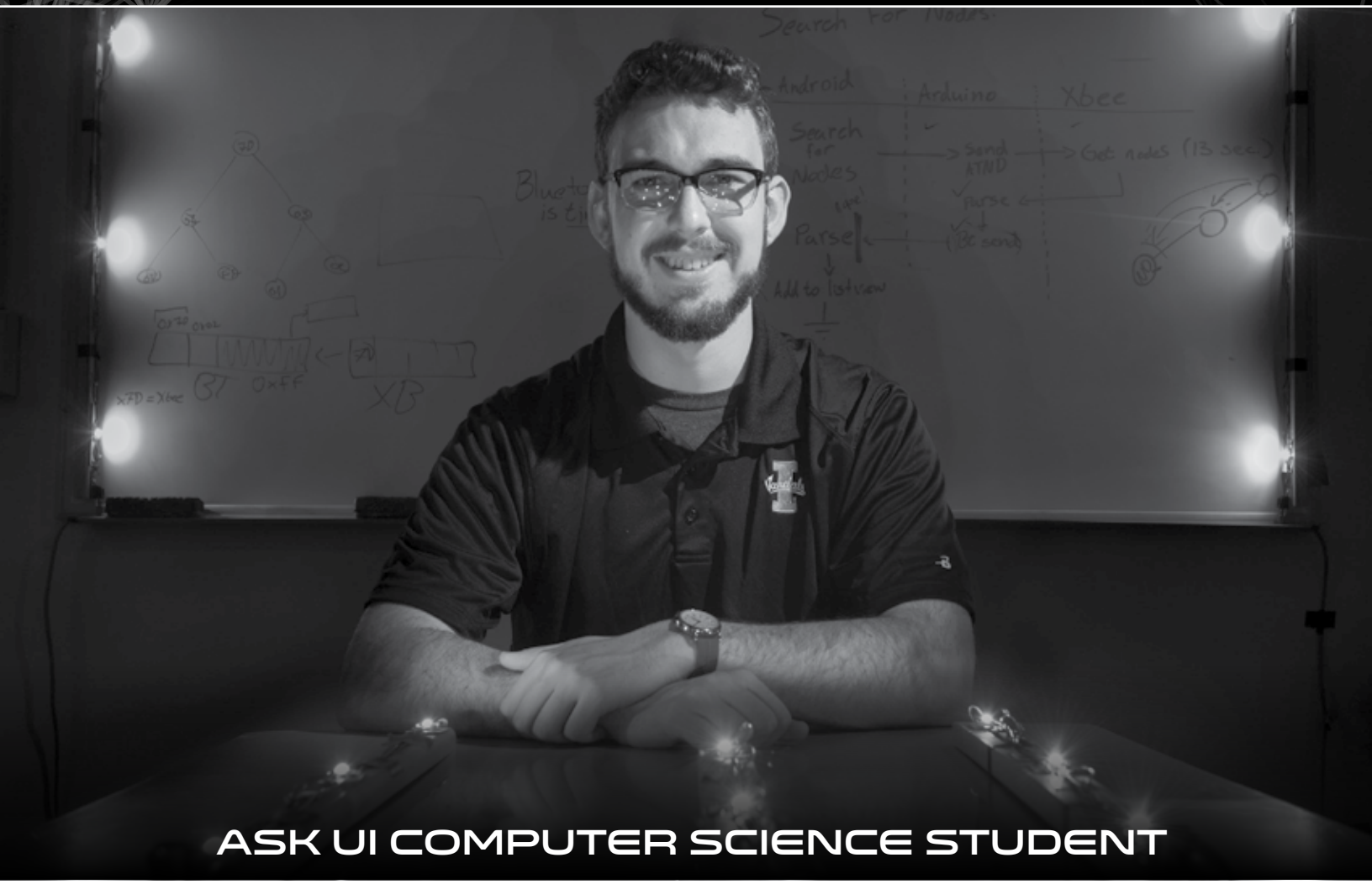
IMPROVEMENT OF LEAD-ACID BATTERY PERFORMANCE WITH CONDUCTIVE CERAMIC FIBERS USING A RECYCLED TIRE FEEDSTOCK

Tires were used as a feedstock to deposit a highly conductive carbon matrix onto ceramic fibers. Those fibers were incorporated into lead acid battery positive plates, increasing the overall performance of the battery through increased positive-plate active material utilization.

Sponsor: IEE/WERC
Sponsor Organization: New Mexico State University
Team Members:
Seth Dustin - Chemical & Materials Engineering
Jesse Hinshaw - Chemical & Materials Engineering
Jieun Lee - Chemical & Materials Engineering
Jeff Porter - Chemical & Materials Engineering
Josh Roper - Chemical & Materials Engineering

Faculty Advisor(s): David Drown, Dean Edwards, John Canning
Mentor(s): David MacPherson, Charles Cornwall

WHERE WILL ENGINEERING TAKE YOU?



ASK UI COMPUTER SCIENCE STUDENT

JESSE JUTSON

Jesse has a passion for computer programming and is president of the UI Chapter of the Association for Computing Machinery (ACM). Every year ACM students like Jesse work to develop creative solutions to integrate computer science into campus life. They literally light up the Vandal Marching Band with LEDs and produce the Theophilus Tower Lights extravaganza for the entire Moscow community. Jesse believes that knowing how to program the computers that surround us is like having a superpower — a power aided with the help of a University of Idaho computer science education.

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INCREASING BATTERY PERFORMANCE USING COATED GLASS MICROSPHERES

Using the bulk electrolyte storage of porous hollow glass microspheres and coating them with the highly conductive carbon from the University of Idaho Thermalized Asphalt Reaction (GUITAR) to improve battery performance. The goal was to optimize the process of making enough GUITAR coated PHGM's to test battery plates, compare with today's battery technology, and design a full-scale production plant.

Sponsor:
Sponsor Organization: UI Department of Chemical and Materials Engineering
Team Members:
Ty Moroney - Chemical & Materials Engineering
Brady K. Rinaldi - Chemical & Materials Engineering
Martin Taylor - Chemical & Materials Engineering

Faculty Advisor(s): David Drown, Dean Edwards, John Canning

INNOVATE HEAT RECOVERY FOR A POWER CONVERTER

To improve the efficiency of a power converter using Thermal Electric Generators coupled with a Two-phase steam cycle to dissipate and harness waste heat. The waste heat is then turned into electrical energy to provide isolated power to the control system.

Sponsor: Herbert Hess
Sponsor Organization: UI Department of Electrical and Computer Engineering
Team Members:
Jackson Bates - Electrical & Computer Engineering
Greg Cotten - Mechanical Engineering
Harrison Pugesek - Mechanical Engineering
Samantha Woodman - Electrical & Computer Engineering

Faculty Advisor(s): Herbert Hess, Behnaz Rezaie
Mentor(s): Theron White

INNOVATIVE MECHANICAL FLUE GAS SEPARATOR

The innovative mechanical flue gas separator, inspired by Vorsana's patent, is an environmentally friendly and non-chemical alternative to flue gas separators currently on the market. This separator uses pure mechanical forces to separate pollutants in the flue gas. Extensive prototype tests were conducted to verify the effectiveness of this method.

Sponsor: David McCutchen
Sponsor Organization: Vorsana Inc.
Team Members:
Josie Flerchinger - Biological Engineering
Garrett Hall - Mechanical Engineering
Travis Soderquist - Biological Engineering

Faculty Advisor(s): Tao Xing, Behnaz Rezaie
Mentor(s): Scott Smith, Jacob Gilles

INTEGRATED ROCKET RAMJET

Design and model an integrated rocket ramjet. The engine transitions without sacrificial parts from the rocket to the ramjet stage upon reaching the design speed. Key features include a sealing inlet and a liquid fuel ignition source that doubles as a barrier to shield components from the solid rocket propellant.

Sponsor: John Crepeau
Sponsor Organization: UI Department of Mechanical Engineering
Team Members:
Jesse Caudle - Mechanical Engineering
Marc Compton - Mechanical Engineering
Christopher Fraser - Mechanical Engineering
Alexx Jensen - Mechanical Engineering

Faculty Advisor(s): Michael Maughan
Mentor(s): Jacob Gilles

LEWISTON ORCHARDS IRRIGATION DISTRICT WELL NO. 5

A deep well has been dug to provide irrigation and possible drinking water lines to Lewiston's Mann Lake and Lewiston residence. We will select pumps, design the well house layout and piping, and design a pump pad to secure pumps.

Sponsor: David Watkins
Sponsor Organization: J-U-B Engineers
Team Members:
Colten Bernauer - Civil Engineering
Saroja Geibel - Civil Engineering
Justin Maffey - Civil Engineering
Andrew Skinner - Civil Engineering

Faculty Advisor(s): Fritz Fiedler
Mentor(s): Erik Coats, Ahmed Ibrahim

LIGHTENING CREEK WARMING HUT

This project involved designing a warming hut for winter back country travelers in the Idaho Panhandle National Forest. The hut has a footprint of 20'x40' and a maximum height of 18'. The only source of heat is a fire-pit with ventilation hood and chimney. The structure is uninsulated, has no plumbing or electricity, and the floor is gravel. A separate pre-cast pit latrine will be installed on site by the Forest Service.

Sponsor: Eric Eldenburg
Sponsor Organization: James A. Sewell & Associates
Team Members:
Abdullah Almakrab - Civil Engineering
Katherine Keller - Civil Engineering
Abigail Messegee - Civil Engineering

Faculty Advisor(s): Fritz Fiedler
Mentor(s): Matthew Miller

ME 301 & ME 401 COURSE PROJECTS

Computer aided design students share their work on semester projects. Projects include topics such as advanced modelling, rendering, testing, collaborative design, and simulation.

Sponsor:
Sponsor Organization: UI Department of Mechanical Engineering
Team Members:
ME 301 and 401 students

Faculty Advisor(s): Michael Maughan, Edwin Odom

MEASUREMENT OF HUMAN TRUNK STIFFNESS AND STABILITY

Continued development of a device designed to measure axial and torsional stiffness in the core muscles of the human body. Gathered data will be used to associate muscle reaction patterns with changes in mobility due to age, height, weight, neurological disorders and other psycho-physical factors.

Sponsor: Rajal Cohen
Sponsor Organization: UI Department of Psychology & Communication Studies
Team Members:
Sally Mei - Mechanical Engineering
Robert Regent - Mechanical Engineering
Jacquelin Remaley - Mechanical Engineering
Austin Steiner - Mechanical Engineering

Faculty Advisor(s): Joel Perry, Eric Wolbrecht
Mentor(s): Dillon Savage

WHERE WILL ENGINEERING TAKE YOU?

ASK UI ELECTRICAL ENGINEERING STUDENT

ALEXA AGUILAR

Alexa wants to develop energy harvesting technology. Under the mentorship of University of Idaho professors she has had the opportunity to work at Micron Technology in her home town of Boise. She plans to use that real-world experience when she starts an internship at NASA's Jet Propulsion Laboratory in California this summer. Alexa's hope is to one day convert common free form phenomena like sounds vibrations into useable energy sources and her University of Idaho electrical engineering education is helping her get there.

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CYBER GRAND CHALLENGE FINALISTS

When the University of Idaho's Jim Alves-Foss and Jia Song compete in the Cyber Grand Challenge this August, they won't look like programmers in the movies or in typical cybersecurity competitions. They won't spend the day at their computers, hunting for vulnerabilities and attacking other teams.

All they'll have to do, says Song, is hit "start."

"What we need to do during the competition is start running our tools, and it will automatically patch the code and look for vulnerabilities," she says.

The Cyber Grand Challenge, sponsored by the Pentagon's Defense Advanced Research Projects Agency, invites computer scientists and programming whizzes from around the world to design cybersecurity programs that can identify and repair weaknesses without human help.

Song, a research assistant professor in the University of Idaho Computer Science Department, and Alves-Foss, a computer science professor, make up team CSDS, sponsored by the UI College of Engineering's Center for Secure and Dependable Systems.

Song first came to UI in fall 2009 for graduate school and earned her doctoral degree in 2014. Alves-Foss, is a founding member and now director of the Center for Secure and Dependable Systems.

Team CSDS the smallest team in the contest — but they're ready to take on their competitors.

Song and Alves-Foss placed second in a qualifying event in June 2015, landing one of just seven spots in the finals alongside teams from places like Carnegie Mellon University, the Raytheon Company and the University of California, Berkeley.

They also earned $750,000 to improve their software suite, which has been Song's full-time occupation since joining the CSDS faculty in 2016. Her part of the project focuses on designing tools to identify system vulnerabilities, while Alves-Foss develops tools to automatically patch them. They both have been striving to make their programs faster and more thorough.

With the August competition on the horizon, Team CSDS is excited to show what their programs can do.

Regardless of whether they walk away with the $2 million grand prize, Song says they're eager to continue working on their software, making it increasingly flexible so it can run on any operating system and be used by any software developer to check whether the programs they're designing are secure.

"We all care about our information, our privacy. Computers and networks are used very commonly in our lives," she says. "Everyone needs to make sure their stuff is secure — their information and their identity."

Article by Tara Roberts, University Communications & Marketing

NAMPA WASTEWATER TREATMENT PLANT SECONDARY DIGESTER

Our group has been tasked with finding a solution for the failing secondary digesters at the Nampa, ID WWTP. The new design will include environmental, geotechnical, structural and hydraulic components.

Sponsor: Matt Gregg
Sponsor Organization: Brown and Caldwell
Team Members:
Trevor Jones - Civil Engineering
Jonathan Landa - Civil Engineering
Taylor LeCates - Civil Engineering
Allen Taylor-Stiffarm - Civil Engineering

Faculty Advisor(s): Fritz Fiedler

NEWATER BIOCHAR INJECTION SYSTEM

With a growing need for clean water and reusable resources, the Biochar Filtration system allows for us to effectively create both. We have been tasked with creating a mixing and injection system that will accurately dose Biochar into the cleaning system that can be altered for larger scale if necessary.

Sponsor: Greg Moller
Sponsor Organization: N-E-W Tech
Team Members:
Tao Jia - Biological Engineering
Garrison Lewis - Mechanical Engineering
Nicholas Richards - Biological Engineering
Han Zhou - Biological Engineering

Faculty Advisor(s): Dev Shretha
Mentor(s): Martin Baker

OPERATION GENERAL CONVERTER START-UP

Team Kill-A-Watt will design and build an innovative way of starting the NAVY's 250kW general power converter. Our final design will start the converter using an input between 100Vrms and 600Vrms, AC or DC, and run for the first few minutes while the converter warms up to the point where team HEET's thermo-electric generators can take over with self-sustained operation.

Sponsor:
Sponsor Organization: U.S. NAVY
Team Members:
Matthew Klein - Electrical & Computer Engineering
Nathan Gaul - Electrical & Computer Engineering
Jake Querubin - Electrical & Computer Engineering
Abdencio Sanchez - Electrical & Computer Engineering

Faculty Advisor(s): Herb Hess
Mentor(s): Amrit Dahal

POTLATCH NORTHBOUND PASSING LANE PROJECT

The objective of this project is to realign US-95 in between its intersections within SH-6 in Potlach, Idaho. We will work with the Idaho Transportation Department to change the speed limit from 55 miles per hour to 65 miles per hour.

Sponsor: Jared Hopkins
Sponsor Organization: Idaho Transportation Department
Team Members:
Delanie Cornwell - Civil Engineering
Bryan Jensen - Civil Engineering
Noah Morris - Civil Engineering
Sung Chae Ryu - Civil Engineering
Nick Saras - Civil Engineering

Faculty Advisor(s): Fritz Fiedler
Mentor(s): Ahmed Ibrahim, Fouad Bayomy, S. J. Jung

REDESIGNING THE SATELLITE TELEMETRY BOARD

The NASA Ames Research Center is responsible for various cube satellites, suborbital experiments, and high altitude balloons. The goal of this project is to design a new revision of a circuit board that both enables a modem to connect to the internet and supports auxiliary equipment for NASA's activities.

Sponsor: Jonathan Wheless
Sponsor Organization: NASA
Team Members:
Alexia Doramus - Computer Science
Diego Hernandez - Electrical & Computer Engineering
Sarah Munds - Computer Science
Daniel Schmalz - Electrical & Computer Engineering
Jordan Scott - Electrical & Computer Engineering
Joseph Zabriskie - Electrical & Computer Engineering

Faculty Advisor(s): Feng Li, Bruce Bolden

RED-YELLOW-GREEN: AN INSIDER'S GUIDE TO TRAFFIC SIGNALS

Civil Engineering students will demonstrate the 'art and engineering' of designing traffic signalling.

Sponsor: Kevin Chang
Sponsor Organization: NIATT
Team Members:
Riannon Zender - Civil Engineering

Faculty Advisor(s): Kevin Chang

REHABILITATION TRAINING SYSTEM

We are building a software that helps occupational therapists with the rehabilitation process of a stroke patient. With the software the therapist can create game based routines that support and accelerate the patient's recovery. Having game based routines makes the process more engaging and motivates the patient to practice more.

Sponsor: Doug Weeks
Sponsor Organization: St. Lukes Rehabilitation Institute

Team Members:
Kendall Gregory - Computer Science
Chase Guyer - Computer Science
Michael Mueller - Computer Science

Faculty Advisor(s): Bruce Bolden, Joel Perry

RIFLE SCOPE IMPACT TESTING DEVICE FOR NIGHTFORCE OPTICS

Currently Nightforce Optics manual impacts each scope that goes through the line, our mission was to make this process automatic. We developed an automatic pendulum to consistent hit the scope. Which can apply different forces depending on the operator's needs. It improved safety and decreases human error.

Sponsor: Pietro Boyd
Sponsor Organization: Nightforce Optics, Inc
Team Members:
Jay Anderson - Mechanical Engineering
Jason Borth - Mechanical Engineering
Dillon Glover - Mechanical Engineering
Kylie Touchstone - Mechanical Engineering

Faculty Advisor(s): Michael Maughan
Mentor(s): Dillon Savage

WHERE WILL ENGINEERING TAKE YOU?

HOW ABOUT ON A 100 MILE SNOWMOBILE RIDE

competing in the annual Clean Snowmobile Challenge (CSC) at Michigan Technological University's, Keweenaw Research Center located in Upper Michigan Peninsula.. For the past 16 years the University of Idaho CSC Team has competed in the Society of Automotive Engineers (SAE) International CSC event. The team has won over 50 awards and is the 2015 and 2016 back-to-back Founder's Trophy award winner, something no other team in competition history has accomplished.

HELP OUR UI ENGINEERS GET THERE

Our students gain invaluable experience reengineering an existing snowmobile to reduce emissions and noise on the interdisciplinary Clean Snowmobile Challenge team. But sustaining a SAE International collegiate design series snowmobile team is expensive. Consider a gift of any size to help our Vandal team continue its tradition of engineering excellence.

Contact our Engineering Development team today!

208-885-5201 or engr-development@uidaho.edu | uidaho.edu/engr/give

A POWERFUL PARTNERSHIP

This past fall electrical and computer engineering Professor Brian Johnson was named the first Schweitzer Engineering Laboratories Chair in Power Engineering. The position was made possible by a $2 million gift from Schweitzer Engineering Laboratories (SEL).

"We are delighted that Brian Johnson is the first SEL Chair in Power Engineering," said Ed Schweitzer, SEL founder and president. "He's already made such a big impact on so many students, and we hope this growing partnership between SEL and the University of Idaho will further amplify and expand his influence and work."

Johnson is internationally recognized in the field of power engineering and is a senior member of the Institute of Electrical and Electronics Engineers (IEEE), where he holds officer positions on several technical committees. He is former chair of the UI Department of Electrical and Computer Engineering and has served as the primary investigator on over 50 research projects totaling more than $7 million in external funding. Most notable about Johnson's career is his dedication to students and power engineering education. Over the course of the past 23 years, Johnson has advised 170 graduate students in Moscow and globally through the College of Engineering's Engineering Outreach online education program. He has also successfully mentored 44 students to receive their certificate in Power Systems Protection and Relaying.

"I'm honored to be selected as the first Schweitzer Engineering Laboratories Chair in Power Engineering," Johnson said. "I'm excited about the possibilities the new step in our relationship with SEL offers to increase opportunities to excite students about power engineering and strengthen their understanding through courses, design projects and research."

SEL and UI's College of Engineering have long enjoyed a valuable local partnership benefiting both organizations, students and employees.

SEL currently employs over 250 UI alumni across the globe. Twenty-five SEL employees are currently enrolled at the UI and SEL provides internships for 58 UI students.

SEL invents, designs and builds digital products and systems that protect power grids around the world. This technology prevents blackouts and enables customers to improve power system reliability, safety and cost.

"In order for SEL to continue its rich tradition of innovation, we need highly educated engineers who really understand the fundamentals of electric power systems," said Dave Whitehead, SEL VP of R&D. "The students coming out of UI are able to begin contributing at a high level on day one."

"We believe this partnership will not only benefit the university and SEL, but it will also help us solve the tough problems related to protecting, monitoring and controlling electric power — which will help make the world a better place."

ROBOSUB

In collaboration with WSU Electrical and Computer Science Engineers, this team of four U of I Mechanical Engineers work to design, build and test a fully autonomous submarine. The rover will compete at the International ROBOsub competition in San Diego, California, where it will traverse through an underwater obstacle course.

Sponsor: Mike Kapus
Sponsor Organization: Navsea
Team Members:
Dylan Christianson - Mechanical Engineering
Michael Clark - Mechanical Engineering
Kirk Delmas - Mechanical Engineering
Jace Westcott - Mechanical Engineering

Faculty Advisor(s): Matthew Riley
Mentor(s): Shawn Trimble

ROBOTIC BURROW EXPLORATION

We have designed a robot to explore and map the burrows of pygmy rabbits and burrowing owls. The robot is controlled from a PC and sends video back to the operator. A suite of sensors allows the robot to measure the burrow as it explores.

Sponsor: Courtney Conway and Janet Rachlow
Sponsor Organization: UI College of Natural Resources
Team Members:
Xihua “Jake” Chen - Electrical & Computer Engineering
Stephen Hanes - Electrical & Computer Engineering
Brett Menzies - Computer Science
Lance Wells - Computer Science

Faculty Advisor(s): Bruce Bolden, Joel Perry

ROBOTICALLY ASSISTED MANUFACTURING CELL

Hundreds of nut plate assemblies are built everyday using human labor. In addition to contributing to workplace injury, these tasks can result in the accumulation of process errors. This project aims to create an automated work cell using an industrial robot which can tirelessly and consistently perform these assembly tasks.

Sponsor: Edward Jensen
Sponsor Organization: Boeing Company
Team Members:
Trent Dalton - Mechanical Engineering
Nick Howe - Mechanical Engineering
David Park - Mechanical Engineering
Michael Wanless - Mechanical Engineering

Faculty Advisor(s): Steve Beyerlein
Mentor(s): Justin Pettingill, David Park

SALINE SOLUTION

With an increasing need for fresh water, new low-energy and cost-efficient green technology to extract salt from water has become attractive. Our team uses electrical fields and high surface area nanomaterials to create a lossy capacitor that separates the sodium and chlorine ions.

Sponsor: David McCutchen
Sponsor Organization: Vorsana Inc.
Team Members:
Essa Essa - Electrical & Computer Engineering
Austen Doutre - Mechanical Engineering
Jessica Drouin - Mechanical Engineering
Cody Moldenhauer - Electrical & Computer Engineering
Ryan Ready - Electrical & Computer Engineering
Kevin Woodruff - Mechanical Engineering

Faculty Advisor(s): Tao Xing, Herbert Hess
Mentor(s): Theron White

SUBSTATION IN A BOX

The goal of this project is to build an interactive demo unit for Schweitzer Engineering Laboratories Industrial Control System security classes. The end product will be a simple substation with an easy to read visualization that responds to a variety of security scenarios.

Sponsor: Jess Smith
Sponsor Organization: Schweitzer Engineering Laboratories Inc.
Team Members:
David Daigle - Electrical & Computer Engineering
Robert Roman - Electrical & Computer Engineering
Brian Hayes - Electrical & Computer Engineering
Joe Ferguson - Electrical & Computer Engineering

Faculty Advisor(s): Feng Li, Brian Johnson

SUPERCONDUCTIVE LEVITATING FLYWHEEL SYSTEM

The University of Idaho Flywheel Energy Storage System is a magnetically levitated and controlled field regulated reluctance machine. Functioning as both a motor and a generator, this vacuum enclosed machine experiences virtually no frictional losses. Thus, it is perfect for long-term energy storage, a critical step towards future moon colonization.

Sponsor: Michael Santora
Sponsor Organization: UI Department of Electrical and Computer Engineering
Team Members:
Evan Lovel - Electrical & Computer Engineering
Gavin Meyer - Electrical & Computer Engineering
Philip Richardson - Electrical & Computer Engineering
Brian Tucker - Electrical & Computer Engineering

Faculty Advisor(s): Michael Santora, Herbert Hess
Mentor(s): Feng Li

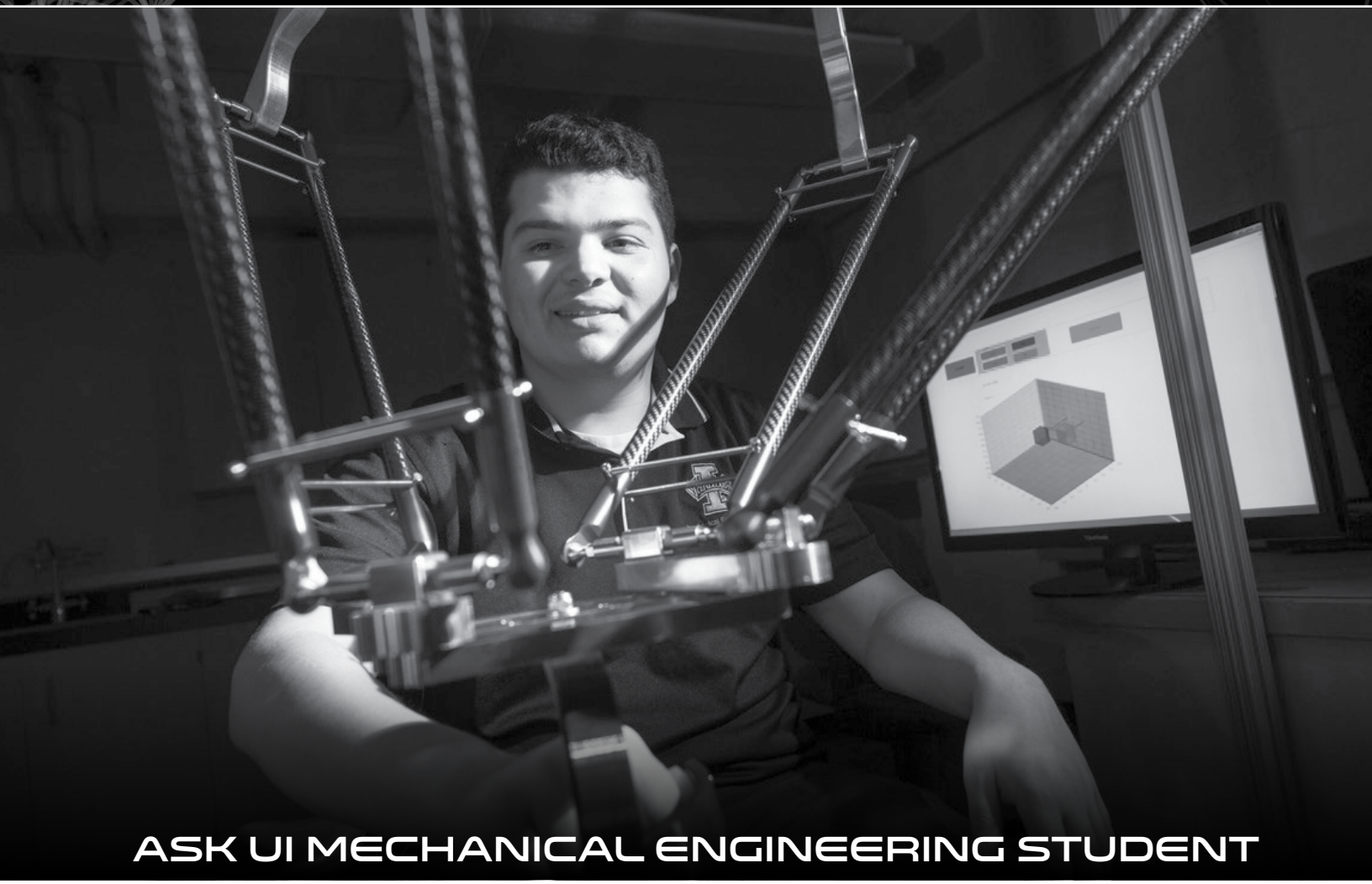
THE MANY FACES OF CIVIL ENGINEERING

Do you know what Civil Engineers do? Society would collapse without their work in everything from building bridges to making sure the water we drink is safe and tasty! Come by and meet students who are civil engineering majors at the University of Idaho!

Sponsor: Patricia Colberg
Sponsor Organization: UI Department of Civil Engineering
Team Members:
Regan Hansen - Civil Engineering

Faculty Advisor(s): Patricia Colberg
Mentor(s): Ahmed Ibrahim

WHERE WILL ENGINEERING TAKE YOU?



ASK UI MECHANICAL ENGINEERING STUDENT

STEPHEN GOODWIN

Stephen has been interested in robotics since he was a student at Coeur d'Alene High School. As an undergraduate at University of Idaho he was exposed to faculty research on finger and arm rehabilitation robotics. Now, as a graduate student Stephen is working on his own research to design medical robots to assist stroke patients. Stephen wants to develop new technologies rather than implement existing ones to help improve patients' quality of life and his University of Idaho mechanical engineering education has helped him get there.

LET US HELP YOU GET THERE!

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University of Idaho
College of Engineering

TOUCHSCREEN KIOSK

We are building an informational kiosk in the south entrance of the Janssen Engineering Building at the University of Idaho, using a projected wall-sized touchscreen.

Sponsor: Dean Larry Stauffer
Sponsor Organization: UI College of Engineering
Team Members:
Feng Guan - Computer Science
Morgan Holbart - Computer Science
Robin Rakowski - Computer Science
Ronald Rodriguez - Computer Science

Faculty Advisor(s): Bruce Bolden

UNIVERSITY OF IDAHO CLEAN SNOWMOBILE CHALLENGE TEAM

The technologies that the CSC team develops are to improve fuel efficiency, emissions, make a quieter snowmobile, while creating over 100 horsepower.

Sponsor: UI College of Engineering
Sponsor Organization: SAE International Clean Snowmobile Challenge
Team Members:
Daniel Aguilera - Mechanical Engineering
Jeffery Black - Mechanical Engineering
Jeffery Craig - Electrical & Computer Engineering
Ben DeRuwe - Mechanical Engineering
Aaron Eliason - Mechanical Engineering
Megh Hester - Mechanical Engineering
Bryce Jensen - Mechanical Engineering
Emily Kliewer - Mechanical Engineering
Zack Lipple - Mechanical Engineering
Jason Maas - Mechanical Engineering
Leland Maris - Mechanical Engineering
Justin Ruehl - Mechanical Engineering
Dillon Savage - Mechanical Engineering
Stephen Schoomen - Mechanical Engineering
Adam Sedgwick - Mechanical Engineering
Cade Smith - Mechanical Engineering
Chase Smith - Mechanical Engineering
Ian Sullivan - Mechanical Engineering
Mark Woodland - Mechanical Engineering
Alex Wright - Mechanical Engineering
Makynzie Zimmer - Mechanical Engineering

Faculty Advisor(s): Dan Cordon

UNIVERSITY OF IDAHO FORMULA HYBRID RACE CAR TEAM

The University of Idaho Formula Hybrid Team is comprised of both undergraduate and graduate students. We design, manufacture, and test a formula hybrid race car to compete in the international Formula Hybrid competition. The object of this competition is to create the fastest, most efficient, and most reliable race car.

Sponsor: UI College of Engineering
Sponsor Organization: SAE International Formula Hybrid
Team Members:
Joel Aguilera - Mechanical Engineering
Deryk Ahner - Mechanical Engineering
David Arnett - Electrical & Computer Engineering
Nicholas Bachus - Mechanical Engineering
Chris Baker - Mechanical Engineering
Brandon Hilliard - Mechanical Engineering
Jared Kellerer - Mechanical Engineering
Pat Lutskas - Mechanical Engineering
Monte McKinn - Electrical & Computer Engineering
Dan Mikkelson - Mechanical Engineering
Steven Nieuwenhuis - Mechanical Engineering
Joel Ratcliffe - Electrical & Computer Engineering
Zachary Robertson - Mechanical Engineering
Bryan Tiniacos - Mechanical Engineering
Levi Vogel - Mechanical Engineering
James Wilson - Electrical & Computer Engineering

Faculty Advisor(s): Steven Beyerlein, Dan Cordon, Edwin Odom, Russ Porter, Michael Santora
Mentor(s): Jake Gilles, Justin Pettingill

UNIVERSITY OF IDAHO INDUSTRIAL ASSESSMENT CENTER

The IAC team conducts energy audits for small and medium manufactures at no cost, identifying opportunities to improve productivity, reduce waste, and save energy. The booth and presentation this year focus on a lighting transition case study. Come see the effects of light and energy!

Sponsor:
Sponsor Organization: U.S. Department of Energy
Team Members:
Jesse Caudle - Mechanical Engineering
Chad Dunkel - Biological Engineering
Brian Hanson - Biological Engineering
Gene Staggs - Biological Engineering
Jace Westcott - Mechanical Engineering

Faculty Advisor(s): Dev Shrestha

USING MAGNETIC NANOPARTICLES TO CLEAN ACIDIC MINE DRAINAGE WATER

Acidic drainage from abandoned mines can be harmful to the environment and toxic to life. Systems currently used to treat the drainage can be overwhelmed by seasonal increases from snow melt. This system will use plates coated with magnetic nanoparticles to adsorb iron and other contaminants near the source, providing a buffer to primary treatment systems.

Sponsor: James Moberly
Sponsor Organization: UI Department of Chemical & Materials Engineering
Team Members:
Faisal Alhajri - Chemical & Materials Engineering
Zachary Branter - Chemical & Materials Engineering
Jacob Kline - Chemical & Materials Engineering

Faculty Advisor(s): James Moberly, Jeff Langman, David Drown

WEB BASED SECURITY HARDENING GUIDES

A cloud based repository of multi-platform security guides for non-technical users. The project is self-contained: anyone can create their own instance of the system.

Sponsor: Daniel Conte de Leon
Sponsor Organization: UI Department of Computer Science
Team Members:
Casey Blair - Computer Science
Christopher Goes - Computer Science
Antonius Stalick - Computer Science

Faculty Advisor(s): Bruce Bolden
Mentor(s): Keith Drew

WORLD RECORD PARTY WHEEL

We created a 6-foot diameter spinning machine that is capable of displaying LED images from across the Kibbie Dome Stadium. This world record breaking machine will be used by the Idaho marching band to enrich the vandal game day experience.

Sponsor: Robert Rinker
Sponsor Organization: UI Department of Computer Science
Team Members:
Austin Olsby - Mechanical Engineering
Nathan McLeod - Mechanical Engineering
Tyler Wittreich - Computer Science
Zachary Yama - Computer Science

Faculty Advisor(s): Dan Cordon, Bruce Boldin

WHERE WILL ENGINEERING TAKE YOU?

HOW ABOUT TO THE NEW HAMPSHIRE MOTOR SPEEDWAY

to compete in the annual SAE International Formula Hybrid race car competition. Founded and run by the Thayer School of Engineering at Dartmouth the Formula Hybrid event is regarded as the most complex and dynamic collegiate design challenge. Vandal Racing has competed in New Hampshire since 2011, bringing home top awards from General Motors and Chrysler and winning the event in 2014.

HELP OUR UI ENGINEERS GET THERE

Competing with the nation's top universities in the Formula Hybrid event requires our students to innovate across mechanical, electrical, and computer engineering disciplines. But sustaining a SAE International collegiate design series formula hybrid team is expensive. Consider a gift of any size to help provide our engineers with this unparalleled hands-on experience.

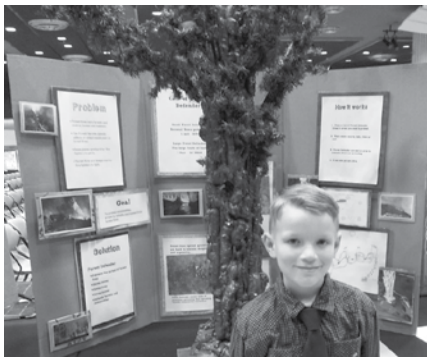
Contact our Engineering Development team today!

208-885-5201 or engr-development@uidaho.edu | uidaho.edu/engr/give

EXPO Welcomes Invent Idaho Student Finalists

Invent Idaho is a program conceived in 1989 for students in grades 1-12 to provide a forum for thousands of young inventors. Invent Idaho is the only program of its kind in Idaho. Young inventors participate in progressive levels of competitions, including three regional events held across Idaho, culminating in an Invent Idaho State Finals event. This year's finals took place on the University of Idaho Moscow campus. For more information about Invent Idaho visit www.inventidaho.com.

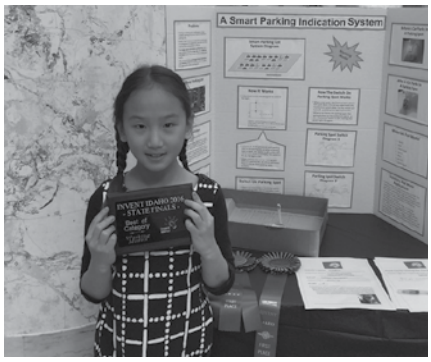
College of Engineering Dean Larry Stauffer has invited the 2016 Invent Idaho finalists to participate in this year's UI Engineering Design EXPO in recognition of their accomplishments.



FOREST DEFENDER
Zane Laker
2nd Grade

Ramsey Elementary, Coeur d'Alene

Forest Defender is a system designed to protect forests, homes and communities from devastating wildfires. An irrigation system built to make a wall of protection while seamlessly blending into the forest disguised at native trees.



A SMART PARKING INDICATION SYSTEM
Elena Li
4th Grade

Collister Elementary, Boise

A Smart Parking Indication System can guide a driver to find a parking spot easily in an open and busy parking lot, which will save fuel, reduces car emissions and dangers to pedestrians. The system is a low cost solution and easy to be implemented on an existing parking lot such as Costco and Walmart etc.

THE NO PRESSURE BALLET BAR
Sydney Blood
6th Grade

Monroe Elementary, Boise

The No Pressure Ballet Bar detects pressure placed on ballet bar and glows when there is too much pressure. It works as an aide to teach proper muscle control in ballet/barre practice.

LIGHTEN UP
Owen Forsman
4th Grade

Garwood Elementary, Rathdrum

Lighten Up is an invention that clips into a lampshade and allows the lamp to power itself by using its own light as an energy source.

SAY IT AND PLAY IT
Josiah Wenner
4th Grade

Pioneer School of the Arts, Boise

The Say It and Play It game is intended to help visual spatial learners learn musical notes through fun, Crayola-created playing characters and playing cards. Often, young students of music are turned off by regular flash cards, but learning music is essential for all students in helping the brain develop.

HEALING OUR VETERANS
Mia O'Hara
9th Grade

North Idaho STEM Charter, Rathdrum

Healing Our Veterans is an adaptation of current technology, using the concepts of neuroscience, to create a low cost, easily available, private and simple tool to assist veterans with PTSD.

WHERE WILL ENGINEERING TAKE YOU?

Sponsored by: University of Idaho College of Engineering | swe

HOW ABOUT TO WOMEN IN ENGINEERING DAY

a fun filled free one-day workshop at the University of Idaho for female high school students, grades 11-12. Women in Engineering Day (WIE) is designed to introduce post-secondary education and careers in engineering and computer science. The workshop provides the opportunity for participants to explore future career possibilities through hands-on activities, exposure to current engineering students, faculty, and professionals, as well as interaction with specific engineering disciplines.

WIE 2016 will be held October 28, 2016.

PARTICIPANTS WILL HAVE THE OPPORTUNITY TO:

EARN a scholarship toward your undergraduate degree in engineering

LEARN about the diversity of careers in engineering

INTERACT with current students, faculty and industry professionals

STAY overnight with college women in a dorm (optional)

TOUR College of Engineering labs and facilities

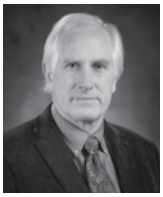
PARTICIPATE in hands-on engineering design activities

For information and to register visit: uidaho.edu/wie

2016 EXPO ORGANIZING AND DEVELOPMENT TEAM

LARRY STAUFFER
Dean

JOE LAW
Associate Dean for Undergraduates



ROB PATTON
Marketing Communications Manager

MATTHEW RILEY
Mechanical Engineering Faculty & Capstone Adviser

MARIA PREGITZER
Director of Student Services

TANYA GALE
Dean's Office Administrative Coordinator

AMY KERST
Student Services Programs Coordinator

ERIN BUURKARL
Civil Engineering Department Manager

SANDY SPEAR
Alumni and Donor Relations Coordinator

STACY RAUCH
Development Coordinator

CHRISTINA RANDAL
Director of Development

MARY LEE RYBA
Assistant Dean for Development

Planning Engineering Design EXPO is a yearlong activity. To explore future opportunities to support the University of Idaho's Engineering Design EXPO contact the College of Engineering Development team at 208-885-5201 or email us at expo@uidaho.edu. We look forward to talking with you about how you can help support EXPO and our current and future students.

Special thanks to University Communications and Marketing, Katie Chaffins and the Creative Services unit for their invaluable assistance with creating Engineering Design EXPO promotional content and event materials.

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