ENGINEERING DESIGN EXPO

XXV

Celebrating the next 25 years in engineering and what it means to Engineer Like a Vandal

APRIL 27, 2018

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 2018 Engineering Design EXPO and the University of Idaho College of Engineering.
WELCOME TO ENGINEERING DESIGN EXPO
Celebrating the Next 25 Years in Engineering and what it Means to Engineer Like a Vandal

It is my pleasure to welcome you to the 25th Annual Engineering Design EXPO, Idaho’s longest-running exposition showcasing senior engineering capstone projects. For more than 100 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 students’ innovation for twenty-five years. Every year we make an effort to not only showcase our students but to do something different that demonstrates the importance of engineering to our world. This year we are focused on celebrating the next 25 years in engineering. Because over the next 25 years our current and incoming students will make the most of their education and a difference in the world.

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 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 and partners that support EXPO activities from our K-16 Extended Experience program to providing meals for our judges and capstone students. Thank you to Avista, the Boeing Company, BP, CCI-Speer, the Center for Advanced Energy Studies, HP, Idaho National Laboratories, Idaho Power, Idaho STEM Action Center, J-U-B Engineers, Lochsa Engineering, Power Engineers, Schweitzer Engineering Laboratories, Wagstaff and Western Trailers.

We are proud of the educational experience our students receive. As you visit EXPO please engage with our students and ask them about their projects and engineering designs, the future they hope to create and what it means to them to Engineer Like a Vandal.

Finally, I want to thank all of our faculty, staff, students, judges and industry and academic partners who have helped shape EXPO over the past two and a half decades. We look forward to celebrating the next 25 years of EXPO with you!

Sincerely,

Larry Stauffer, Dean
University of Idaho, College of Engineering
THANK YOU

2018 ENGINEERING DESIGN EXPO SPONSORS AND PARTNERS

The University of Idaho, College of Engineering thanks all of our sponsors and partners for their generous support of the 25th annual Engineering Design EXPO. We value and appreciate your participation and continued commitment to engineering education and EXPO.

Corporate Presenting Sponsor  Academic Presenting Sponsor

Event Sponsors

Event Partners

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 expo@uidaho.edu. We look forward to talking with you about how you can help support EXPO and our current and future students.
SCHEDULE

EXPO INFORMATION
1st Floor
7 a.m. - 2:30 p.m.

PROJECT PRESENTER REGISTRATION AND SETUP
2nd Floor, International Ballroom
7:00 a.m. - 8:30 a.m.

JUDGE REGISTRATION, BREAKFAST AND ORIENTATION
2nd Floor, Vandal Ballroom
7 a.m. - 8:45 a.m.

EXTENDED EXPERIENCE GROUP CHECK-IN
1st Floor
8 a.m. - 10:30 a.m.

OPENING CEREMONY
2nd Floor, Chiefs Lounge Area
8:45 a.m. - 9 a.m.

EXPO HALL OPEN
2nd Floor, International Ballroom
9 a.m. - 3:30 p.m.

TECHNICAL PRESENTATIONS
2nd Floor, Vandal Ballroom, Silver, Gold & Chiefs Rooms; Basement level, Cataldo Room
9 a.m. - 12 noon

MOVIE: DREAM BIG: Engineering Our World
2nd Floor, Borah Theater
9:00 a.m., 10:00 a.m., 11:00 a.m., 12:00 p.m., 2:00 p.m.

FUTURE ENGINEER TALK: ALEX KNOLL
The Things We Can Do
2nd Floor, Borah Theater
1 p.m. - 1:30 p.m.

KEYNOTE TALK: BURT RUTAN
Managing and Motivating the Creative Process
2nd Floor, Vandal Ballroom
2:30 p.m. - 3:30 p.m.

EXPO CLOSING CEREMONY
2nd Floor, Vandal Ballroom
3:30 - 4 p.m.
Technical presentations are approximately 20 minutes and will take place in multiple locations in the Bruce M. Pitman Center between 9 a.m. and 12 noon. (Chief’s Room, Vandal Ballroom, Silver Room, Gold Room and Cataldo Room).

### Gold Room
*(2nd floor - Bruce M. Pitman Center)*

- **9:00 am** Application for Speech Visualization
- **9:20 am** Modeling and Measurement of Permittivity for Near Space Communications
- **9:40 am** Advanced Communications System for Suborbital Flight
- **10:00 am** TATER (Tamper Analysis via Transient Electromagnetic Responses)
- **10:20 am** Break
- **10:40 am** Mitigating Cyberattacks Caused by Fast Acting Hardware
- **11:00 am** Solar Powered Flywheel Energy Storage System
- **11:20 am** Voltage Source Converter Fault Protection
- **11:40 am** Non-Wire Solutions to Traditional Power Grid Upgrades

### Silver Room
*(2nd floor - Bruce M. Pitman Center)*

- **9:00 am** Boeing Sidewall Lighting Installation
- **9:20 am** Coffee Roaster Filtration System
- **9:40 am** SEL Thermal Card Guide
- **10:00 am** An Aerodynamic Study of Bulk Commodity Trailers
- **10:20 am** Break
- **10:40 am** Combat Food Insecurity
- **11:00 am** Portable Biodiesel
- **11:20 am** UI Steam Plant Combustion Instrumentation
- **11:40 am** Two-Stroke Exhaust Design
- **12:00 am** Clean Snowmobile Challenge

### Chiefs Room
*(2nd floor - Bruce M. Pitman Center)*

- **9:00 am** Inconel Tubing Pre-Pullout Grinding and Visual Test System
- **9:20 am** INL Grinder Water Filtration System
- **9:40 am** Wireless Forklift Height Encoder
- **10:00 am** Compact Robotic Wheel Drive
- **10:20 am** Break
- **10:40 am** VandalForge Metal Additive Manufacturing Hardware
- **11:00 am** VandalForge Printer Software
- **1:20 am** Combined Biochar, Heat, and Power System
- **11:40 am** Team Crumbletech’s Temperature Array
- **12:00 pm** Photo-bioreactor for Microalgae Cultivation.

### Cataldo Room
*(Basement level - Bruce M. Pitman Center)*

- **9:00 am** 99.9 Percent High Purity Nitrogen Generator
- **9:20 am** Increasing Polystyrene Recycling with Small Scale Depolymerization Reactors
- **9:40 am** Copper Recovery from Spent Hoof bath Solutions
- **10:00 am** Production of Liquid Filled Polymer Microspheres
- **10:20 am** Break
- **10:40 am** Gypsos Sulfate Removal from Mine-Impacted Waters
- **11:00 am** Using NIR Spectroscopy to Control Coffee Roasts
- **11:20 am** LABRAT, Lead Acid Battery Research And Testing
- **11:40 am** Bench Top to Industry: Ultra-High Temperature (UHT) Starch Pasteurization Unit
THANK YOU

2018 Engineering Design EXPO Judges

Thank you to all of the individuals who have taken time to lend their expertise to serve as Engineering Design EXPO judges. Judges play an essential role in the EXPO experience. Our students gain invaluable insights through their interaction with EXPO judges. To all of our 2018 EXPO judges, thank you for joining us on the 25th anniversary of EXPO, your participation is greatly appreciated. We hope to see you again next year.

Shankar Achanta - Schweitzer Engineering Laboratories
Edward Anderson - Battelle Energy Alliance
Phillip Arpke - Wagstaff, Inc.
Peter Baran - Design Magnitude Idaho
Ralph Barker - Retired
Amanda Battles - Clearwater Paper
Taylor Blanc - Schweitzer Engineering Laboratories
Pat Blount - Moscow High School
Pietro Boyd - Nightforce Optics
Mary Ellen Brewick - University of Idaho
Garry Brown - Idaho National Laboratory
Kris Brown - Self-Employed
Ed Cimbalik - Micron
Jay Clark - Motorola Solutions, Inc.
Jeffrey Daniels - Acoustic Research Detachment - NSWCCD
Jason Dearien - Schweitzer Engineering Laboratories
Sharon Eroschenko - U.S. Bureau of Reclamation
Byron Flynn - General Electric
Stephen Goodwin - Schweitzer Engineering Laboratories
Yvonne Hallock - Retired
Robert Hallock - Retired
Chris Hazelton - Coffman Engineers Inc.
David Hollenback - BERG Manufacturing
Howard Hooper - HP Inc.
Paul Huber - The Boeing Company
Christopher Hyde - University of Idaho
Mark Ingram - Micron
Richard Jacobsen - Idaho State University
Dave Joerger - Idaho Power Company
Krista Kinsey - J.R. Simplot Company
Jacob Leachman - Washington State University
Brent Lee - Schweitzer Engineering Laboratories
Amy Lienitz - Idaho National Laboratory Richard
Maguire - Avista Utilities
Ken Mays - College Advisory Board Member
Thomas Moore - Self-Employed
Caitlin Owsley - Janicki Industries
Lyle Parks - Retired
Marc Patterson - Idaho Power Company
Tom Pfeiffer - Idaho National Laboratory
Shawn Pratt - HP Inc.
Behnaz Rezaie - University of Idaho
Jonathan Richards - Schweitzer Engineering Laboratories
Kurt Ririe - Idaho National Laboratory
Pete Robichaud - USDA Forest Service, Rocky Mt. Research Station
Anne Seifert - Idaho National Laboratory
Adam Seubert - Schweitzer Engineering Laboratories
Steve Silkworth - Avista Corp
Alex Simon - The Boeing Company
Mark Sipe - Coffman Engineers, Inc.
Howard Skidmore - JR Simplot Company
Jamison Slippy - Quest Aircraft Company
Sean Stadelman - Schweitzer Engineering Laboratories
Ed Whitehead - Retired
Min Xian - University of Idaho
From the Academy Award® Nominated Producers of Everest and The Living Sea

MacGillivray Freeman’s

DREAM BIG

ENGINEERING OUR WORLD

A HEARTFELT STORY OF HUMAN INGENUITY

Narrated by JEFF BRIDGES

A MACGILLIVRAY FREEMAN FILM “DREAM BIG” PRODUCED IN PARTNERSHIP WITH AMERICAN SOCIETY OF CIVIL ENGINEERS® PRESENTED BY BECHTEL CORPORATION

(x) JEFF BRIDGES (x) JOHN JENNINGS BOYD (x) P JASON, PAUL, STEPHEN JUDSON, MARK FLETCHER (x) SHAUN MACGILLIVRAY (x) GREG MACGILLIVRAY

DreamBigFilm.com

BORAH THEATER - EXPO SHOWTIMES:

9:00 a.m. | 10:00 a.m. | 11:00 a.m. | 12:00 p.m. | 2:00 p.m.
Women in Engineering Exploratorium
Exploring Engineering at the University of Idaho

A new event held April 26-27, 2018 in conjunction with the 25th annual Engineering Design EXPO and in partnership with the U of I Society of Women Engineers.

The Exploratorium is an event designed for 9th and 10th grade girls who want to learn more about the STEM disciplines and consider engineering in college. The Exploratorium will provide hands-on activities, exposure to the engineering disciplines and unique U of I Engineering programs and interaction with female engineering students and alumni.

Exploratorium participants will receive a unique opportunity to hear from Sanjay Mehrotra, CEO of Micron, who has agreed to speak directly to participants on the importance of our future engineering workforce.

Building an inclusive, diverse community is a goal of the University of Idaho, College of Engineering. The college hopes to triple the number of female students by 2025. To assist in that objective the college holds a series of women in engineering events, like the Exploratorium, to inspire young women to pursue engineering.

Learn more about Women in Engineering activities hosted by the College of Engineering

UIDAHO.EDU/WIE
It means being committed to providing opportunities to grow the profession

U of I’s student-led Society of Women Engineers wants to bust national trends of women holding fewer senior level positions and leaving the engineering field at higher rates than men.

They want to be role models for high school students who can’t name a single female engineer.

Each year, they strive to draw more young women into the field through a day of hands-on, real-life engineering challenges. Like building a water filtration system from plastic bottles and paper towels. They hope the creations will be the beginning stages of the next generation of engineers.

uidaho.edu/busting-trends

“I think it’s really important to show these young women that even though there’s not too many of us, we’re in this together and we’re going to help them get better. I really want them to be inspired to push themselves to be ambitious.”

Emily Kaschmitter
Biological Engineering Major
THE THINGS WE CAN DO

April 27, 2018  |  1:00-1:30 p.m.

Borah Theater, Second Floor, Bruce M. Pitman Center

13-year-old app developer, Alexander Knoll, will discuss his journey developing Ability App and talk about the things we can do, big and small, to make the world a more inclusive and accessible place.

About Alex Knoll

Alexander Knoll is a 13-year-old app inventor, human rights advocate and international speaker from Post Falls, Idaho. Knoll has a big heart and has always been drawn to helping others.

Knoll has accomplished a great deal in his short life, thus far. At Age 8, he testified in front of the Idaho State Legislature Tax and Revenue Committee, on behalf of the school children of Idaho. At Age 10, he became the Regional and State Grand Champion of Invent Idaho (a statewide competition for young inventors) for his app invention that can help people with disabilities navigate public spaces and find safe, reliable services and employment called Ability App.

Learn more about Alex Knoll at www.AbilityApp.org
MANAGING AND MOTIVATING THE CREATIVE PROCESS

April 27, 2018  |  2:30-3:30 p.m.
Vandal Ballroom, Second Floor, Bruce M. Pitman Center

About Burt Rutan

Named “Entrepreneur of the Year” by Inc. Magazine and described by Newsweek as “the man responsible for more innovations in modern aviation than any living engineer,” Burt Rutan is a bold entrepreneur and designer with the vision and passion for the advancement of technology.

Rutan is designer of Voyager, the first plane to fly around the world without stopping or refueling. He is also designer of SpaceShipOne, the world’s first privately-built manned spacecraft to reach space. His company SCALED Composites has developed and tested a variety of groundbreaking projects, from military aircraft to executive jets, showcasing some of the most innovative and energy-efficient designs ever flown. Rutan will give his EXPO keynote on the topic of managing and motivating the creative process.  Learn more about Burt Rutan at www.burtrutan.com
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About the College of Engineering Senior Capstone Program

The University of Idaho’s College of Engineering 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 is Idaho’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.

2018 EXPO Project Advisers

BIOLOGICAL ENGINEERING
• Dev Shrestha

CHEMICAL AND MATERIALS ENGINEERING
• Matthew Bernards
• David Drown

CIVIL AND ENVIRONMENTAL ENGINEERING
• Erik Coats
• Charles Cornwall
• Fritz Fiedler
• David MacPherson

• Batric Pesic
• J.J. Petersen
• Sunil Sharma

COMPUTER SCIENCE
• Bruce Bolden

ELECTRICAL AND COMPUTER ENGINEERING
• Yacine Chakhchoukh
• Herbert Hess
• Saied Hemati
• Brian Johnson
• Feng Li
• Ata Zadehgol

MECHANICAL ENGINEERING
• Coleton Bailey
• Steve Beyerlein
• Dan Cordon
• John Crepeau
• Ankit Gupta
• Gautam Kumar
• Michael Maughan
• Edwin Odom
• Joel Perry
• Behnaz Rezaie
• Daniel Robertson
• Matthew Swenson
• Tao Xing
Congratulations to our Graduating Seniors

We congratulate you on a job well done and we wish you the best in your future. We also look forward to the contributions you will make to engineering over the next 25 years.

Khalid Aldossari - Electrical Engineering
Brian Aldrimk - Mechanical Engineering
Hussain Aljasm - Chemical Engineering
Abdullah Abdulaziz Alnasifah - Chemical Engineering
Abdulaliz Alothabi - Chemical Engineering
Yazeed Alothabi - Electrical Engineering
Barjas Alruwaili - Electrical Engineering
Rafael Akio Alves Watanabe - Electrical Engineering
Austin Anderson - Mechanical Engineering
Simon Barnes - Computer Engineering
Cody Barrick - Civil Engineering
Emma Bateman - Computer Science
Jacob Bechler - Computer Engineering
Lucas Becia - Biological Engineering
Adrian Beehner - Computer Science
Doy Bilbrey - Civil Engineering
Zachary Bjorklund - Computer Engineering
Andrew Blanchard - Civil Engineering
Byron Bowles - Mechanical Engineering
Robert Brockenridge - Computer Science
Jonathan Buch - Computer Science
Mariana Burdellis - Computer Engineering
Tywan Buser - Mechanical Engineering
Ry Butler - Civil Engineering
Dylan Carlson - Computer Science
Maichen Carnes - Chemical Engineering
Gregory Carter - Computer Science
Xi Chen - Biological Engineering
Tianyi Chen - Electrical Engineering
Timothy Clemans - Computer Science
Jonathan Counts - Chemical Engineering
Matthew Covalt - Chemical Engineering
Daniel Cox - Mechanical Engineering
Jeffrey Craig - Electrical Engineering
Lucas Cressler - Civil Engineering
Hector Cruz - Electrical Engineering
Sean Daniel - Electrical Engineering
Fiffan Deng - Electrical Engineering
Matthew Diekmann - Mechanical Engineering
Mao Ding - Electrical Engineering
Marc Dobson - Mechanical Engineering
Melissa Dow - Electrical Engineering
Phoenix Duncan - Mechanical Engineering
Alexandra Edwards - Mechanical Engineering
Neale Ellyson - Chemical Engineering
Lydia Enderbrett - Computer Science
Drew Fagan - Mechanical Engineering
Zachary Farman - Civil Engineering
Peter Fetros - Computer Engineering
Peter Fetros - Computer Science
Nicholas Flynn - Electrical Engineering
Seth Forrest - Mechanical Engineering
Dustin Fox - Computer Science
Jesse Franzich - Computer Science
John Gergen - Mechanical Engineering
Gabriel Gibler - Computer Science
Gretchen Gingerich - Biological Engineering
Marco Godinez - Civil Engineering
Kylie Gonzalez - Biological Engineering
Zachary Hacker - Mechanical Engineering
Jade Hall - Mechanical Engineering
Brett Harnew - Electrical Engineering
Matthew Harnew - Mechanical Engineering
Colter Hathaway - Civil Engineering
Spencer Hauck - Mechanical Engineering
Nigel Hobbeln - Chemical Engineering
Daniel Hein - Mechanical Engineering
Meghann Hester - Mechanical Engineering
Brandon Hilliard - Mechanical Engineering
Aaron Hope - Chemical Engineering
Anchong Hou - Electrical Engineering
Cortney Hudson - Electrical Engineering
Matthew Jungert - Biological Engineering
Jerry Kahn - Mechanical Engineering
Sean Kelly - Civil Engineering
Leif Krapas - Chemical Engineering
Yue Li - Electrical Engineering
Jiawei Liu - Electrical Engineering
Jason Maas - Mechanical Engineering
Collin Mabe - Mechanical Engineering
Michael Madsen - Computer Science
Dustin Mallett - Electrical Engineering
Lillian Malloy - Chemical Engineering
Andrea Mansfeld - Chemical Engineering
Katherine Mares - Civil Engineering
Paul Martin - Computer Science
Ryan May - Electrical Engineering
Sheila McAtee - Civil Engineering
Benjamin Meerritt - Computer Science
Michael Meyer - Mechanical Engineering
Jacob Middleton - Mechanical Engineering
Kevin Miklos - Mechanical Engineering
Kyle Mills - Civil Engineering
Forrest Miller - Electrical Engineering
Jacob Miller - Mechanical Engineering
Thomas Moore - Mechanical Engineering
Cameron Moore - Mechanical Engineering
Bradley Morris - Mechanical Engineering
Brett Morris - Mechanical Engineering
Trevor Morse - Computer Science
Stafford-Ames Morse - Mechanical Engineering
Amanda Murdock - Chemical Engineering
Cameron Murdock - Electrical Engineering
Nathan Myers - Chemical Engineering
Adam Nienet - Mechanical Engineering
Thomas Nichman - Electrical Engineering
Sam Nordquist - Chemical Engineering
Alex Nutman - Civil Engineering
Adam O’Keeffe - Biological Engineering
Bryan Ortiz - Electrical Engineering
Michael Ottman - Mechanical Engineering
William Overstreet - Mechanical Engineering
Andrew Owens - Electrical Engineering
Nathan Park - Mechanical Engineering
Brian Patterson - Electrical Engineering
Patrick Paulus - Mechanical Engineering
Hannah Pearson - Computer Science
Joseph Pengilly - Chemical Engineering
Samantha Peters - Biological Engineering
Logan Peterson - Chemical Engineering
Eric Willace Pitman - Electrical Engineering
Benjamin VanSant - Mechanical Engineering
Trang Vu - Chemical Engineering
Phillip Walters - Chemical Engineering
Matthew Waltz - Computer Engineering
Haotian Wang - Electrical Engineering
Joshua Warnick - Mechanical Engineering
Lise Welch - Computer Science
Michael Wendick - Mechanical Engineering
Alexander Wezensky - Computer Science
Erin Wholess - Chemical Engineering
Nathaniel Wiedenmeyer - Mechanical Engineering
Jack Williams - Chemical Engineering
Dakota Wilson - Civil Engineering
Mingyang Xu - Electrical Engineering
Wang Xu - Electrical Engineering
Qinlin Xu - Electrical Engineering
James Young - Computer Science
Yue Yu - Electrical Engineering
Huijie Zhou - Chemical Engineering
Zhiyan Zhou - Electrical Engineering

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XXV | Engineering EXPO 2018
The Grand Challenge Scholars Program

Now in its second year the University of Idaho’s Engineering Grand Challenge Scholars Program is the only undergraduate program in Idaho established to educate a new generation of engineers expressly equipped to tackle the most pressing issues facing society in the 21st century.

U of I Grand Challenge Scholars presenting at the 25th annual Engineering Design EXPO.

Mark Currier
Materials Science Engineering
Snohomish, Washington

Photolithographic techniques for semiconductors
This research project will explore the possibilities of patterning nanoparticles of a tin selenide semiconductor. The impacts of the research will span many applications and contribute to an ever-growing need for semiconductor research.

Allison Ellingson
Electrical Engineering
Boise, Idaho

Improving Tissue Preparation to Preserve Inhibition in Adult Cerebellar Brain Slices
To study how neurons work together, it is necessary to isolate pieces of brain tissue in a way that preserves connectivity and function. This project endeavors to identify optimal tissue preparation procedures to improve the viability and function of neurons in the cerebellum to study this network.

Steven Haener
Mechanical Engineering
Boise, Idaho

Making Stronger Wheat
The main focus of this project is to build a machine that can measure how much force a stalk of wheat can take before breaking. The design that we decided would work best is a rolling trailer with a force sensor fastened to the front.

Anson Lunstrum
Mechanical Engineering
Nampa, Idaho

3D Printed Eye Phantom for Astronaut MRI study
Nearly half of all astronauts who have experienced long duration space flight have suffered severe eye damage. Using Magnetic resonance (MR) images of a group of astronauts, these visual changes can be quantified, and an optic phantom is necessary to validate the MR data coming from multiple sources.

Jackie Martinez-Alvarez
Chemical Engineering and Chemistry
Milton Freewater, Oregon

Emotiv Game Development
Students in Moscow High School’s computer science class are partnering with Martinez-Alvarez and professor of chemical and materials engineering Gautam Kumar to develop a game based application for an Emotiv mobile EEG device.

Dustin Pierce
Biological Engineering and Computer Science
Sandpoint, Idaho

Mesenchymal Stem Cell Delivery of Carbon Nanotubes
This project shows the migration of carbon nanotube (CNT) and human mesenchymal stem cell (hMSC) complexes toward a tumor mimicking chemo-attractant. The CNT-hMSCs were previously attached as a master’s thesis. This study also shows the intermediate carbon nanotube complexes through FT-IR. Carbon nanotubes have potential in photothermal therapy.

Kenny Sheffler
Electrical Engineering
Potlatch, Idaho

Biogas Feasibility Study for the University of Idaho and the City of Moscow
Biogas production feasibility was determined from using the University of Idaho and the City of Moscow’s organic wastes as a source of energy. Biogas production estimation and an economic analysis was conducted. This renewable energy has great relevance to campus sustainability.

Bishal Thapa
Biological Engineering
Jharuwarashi, Nepal

Nitrofertilizer Pump
This project focuses on the production of nitrate and nitrite using non-thermal liquid plasma technology (NTLP) and investigation in its efficiency and development of models to demonstrate nitrogen cycle with emphasis on nitrogen fixation. The research aspect will focus on development of nitrogen fixation device using NTLP.
Every fall, the University of Idaho, College of Engineering recognizes a new class of inductees into its Academy of Engineers.

Members of the Academy of Engineers are individuals that have been selected for their personal contributions to engineering achievement, leadership, engineering education, and service to the profession and society.

We salute our Academy of Engineers leaders for their lifetime commitment to advancing the quality of life through achievement and innovation. Learn more at uidaho.edu/aoe

Class of 2017

James R. Arnold  
Mark L. Bathrick  
Candis S. Claiborn  
D. Mark Durcan

Byrant W. Lemon  
Thomas J. Mueller  
Yogendra N. Sarin  
Patrick R. Taylor
World-Class Technology, Made in the Northwest

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LAUNCH YOUR FUTURE WITH STEM

Plot a course to a STEMazing future with help from the Idaho STEM Action Center.

Through STEM competitions, internships, mentorships, and scholarships we can help you connect your education to industry and learn more about STEM career opportunities.

To find out how we can support your dreams, please visit stem.idaho.gov or like us on Facebook.
It means being committed to solving problems even in the remote wilderness

Herb Hess was summoned to bring electricity to U of I’s most remote research facility — in the 2.4 million-acre Frank Church-River of No Return Wilderness — with the purpose of increasing research on the area’s one-of-a-kind ecology.

He spent years installing renewable energy systems at Army bases in combat zones. Once exposed to Idaho’s pristine wilderness, though, he recognized the need to engineer clean energy systems to protect the environment.

To date, he and his students’ electrical systems have tripled research at the facility. They’re preserving the environment with their upgrades — all reliant on sun, wind and water — and they’re helping researchers safeguard the largest wilderness area in the lower 48.

uidaho.edu/remote-power

“What does it mean to ENGINEER LIKE A VANDAL?

“We have a completely renewable energy system out there and they’re able to conduct a wide range of research. Making as much progress in renewable energy is one of my goals as a professor. And with the attitudes that come out of places like the University of Idaho, we will succeed.”

Herbert Hess
Professor of Electrical and Computer Engineering
CIVIL AND ENVIRONMENTAL ENGINEERING

BEST HILL BOOSTER PUMP STATION
This purpose of this project is to design a booster pump station at the Best Hill Water Tank in Coeur d’Alene. The design will include booster pump selection, station design, and site grading.

TEAM
Morgen Dieckmann - Civil & Environmental Engineering
Marco Godinez - Civil & Environmental Engineering
Josh Graff - Civil & Environmental Engineering
Josh Krause - Civil & Environmental Engineering

CLIENT/SPONSOR
J-U-B Engineering, Inc.

TEAM
Morgen Dieckmann - Civil & Environmental Engineering
Marco Godinez - Civil & Environmental Engineering
Josh Graff - Civil & Environmental Engineering
Josh Krause - Civil & Environmental Engineering

CLIENT/SPONSOR
J-U-B Engineering, Inc.

MENTOR(S)
Erik Coats

COMMONWEALTH LAKE PARK PEDESTRIAN BRIDGE
Our project is to assess the site conditions at Commonwealth Lake Park in Beaverton, Oregon and to replace the existing pedestrian bridge with an ADA compliant pedestrian bridge.

TEAM
Justin Bilbrey - Civil & Environmental Engineering
Monica Erickson - Civil & Environmental Engineering
Zachary Farman - Civil & Environmental Engineering
Kyle Miley - Civil & Environmental Engineering

CLIENT/SPONSOR
3J Consulting

TEAM
Justin Bilbrey - Civil & Environmental Engineering
Monica Erickson - Civil & Environmental Engineering
Zachary Farman - Civil & Environmental Engineering
Kyle Miley - Civil & Environmental Engineering

CLIENT/SPONSOR
3J Consulting

MOSCOW WELL 10
Moscow Well 10 is a new, undeveloped well on the west side of town. For our project we will aid in well 10’s development by: selecting a pump for the well, designing a Process and Implementation Diagram (P&ID), and designing a storm water system.

TEAM
Gabe Housh - Civil & Environmental Engineering
Sheila McAtee - Civil & Environmental Engineering
Eric Weimer - Civil & Environmental Engineering

CLIENT/SPONSOR
J-U-B Engineering, Inc.

TEAM
Gabe Housh - Civil & Environmental Engineering
Sheila McAtee - Civil & Environmental Engineering
Eric Weimer - Civil & Environmental Engineering

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J-U-B Engineering, Inc.

RIO GRANDE DAM LOW LEVEL OUTLET WORKS
Due to excessive vibrations of the current gate flow control system during operations, the existing outlet is unable to meet its full discharge requirements. The objective of this project is to relocate and redesign the low level outlet to provide reliable operation up to 2,500 cfs. The new outlet system will consist of piping, valves, and a valve house downstream of the existing gates. In addition, a transition between

TEAM
Nathan Bernis - Civil & Environmental Engineering
Katie Dillon - Civil & Environmental Engineering
Alex Nuttman - Civil & Environmental Engineering
Dakota Wilson - Civil & Environmental Engineering

CLIENT/SPONSOR
Deere & Ault Consultants, Inc.

TEAM
Nathan Bernis - Civil & Environmental Engineering
Katie Dillon - Civil & Environmental Engineering
Alex Nuttman - Civil & Environmental Engineering
Dakota Wilson - Civil & Environmental Engineering

CLIENT/SPONSOR
Deere & Ault Consultants, Inc.

TILDEN SUBSTATION
Design and plan an electrical substation along with the required distribution and transmission lines to service an information data center in Reno, NV.

TEAM
Cody Barrick - Civil & Environmental Engineering
Lucas Cressler - Civil & Environmental Engineering
Lina Hassan - Civil & Environmental Engineering
Colter Hathaway - Civil & Environmental Engineering

CLIENT/SPONSOR
Power Engineers, Inc.

TEAM
Cody Barrick - Civil & Environmental Engineering
Lucas Cressler - Civil & Environmental Engineering
Lina Hassan - Civil & Environmental Engineering
Colter Hathaway - Civil & Environmental Engineering

CLIENT/SPONSOR
Power Engineers, Inc.

USTICK & LAKE INTERSECTION IMPROVEMENT
The City of Caldwell has planned to improve the intersection of Ustick Road and Lake Avenue in Caldwell, Idaho. The project objective is to design a larger capacity intersection to meet increasing traffic volume while improving traffic operations, safety, and accessibility.

TEAM
Andrew Blanchard - Civil & Environmental Engineering
Sean Kelly - Civil & Environmental Engineering
Daniel Logan - Civil & Environmental Engineering
Braiden Markham - Civil & Environmental Engineering

CLIENT/SPONSOR
Six Mile Engineering

TEAM
Andrew Blanchard - Civil & Environmental Engineering
Sean Kelly - Civil & Environmental Engineering
Daniel Logan - Civil & Environmental Engineering
Braiden Markham - Civil & Environmental Engineering

CLIENT/SPONSOR
Six Mile Engineering

WATER FOR FAMILIES “WHERE THERE IS NOTHING”
Students partner with a small Bolivian community to design and construct a sustainable freshwater distribution system. This project team is a part of the Humanitarian Engineering Corps, a student-led nonprofit based at the University of Idaho.

TEAM
Nick Broulliard - Civil & Environmental Engineering
Cat Feistner - Civil & Environmental Engineering
Kenny Sheffler - Electrical & Computer Engineering
Lindsey Smoot - Civil & Environmental Engineering
Chaney Wood - Civil & Environmental Engineering

CLIENT/SPONSOR
U of I Humanitarian Engineering Corps

TEAM
Nick Broulliard - Civil & Environmental Engineering
Cat Feistner - Civil & Environmental Engineering
Kenny Sheffler - Electrical & Computer Engineering
Lindsey Smoot - Civil & Environmental Engineering
Chaney Wood - Civil & Environmental Engineering

CLIENT/SPONSOR
U of I Humanitarian Engineering Corps

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Chaney Wood - Civil & Environmental Engineering

CLIENT/SPONSOR
U of I Humanitarian Engineering Corps

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Cat Feistner - Civil & Environmental Engineering
Kenny Sheffler - Electrical & Computer Engineering
Lindsey Smoot - Civil & Environmental Engineering
Chaney Wood - Civil & Environmental Engineering

CLIENT/SPONSOR
U of I Humanitarian Engineering Corps
CHEMICAL AND MATERIALS ENGINEERING

99.9% HIGH PURITY NITROGEN GENERATOR
The small-scale generation of nitrogen from atmospheric air utilizing a pressure swing adsorption approach will offer a stand-alone system that provides an inert sweep gas for a depolymerization process. The system will continuously produce high purity nitrogen while being reliable, versatile, and economical.

TEAM
Alen Korjenic - Chemical & Materials Engineering
Eric Pitman - Chemical & Materials Engineering
Sanjeet Shrestha - Chemical & Materials Engineering
Amanda Vu - Chemical & Materials Engineering

CLIENT/SPONSOR
KapStone

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
Wudneh Admassu
Dave MacPherson

BENCH TOP TO INDUSTRY: ULTRA-HIGH TEMPERATURE (UHT) STARCH PASTEURIZATION UNIT
Designed and fabricated a benchtop system to continuously pasteurize starch solutions at 150°C for 2 seconds. This system is able to pasteurize 1 liter per minute of sample and features an automated energy-saving pre-heat/cool down heat exchanger as well as the UHT heat exchanger.

TEAM
Leif Krapas - Chemical & Materials Engineering
Andrea Mansfeld - Chemical & Materials Engineering
Judah Stelck - Chemical & Materials Engineering
Minh Tran - Chemical & Materials Engineering

CLIENT/SPONSOR
Tate & Lyle PLC.

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
Charles Cornwall
Dave MacPherson

COPPER RECOVERY FROM SPENT HOOF BATH SOLUTIONS
Copper sulfate solutions used to treat hoof diseases in the livestock industry cost millions of dollars per year. It is desirable to find a cost-effective procedure for recovering copper, a valuable metal, from these solutions. The copper recovery process designed includes copper liberation from the biosolids matrix using an innovative oxidant system and copper ion recovery via electrowinning. This process provides an alternative disposal pathway for hoof bath solutions and recovery of a valuable metal resource.

TEAM
Abdulaziz Alotaibi - Chemical & Materials Engineering
Jonathan Counts - Chemical & Materials Engineering
E. Karl Haakenson - Chemical & Materials Engineering
Phillip Walters - Chemical & Materials Engineering

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U of I Department of Chemical & Materials Engineering

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
Charles Cornwall
Dave MacPherson
Batric Pesic

GYPSOS SULFATE REMOVAL FROM MINE-IMPACTED WATERS
An intricate process was designed and constructed to demonstrate an economical and environmentally friendly system that can reduce the sulfate concentration in mine-impacted water from around 1800 mg/L to less than 250 mg/L. Implementing this process in the mining industry would prevent sulfate from negatively affecting the environment.

TEAM
Abdullah Alnafisah - Chemical & Materials Engineering
Nigel Hebbeln - Chemical & Materials Engineering
Lillian Malloy - Chemical & Materials Engineering
Nathan Myers - Chemical & Materials Engineering
Sam Rasmussen - Chemical & Materials Engineering

CLIENT/SPONSOR
IEE/WERC Design Contest

ADVISOR(S)
Matthew Bernards

MENTOR(S)
David MacPherson

INCREASING POLYSTYRENE RECYCLING WITH SMALL SCALE DEPOLYMERIZATION REACTORS
Only six percent of plastic ever produced has been recycled. A problem with polystyrene recycling is its low density makes it not economically feasible to transport to recycling centers. A small scale depolymerization reactor which could be distributed widely throughout municipalities to increase recycling of polystyrene was fabricated and tested.

TEAM
Hussain Aljasim - Chemical & Materials Engineering
Maichen Carnes - Chemical & Materials Engineering
Preston Goodall - Chemical & Materials Engineering

CLIENT/SPONSOR
KapStone

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
Charles Cornwall
Connor Hill
Dave MacPherson
It means pioneering solutions that will change lives for the better

Achilles tendon tears in athletes can be career ending — and life changing for outdoor enthusiasts enjoying Idaho’s rugged wilds.

In hopes of finding a solution to those traumatic scenarios, Nate Schiele and his student research team are working to engineer tendon tissue through stem cell differentiation.

If successful, doctors could eventually extract stem cells from a patient, differentiate them toward tendon cells in the lab, place them on an engineered tissue scaffold, and suture them back into the patient. When that day comes, we could see the end to devastating tendon injuries.

uidaho.edu/building-a-better-tendon

“For people who have had major trauma, like an Achilles tendon rupture, we aim to replace or augment that injured tissue with a mechanically functional tendon replacement with cells that act like tendon cells.”

Nate Schiele
Assistant Professor of Biological Engineering
LABRAT, LEAD ACID BATTERY RESEARCH AND TESTING

Using GUITAR-coated ceramic fibers as the battery plate additive, the positive and negative active material was investigated and optimized. This data yielded a design and economic analysis for a facility capable of producing two million improved performing automotive batteries per year.

TEAM
Neale Ellyson - Chemical & Materials Engineering
Aaron Hope - Chemical & Materials Engineering
Thomas Thuneman - Chemical & Materials Engineering

CLIENT/SPONSOR
University of Idaho Office of Undergraduate Research

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
John Canning
Jared Wo

PRODUCTION OF LIQUID FILLED POLYMER MICROSHERES

A system to create liquid filled polymer microspheres utilizing a piezoelectric droplet generator and photopolymerization was fabricated. These microspheres are intended for use as drug delivery capsules, specifically for long term dosage of pharmaceuticals via diffusion through the polymer microsphere.

TEAM
Cortney Hudson - Chemical & Materials Engineering
Samuel Nordquist - Chemical & Materials Engineering
Keely Snow - Chemical & Materials Engineering
Erin Wheless - Chemical & Materials Engineering

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U of I Department of Chemical & Materials Engineering

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
John Canning
Jared Wo

USING NIR SPECTROSCOPY TO CONTROL COFFEE ROASTS

A person’s sensory perceptions judge coffee roast level is subjective, causing difficulties in comparisons and control of roasted products. Near-infrared (NIR) spectroscopy feedback of beans in the roasting process could reduce roasting variabilities. An improved roaster control method using onboard NIR monitoring for home roasters has been developed.

TEAM
Saad Alanazi - Chemical & Materials Engineering
Amanda Murdock - Chemical & Materials Engineering
Logan Peterson - Chemical & Materials Engineering
Austin Porter - Chemical & Materials Engineering

CLIENT/SPONSOR
U of I Department of Chemical & Material Engineering

ADVISOR(S)
Matthew Bernards
David Drown

MENTOR(S)
Charles Cornwall
David MacPherson
Nathan Yergenson

Interdisciplinary Project Focus

BIOLOGICAL ENGINEERING

BIOCHAR PRODUCTION SYSTEM

Lumber mills produces hundreds of tons of waste woody biomass that has almost no economic value. Turning these bio waste to biochar is economically and environmentally beneficial. Our team’s mission is to develop and prototype a scalable model to retrofit existing boilers in lumber mills to turn wood waste into valuable biochar.

TEAM
Jake Hall - Biological Engineering
Adam O’Keeffe - Electrical & Computer Engineering
Rachel Rosasco - Biological Engineering
Will Seegmiller - Mechanical Engineering
Joe Stanley - Mechanical Engineering

CLIENT/SPONSOR
IAC - U.S. Department of Energy

ADVISOR(S)
Steven Beyerlein
Dev Shrestha

MENTOR(S)
Brian Hanson

PHOTOBIOREACTOR FOR MICROALGAE CULTIVATION

Microalgae is the fastest growing organism and can contain up to 60% lipid than can be turned into biodiesel. The team has designed and produced a bench scale photo-bioreactor (PBR) system to grow algae for research.

TEAM
Lucas Becia - Biological Engineering
Samuel Funk - Biological Engineering
Matthew Jungert - Biological Engineering
Sage Pratt - Mechanical Engineering
Nate Weidenmeyer - Mechanical Engineering

CLIENT/SPONSOR
U of I College of Engineering

ADVISOR(S)
Dev Shrestha
It means taking a chance and working with a grand purpose

In Jackie Martinez’s hometown, many kids don’t graduate from high school, let alone go onto college. Instead, they seek immediate income to combat abject poverty.

Martinez took a risk as a first-generation college student to pursue ground-breaking research as a U of I Grand Challenge Scholar. Martinez is a two-time winner of the Grand Challenge Pitch event and a promising chemical engineering researcher.

Martinez wants to find a method for delivering drugs through the blood-brain barrier. The results would treat people suffering from brain tumors, Alzheimer’s or epilepsy. Most importantly, it would be affordable for people in need, like those in her Hispanic community.

uidaho.edu/jackie

“I want to give back to my community. Seeing what their needs are and how they can’t get certain things because they’re too expensive or because they don’t have health insurance — that’s one of my biggest motivators.”

Jackie Martinez
Chemical Engineering Major
Maximize agriculture efficiencies.

From designing computer programs for irrigation or pest control, to analyzing ways to improve production, professionals in agricultural systems management use their technical expertise to help agriculture businesses operate at peak efficiency.

Learn more today: www.uidaho.edu/cals-ag-systems.

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Engineering Ambassadors

Understand what it means to ENGINEER LIKE A VANDAL

Engineering Ambassadors are a select group of students who are exemplary college representatives.

Ambassadors make a difference while learning invaluable career and life skills.

Ambassadors receive opportunities to develop communication and leadership abilities, exercise professionalism, network with professionals and establish working relations with college and university faculty, students, staff and administrators. Ambassadors participate in recruitment and promotional activities, as well as alumni events – including assisting with EXPO.
**ENGINEERING DESIGN**  
**EXPO STUDENT PROJECTS**

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**TEAM CRUMBLETECH’S TEMPERATURE ARRAY**

Biomass needs size reduction as pre-treatment before converting it to ethanol for fuel. The crumble head can get too hot if too much biomass is fed or the teeth are worn out. Our team is sponsored by ‘Forest Concepts LLC.’ to develop a non-contact temperature sensor to monitor temperature rise in those crumble heads. The team has developed an IR sensor array to profile the temperature along the scrubber head.

**TEAM**  
Abdulaziz Alazemi - Biological Engineering  
Feifan Deng - Mechanical Engineering  
Jake Miller - Mechanical Engineering  
Anthony Ponzini - Electrical & Computer Engineering

**CLIENT/Sponsor**  
Forest Concepts

**ADVISOR(S)**  
Dev Shrestha

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**PROJECT A.R.M.: ASSISTIVE REHABILITATION MONITOR**

Individuals recovering from post-stroke arm impairments can spend more time conducting therapeutic exercises at home than during supervised in-clinic sessions. To facilitate better qualitative and quantitative monitoring of therapy, the goal of the project is to develop a system that will track arm movements, including repetitions of prescribed exercises.

**TEAM**  
Matthew Holman - Computer Science  
Jacob Middleton - Mechanical Engineering  
Ruth Park - Computer Science  
Quinton Reese - Mechanical Engineering  
Alexanderia Rockwell - Biological Engineering

**CLIENT/Sponsor**  
U of I College of Engineering

**ADVISOR(S)**  
Bruce Bolden  
Joel Perry

**MENTOR(S)**  
Melissa Bogert

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**INTERDISCIPLINARY PROJECT FOCUS**

**COMPUTER SCIENCE**

**APPLICATION FOR SPEECH VISUALIZATION**

Our team’s project was to create an audio visualization application with phoning level speech recognition. The program provides feedback through multiple visualization methods, such as graphs and text. The program is designed to serve as a base for future speech therapy applications.

**TEAM**  
Simon Barnes - Computer Science  
Emma Bateman - Computer Science  
Joshua Bonn - Electrical & Computer Engineering

**CLIENT/Sponsor**  
Micron

**ADVISOR(S)**  
Feng Li

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**PERSONALITY ANALYSIS USING MACHINE LEARNING**

Our overall project is to design software that can perform personality analysis on a large amount of text samples that we have mined from social media. There are three aspects to this project: web/data mining, a local database, and a machine that is trained using the mined data.

**TEAM**  
Seth Forrest - Computer Science  
Paden Rumsey - Computer Science  
Austin Sass - Computer Science  
Lise Welch - Computer Science

**CLIENT/Sponsor**  
U of I College of Engineering

**ADVISOR(S)**  
Bruce Bolden

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**PROJECT VERITAS**

Design and implementation of a secure database that communicates securely and dynamically with a web interface. The database is fully encrypted with read only access from the web interface. The interface follows accessibility standards and works on a range of hardware. Communications are encrypted in both directions.

**TEAM**  
Joel Doumit - Computer Science  
Animesh Pattanayak - Computer Science  
Jocelyn Stadler - Computer Science  
Alex Wezensky - Computer Science

**CLIENT/Sponsor**  
Pacific Northwest National Laboratory (PNNL)

**ADVISOR(S)**  
Bruce Bolden

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**SIGHTLESS NAVIGATION AND PERCEPTION (S.N.A.P)**

Our goal is to create an easily distributable standard testing environment for gathering data and metrics to find the best possible acoustic navigation algorithm.

**TEAM**  
Dylan Carlson - Computer Science  
Dustin Fox - Computer Science  
Andrew Rose - Computer Science

**CLIENT/Sponsor**  
Personal Project

**ADVISOR(S)**  
Bruce Bolden

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It means applying research that makes local and global impacts

It stands to reason that sustainable roadways go hand-in-hand with a people’s livelihood. In fact, many of the international students working on pavement engineering research under Assistant Professor Emad Kassem see strong transportation networks as central to their countries’ economic growth.

It’s why several of them pursued the field in the first place. And at U of I, they found hands-on opportunities for research — making quieter pavement, extending its service life and increasing skid resistance.

After applying their research findings here in Idaho, many hope to advance the transportation infrastructure of their home countries, widening U of I’s impact across the globe.

www.uidaho.edu/paving-the-way

“Doing research, they really get a chance to apply what they’ve learned and how they can contribute to continual improvements to our field. I hope my students will take their knowledge and build on it to better the next generation.”

Emad Kassem
Assistant Professor of Civil Engineering
Idaho Power’s Solar 4R Schools educates students about renewable energy by placing solar installations on school property.

idahopower.com/solar4rschools
Alumni Tyler Victorino (’06 electrical engineering and Spanish) and Leah Hess Victorino (’04, Spanish and international studies) know the value of a University of Idaho education. The couple co-owns Empowered Solar, which not only provides renewable energy solutions in Idaho, but also invests in renewable energy efforts in Central and South America.

“Speaking Spanish helps us be able to travel to remote Central America and allows us to get around. I feel like there is no degree that a Spanish degree doesn’t help.” - Tyler Victorino

Read more about Empowered Solar and the Victorinos’ U of I experience at: UIDAO.EDU/CLASS/EMPWERED
**VANDALFORGE PRINTER SOFTWARE**

Our team is customizing existing open-source 3D plastic printing software for use with the UI VandalForge 3D metal printer. The goals of this project are simplifying the graphical user interface by focusing on the main controls and adding functionality for devices and peripherals.

**TEAM**
Jonathan Buch - Computer Science
Tim Clemans - Computer Science
Michael Madsen - Computer Science
James Young - Computer Science

**CLIENT/SPONSOR**
U of I College of Engineering

**ADVISOR(S)**
Michael Maughan

**MENTOR(S)**
Andre Corpus

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**VIRTUAL CONTROL SYSTEM NETWORK**

We will create a virtual control system network to simulate large-scale, reconfigurable industrial control systems for testing and research.

**TEAM**
Joey Chereck - Computer Science
Gabe Gibler - Computer Science
Ben Merritt - Computer Science

**CLIENT/SPONSOR**
Pacific Northwest National Laboratory (PNNL)

**ADVISOR(S)**
Bruce Bolden

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**WIRELESS TOWER OF LIGHTS**

The University of Idaho’s Tower Lights system currently runs on unused Cat 5 wiring in the Theophilus Tower. Our team has renovated the outdated Tower Lights control system into a battery powered wireless system.

**TEAM**
Adrian Beehner - Computer Science
Andrew Butler - Computer Science
Kevin Dorsch - Computer Science
Paul Martin - Computer Science

**CLIENT/SPONSOR**
U of I College of Engineering

**ADVISOR(S)**
Bruce Bolden

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**INTERDISCIPLINARY PROJECT FOCUS**

**ELECTRICAL AND COMPUTER ENGINEERING**

**MITIGATING CYBERATTACKS CAUSED BY FAST ACTING HARDWARE**

This project goal is to design a nearly undetectable hardware trojan capable of disabling targeted integrated circuits by breaking down the circuit at the transistor level and developing defensive schemes to prevent a widespread flash fatal trojan attack.

**TEAM**
Hector Cruz - Electrical & Computer Engineering
Dustin Mallett - Electrical & Computer Engineering
Brenton Van Leeuwen - Electrical & Computer Engineering
Rafael Alves Watanabe - Electrical & Computer Engineering

**CLIENT/SPONSOR**
U of I Department of Electrical and Computer Engineering

**ADVISOR(S)**
Saied Hemati
Herbert Hess
Feng Li

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**MODELING AND MEASUREMENT OF PERMITTIVITY FOR NEAR SPACE COMMUNICATIONS**

Designing a circuit and package that can measure the permittivity, permeability, and conductivity of free space as a function of altitude, temperature, and pressure.

**TEAM**
Jeffrey Craig - Electrical & Computer Engineering
Ryan May - Electrical & Computer Engineering
Brett Morris - Mechanical Engineering
Cameron Murdock - Electrical & Computer Engineering
Ben VanSant - Mechanical Engineering

**CLIENT/SPONSOR**
NASA

**ADVISOR(S)**
Feng Li
Ata Zadehgol

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**NON-WIRE SOLUTIONS TO TRADITIONAL POWER GRID UPGRADES**

Utilizing locational value and integration capacity analysis in current power grids we are looking into non-wire solutions to traditional upgrade projects. These non-wire solutions are aimed at reaching a compromise with residents to ensure a power quality that is unmatched in the least intrusive method possible.

**TEAM**
Barjas Alruwaili - Electrical & Computer Engineering
Tianyi Chen - Electrical & Computer Engineering
Nick Flynn - Electrical & Computer Engineering
Maximilian Schnitker - Electrical & Computer Engineering

**CLIENT/SPONSOR**
Avista Utilities

**ADVISOR(S)**
Feng Li
Herbert Hess
Brian Johnson

**MENTOR(S)**
Yacine Chakhchoukh
Jacob Dolan
What does it mean to ENGINEER LIKE A VANDAL?

It means collaborating to develop creative and entertaining applications

A fluorescent light show. A robotic drumset. A piano that moves in 360 revolutions. These are the hallmarks of a U of I football game halftime show.

All it took for the performance to materialize was the wide-ranging interests of a computer science student with a knack for music — and a relationship fostered between Associate Professor of Computer Science Bob Rinker and Athletic Band Director Spencer Martin.

The co-collaborators are always cooking up new performances. This year’s development involves sunglasses with microprocessors and high-powered LED lights worn by the 230-member marching band.

uidaho.edu/light-it-up

“Computer scientists, for the most part, don’t work in a vacuum. They’re solving somebody else’s problem — creating a database, or a webpage, or a new refrigerator that needs a screen in the middle of it. There’s always an application.”

Bob Rinker
Associate Professor of Computer Science and Advisor to U of I’s Association of Computing Machinery
SOLAR POWERED FLYWHEEL ENERGY STORAGE SYSTEM

The objective is to develop a model of a PV (Photovoltaic) panel array using MATLAB and to then verify that model using hardware. The PV panel array will be used to supply power to a Flywheel Energy Storage System that NASA is developing for energy storage on the lunar surface.

TEAM
Sean Daniel - Electrical & Computer Engineering
Haotang Wang - Electrical & Computer Engineering
Mingyang Xu - Electrical & Computer Engineering

CLIENT/SPONSOR
NASA

ADVISOR(S)
Feng Li

MENTOR(S)
David Arnett

TATER (TAMPER ANALYSIS VIA TRANSIENT ELECTROMAGNETIC RESPONSES)

This project monitors and characterizes the electromagnetic emissions of a microprocessor during boot to determine potential foreign modification in either software and/or hardware. The product consists of a system with an antenna, amplified in conjunction with a data acquisition platform to a Linux machine for processing by a custom algorithm.

TEAM
Roy Cochran - Electrical & Computer Engineering
Matthew Covalt - Electrical & Computer Engineering
Lydia Engerbreton - Computer Science
Hannah Pearson - Computer Science
Matthew Waltz - Computer Science

CLIENT/SPONSOR
Idaho Scientific

ADVISOR(S)
Feng Li

VOLTAGE SOURCE CONVERTER FAULT PROTECTION

The objective of this senior design project is to design and test a power system protection scheme that combines voltage and possibly measurements from different locations in or near a wind farm to detect, identify and determine an approximate location for electrical faults.

TEAM
Mao Ding - Electrical & Computer Engineering
Thomas Nitchman - Electrical & Computer Engineering
Bryan Ortiz - Electrical & Computer Engineering
Li Yue - Electrical & Computer Engineering
Zhou Zhiyan - Electrical & Computer Engineering

CLIENT/SPONSOR
Schweitzer Engineering Laboratories

ADVISOR(S)
Feng Li
Herbert Hess
Brian Johnson

MENTOR(S)
Hari Challa

Interdisciplinary Project Focus

MECHANICAL ENGINEERING

ADVANCED COMMUNICATIONS SYSTEM FOR SUBORBITAL FLIGHT

Team ACOM is developing the next generation communication system for NASA’s tube-deployed re-entry vehicles (TDRV’s) and small-form satellites. Additionally, the team is adapting the design of the TDRV’s for housing this system.

TEAM
Byron Bowles - Mechanical Engineering
Tyen Boster - Mechanical Engineering
Melissa Dow - Electrical & Computer Engineering
Peter Petros - Electrical & Computer Engineering
Trevor Morse - Computer Science
Hanna Salian - Computer Science

CLIENT/SPONSOR
NASA Ames / Idaho Space Grant Consortium

ADVISOR(S)
Feng Li

AEROGEL INSULATION STUDY

Aerogel is known for its light weight and superior insulation properties. the goal of this project is to test the insulation ability of Aerogel by gathering performance data. A temperature gradient will be observed and compared between aerogel and standard insulation.

TEAM
Austin Anderson - Mechanical Engineering
Xi Chen - Biological Engineering
Cameron Moore - Mechanical Engineering
Yue Yu - Electrical & Computer Engineering

CLIENT/SPONSOR
U of I Department of Mechanical Engineering

ADVISOR(S)
Beth Rezaie

MENTOR(S)
Dave Hamilton
Scott Smith

AN AERODYNAMIC STUDY OF BULK COMMODITY TRAILERS

Our mission is quantifying fuel economy impacts of different aerodynamic features on tractor trailers based on wind tunnel testing with scale models.

TEAM
Jake Frost - Mechanical Engineering
Brandon Hilliard - Mechanical Engineering
Liam Johnson - Mechanical Engineering

CLIENT/SPONSOR
Western Trailers

ADVISOR(S)
Steve Beyerlein

MENTOR(S)
Sarah Willis
BOEING SIDEWALL LIGHTING INSTALLATION
The sidewall lighting installation for the Boeing 737 is a time-consuming and exhausting process for production line workers. Our objective is to propose hardware modifications and alternative assembly procedures that make this process faster and more ergonomic.

TEAM
Mariana Burdelis - Electrical & Computer Engineering
Alexandra Edwards - Mechanical Engineering
Michael Ortman - Mechanical Engineering

CLIENT/SPONSOR
The Boeing Company

ADVISOR(S)
Steve Beyerlein

MENTOR(S)
Sarah Willis

CLEAN SNOWMOBILE CHALLENGE
The U of I Clean Snowmobile Challenge (UICSC) team, made up of freshmen through senior students, modifies a modern snowmobile in an attempt to improve emissions, reduce noise, and increase fuel economy. Each year their entry competes in an International Collegiate Competition in Houghton, Michigan.

TEAM
Brooke-Lynn Andrade - Mechanical Engineering
Adam Boggs - Mechanical Engineering
Nik Chappee - Mechanical Engineering
Anthony DeSantis - Mechanical Engineering
Grace Frazier - Mechanical Engineering
Brian Gift - Electrical & Computer Engineering
Davis Hill - Mechanical Engineering
Mark Jaszkowiak - Mechanical Engineering
Ellin Karl - Mechanical Engineering
Alex Kiss - Mechanical Engineering
Jared Kelleher - Mechanical Engineering
Connor Krezman - Mechanical Engineering
Jason Maas - Mechanical Engineering
Carlos Munoz - Physics
Colin Parke - Mechanical Engineering
Patrick Paulus - Mechanical Engineering
Kyle Rauch - Mechanical Engineering
Jacob Roy - Mechanical Engineering
Cade Smith - Mechanical Engineering
Justin Stephens - Mechanical Engineering
Ian Sullivan - Mechanical Engineering
Austin Trail - Electrical & Computer Engineering
Luz Villagomez - Mechanical Engineering
Levi Vogel - Mechanical Engineering
Alexis Wilson - Electrical & Computer Engineering

CLIENT/SPONSOR
U of I College of Engineering

ADVISOR(S)
Steve Beyerlein

MENTOR(S)
Tyler Young

COFFEE ROASTER FILTRATION SYSTEM
Our project team is designing and testing an affordable air filtration system for industrial coffee roasters that will reduce odors and visible smoke.

TEAM
Adam Niemet - Mechanical Engineering
Patrick Paulus - Mechanical Engineering
Samantha Peters - Biological Engineering
William Overstreet - Mechanical Engineering

CLIENT/SPONSOR
Diedrich Roasters

ADVISOR(S)
Steve Beyerlein

MENTOR(S)
Melissa Bogert

COMBAT FOOD INSECURITY
In order to help combat food insecurity, it is our team’s goal to create a marketable product that is accurate, durable, and user friendly to the agricultural industry that will allow plant breeders to create stronger plants that will thrive in harsher growing conditions.

TEAM
Spencer Hauck - Mechanical Engineering
Justin Nesbitt - Biological Engineering
Andrew Owens - Electrical & Computer Engineering
Josh Warnick - Mechanical Engineering

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U of I College of Engineering

ADVISOR(S)
Daniel Robertson

MENTOR(S)
Colton Bailey

COMPACT ROBOTIC WHEEL DRIVE
The goal of this project is to design a compact electric drive unit for automated material handling equipment. The design utilizes a custom 6:1 planetary gearbox and high torque-density motor which reduces the overall size of the drive unit while delivering the required torque and speed outputs.

TEAM
Daniel Hien - Mechanical Engineering
Brad Morris - Mechanical Engineering
Gabe Riggs - Mechanical Engineering
Jacob Riggs - Mechanical Engineering

CLIENT/SPONSOR
Bastian Solution

ADVISOR(S)
Matthew Swenson

MENTOR(S)
Coleton Bailey
It means seeing potential in what others discard

For Kenny Sheffler, the old adage rings true. He sees potential in other people’s trash — specifically, food scraps, livestock waste, yard clippings and sludge from the wastewater treatment plant.

He’s taking stock of these organic materials, produced by city residents and university students, to assess whether they offer up enough raw material to feed an anaerobic digester and turn into biogas — which could potentially offset natural gas used at U of I’s steam plant — and create fertilizer from the remaining compost.

It’s a clean energy system he learned about while studying abroad in Fiji, and he wants to apply it globally in his future professional practice.

uidaho.edu/kenny

“Everybody has waste and it has to be dealt with in some way. You might as well benefit from your own waste.”

Kenny Sheffler
Electrical Engineering Major
Avista has been providing the energy that fuels people’s lives since 1889. We have created opportunities, sparked imaginations and fueled innovation. Now, 125 years later, that legacy lives on as we continue to help individuals and their communities grow and prosper.

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University of Idaho
College of Engineering
DESIGN INTENT
This project is an exploration of the essence of design, where we focus on the why as well as the how of design. Areas of inquiry include Stirling engine design and fabrication, reverse engineering legacy designs, and exploration of an artifact of antiquity.

TEAM
Byron Bowles - Mechanical Engineering
Matthew Dieckman - Mechanical Engineering
Brandon Hilliard - Mechanical Engineering
Thomas Moore - Mechanical Engineering
Micheal Ortman - Mechanical Engineering
Austin Phillips - Mechanical Engineering
Paden Putnam - Mechanical Engineering
Kierra Ryan - Mechanical Engineering
Nicholas Shaber - Mechanical Engineering
 Marshall Townsend - Mechanical Engineering

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U of I Department of Mechanical Engineering

ADVISOR(S)
Edwin Odom

MENTOR(S)
Coleton Bailey
Alex Olson
Sarah Willis

DISCOVER BOT: DISCOVERY CENTER TELEROBOTICS EXHIBIT
Our goal is to develop a single-user prototype of a telerobotic master/slave system and validate its function and durability. This robot has 7 degrees of freedom and is controlled from a distance to interact with its surroundings.

TEAM
Joe Carter - Computer Science
Brian Girft - Electrical & Computer Engineering
Nathan Park - Mechanical Engineering
Kierra Ryan - Mechanical Engineering
Tim Sonnen - Computer Science
Marshall Townsend - Mechanical Engineering
Qinlin Xu - Electrical & Computer Engineering

CLIENT/SPONSOR
Discovery Center of Idaho

ADVISOR(S)
Steven Beyerlein
Joel Perry

MENTOR(S)
Sarah Willis

INCONEL TUBING PRE-PULLOUT GRINDING AND VISUAL TEST SYSTEM
The goal of the project is to dramatically improve the sample preparation procedure for tubing cutouts prior to executing pullouts. The team has developed a more ergonomic and consistent way to provide grinding of the tubing material, while also providing a visual feedback mechanism for the operators.

TEAM
Matt Dieckmann - Mechanical Engineering
Conor Swanstrom - Mechanical Engineering
Hunter Trulock - Mechanical Engineering

CLIENT/SPONSOR
The Boeing Company

ADVISOR(S)
Matthew Swenson

MENTOR(S)
Coleton Bailey

INL GRINDER WATER FILTRATION SYSTEM
The objective of the project is to redesign the water circulation system for a sample preparation grinder/polisher in the Hot Fuel Examination Facility (HFEF) at Idaho National Laboratory. The upgraded solution includes a new pump and filter system which optimizes functionality and serviceability.

TEAM
Drew Fagan - Mechanical Engineering
Jerry Kahn - Mechanical Engineering
Thomas Moore - Mechanical Engineering
Troy Sanders - Mechanical Engineering

CLIENT/SPONSOR
Idaho National Laboratory

ADVISOR(S)
Matthew Swenson

MENTOR(S)
Alex Olson

ME 301 FINAL PROJECTS
Student teams in the introductory solid modeling class will demonstrate CAD artifacts from their final projects. The final project involves reading and interpreting legacy drawings of a model internal combustion engine in order to build a 3D model of the assembly and create detailed drawings for manufacturing.

TEAM
ME 301 Students - Mechanical Engineering

CLIENT/SPONSOR
U of I Department of Mechanical Engineering

INSTRUCTOR/ADVISOR(S)
Chris Bitikofer
Tony Branz
Parker Hill
Joel Perry

MENTOR(S)
Kevin Brewer
Davis Hill
Bryce Jensen
Taylor Spence
Makynzie Zimmer
It means sharing experience, talent and curiosity to build community

For over a decade, the percentage of African-Americans graduating with engineering bachelor’s degrees has been declining. It’s a statistic that Tavara Freeman, who built her own computer at age 15 and taught herself how to code, wants to change.

Freeman is a Grand Challenge Scholar conducting STEM projects with underrepresented youth at area schools. She’s also using her computer skills to research whether certain characteristics of cerebrospinal fluid might be early indicators of Lou Gherig’s disease.

Ultimately, Freeman hopes to save lives — by identifying disease and reversing statistics, sooner.

uidaho.edu/tavara

“What does it mean to ENGINEER LIKE A VANDAL?

“A significantly disproportionate percentage of African-American students by fourth grade don’t like math. And if you don’t like math, you’re not likely to pursue STEM. Simple things like tutoring can help students see opportunities that are available to them.”

Tavara Freeman
Computer Engineering Major
ME 421 FINAL PROJECTS

Student teams in the advanced solid modeling technical elective will show off a variety of final projects.

TEAM
Brian Aldrimk - Mechanical Engineering
Tysen Buster - Mechanical Engineering
Timothy Butler - Mechanical Engineering
Chase Dinning - Mechanical Engineering
Thomas Entwit - Mechanical Engineering
John Gergen - Mechanical Engineering
Nikki Imanaka - Mechanical Engineering
Jerry Kahn - Mechanical Engineering
Oscar Lopez - Mechanical Engineering
Bradley Morris - Mechanical Engineering
Michael Odell - Mechanical Engineering
David Severud - Mechanical Engineering
Braden Sprenger - Mechanical Engineering
Michael Wendell - Mechanical Engineering
Thomas White - Mechanical Engineering

CLIENT/SPONSOR
U of I Department of Mechanical Engineering

INSTRUCTOR/ADVISOR(S)
Coleton Bailey
Sarah Willis

PORTABLE BIODIESEL

Design, package, and fabricate a portable biodiesel production system that implements variable mixing ratios, flow rates, and active/passive safety features. This will be a portable showcase for plasma reactor demonstration.

TEAM
Khalid Aldossari - Electrical & Computer Engineering
Abdullah Aldoussari - Electrical & Computer Engineering
Kevin Miklos - Mechanical Engineering
Tyler Smisek - Mechanical Engineering

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U of I College of Engineering

ADVISOR(S)
Dan Cordon

MENTOR(S)
Chad Dunkel

ROBOCODO: POST-SURGICAL ELBOW REHABILITATION DEVICE

The project goal is to create a robotic device that a therapist can use to perform a semiautonomous humeroulnar distraction (mobilization of the elbow joint after surgery). The device would allow therapists to focus on other aspects of the rehabilitation process, decreasing therapy time, and maximizing recovery outcome.

TEAM
John Gergen - Mechanical Engineering
Logan Hammons - Mechanical Engineering
Megh Hester - Mechanical Engineering
Jiawei Liu - Electrical & Computer Engineering
Abby Raveling - Biological Engineering
Jiachen Shen - Electrical & Computer Engineering

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Tecnalia

ADVISOR(S)
Joel Perry

MENTOR(S)
Melissa Bogert

SEL THERMAL CARD GUIDE

Our team is combining experimental studies of heat conduction, thermal simulations, and design for manufacturing to propose new card guides that maximize heat transfer from circuit boards to the chassis that contains them.

TEAM
Marc Dobson - Mechanical Engineering
Collin Mabe - Mechanical Engineering
Nick Tobe - Mechanical Engineering
Michael Wendell - Mechanical Engineering

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ADVISOR(S)
Steve Beyerlein

MENTOR(S)
Alex Olson

TWO-STROKE EXHAUST DESIGN

The goal of this project is to create a custom exhaust system for a reduced-speed, two-stroke snowmobile. This includes a tuned exhaust pipe, a custom muffler, addition of a catalytic converter, and an exhaust throttle to regulate backpressure.

TEAM
Phoenix Duncan - Mechanical Engineering
Jason Maas - Mechanical Engineering
Cade Smith - Mechanical Engineering

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U of I Clean Snowmobile Challenge Team

ADVISOR(S)
Dan Cordon

U OF I STEAM PLANT COMBUSTION INSTRUMENTATION

Design and integrate a pre-combustion measurement system on the U of I Steam Plant. This iteration of the project will focus on wood chip mass flow fuel moisture content.

TEAM
Ancheng Hou - Electrical & Computer Engineering
Stafford-Ames Morse III - Mechanical Engineering
Paden Putnam - Mechanical Engineering
Wang Xu - Electrical & Computer Engineering

CLIENT/SPONSOR
U of I Steam Plant

ADVISOR(S)
Dan Cordon

MENTOR(S)
Alex Olson
It means giving purpose to your passion

Claire Majors has always been an explorer. From camping for five months a year while her dad worked as a forester. To living in Bolivia while her parents managed an orphanage. To roaming her family’s 50-acre farm.

But it was at the Smithsonian museums when Majors realized what a career-bound explorer looks like. And she promptly sought an engineering degree.

Through U of I’s Humanitarian Engineering Corps, Majors melded her two passions and traveled to a rural Bolivian village to install potable water systems. She fulfilled her love for adventure and gave community members access to a basic human need.

uidaho.edu/claire

“\textit{It was sort of an ah-ha moment for me that today’s adventurers are engineers,}” Majors said. “\textit{They’re the ones making breakthroughs and discoveries, and that was really cool to realize.}”

\textbf{Claire Majors}  
Mechanical Engineering Major  
Class of ’17, Current Biological Engineering Graduate Student
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VANDALFORGE METAL ADDITIVE MANUFACTURING - HARDWARE
Prototype metal parts can be labor intensive to fabricate. Our goal is to develop an affordable wire-arc additive manufacturing machine capable of producing on-demand parts, with reduced effort and costs. Our design is a modular prototype to enable this capability at the University of Idaho and allow for future iteration.

TEAM
Zach Hacker - Mechanical Engineering
Nathan Pabst - Mechanical Engineering
Sam Schaffer - Electrical & Computer Engineering

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U of I College of Engineering

TEAM
Zach Hacker - Mechanical Engineering
Nathan Pabst - Mechanical Engineering
Sam Schaffer - Electrical & Computer Engineering

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U of I College of Engineering

ADVISOR(S)
Michael Maughan

MENTOR(S)
Melissa Bogert
Matthew Buchanan
Andre Corpus

WIRELESS FORKLIFT HEIGHT ENCODER
The objective of the project is to develop a forklift sensor which displays the exact height of the forks to an operator. The interdisciplinary team has created a solution which measures the height of the forks, operates wirelessly while harvesting its own energy and transmitting data to the truck for display to the operator.

TEAM
Brett Harned - Electrical & Computer Engineering
Matthew Harned - Mechanical Engineering
Austin Phillips - Mechanical Engineering
Preston Rhodes - Mechanical Engineering

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Hyster-Yale Group

TEAM
Brett Harned - Electrical & Computer Engineering
Matthew Harned - Mechanical Engineering
Austin Phillips - Mechanical Engineering
Preston Rhodes - Mechanical Engineering

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ADVISOR(S)
Matthew Swenson

DEVLEIG INNOVATIONSCHOLAR PROJECTS

CARD PLAYING ROBOT ARM
Our goal is to create a robot arm that can play the card game Crazy 8s. The arm will use computer vision to identify cards and then will decide what card from its hand is best to play next. The robot will be able to play against 4 opponents.

TEAM
Joseph Dennison - Electrical & Computer Engineering
Katy Doty - Electrical & Computer Engineering
Jessy Faulkner - Mechanical Engineering
Marshall Townsend - Mechanical Engineering
Jacob Middleton - Mechanical Engineering
Kierra Ryan - Mechanical Engineering

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ADVISOR(S)
Jonathan Petersen

EDUCATIONAL MODULES FOR COLLEGE OF ENGINEERING AMBASSADORS
This project is aimed at developing educational modules and engaging demonstrations for the College of Engineering Ambassador team to present to potential students.

TEAM
Emily Chambers - Mechanical Engineering
Hope De Avila - Biological Engineering
Brian Guiana - Electrical & Computer Engineering
Emily Kaschmitter - Biological Engineering
Dustin Mallett - Electrical & Computer Engineering
Keegan Miley-Hunter - Electrical & Computer Engineering
Judah Stelck - Chemical & Materials Engineering
Sara Murphy - Biological Engineering
Isabell Strawm - Biological Engineering

CLIENT/SPONSOR
DeVlieg Foundation

ADVISOR(S)
Jonathan Petersen

REGENERATIVE ELECTRIC GO-KART
Our goal is to design and build an electric go-kart with a modular regenerative braking system. This serves as a test bed for multiple energy storage solutions, and allows us to determine the best regenerative braking configuration for any application.

TEAM
Jack Gonzalez - Mechanical Engineering
Collin Heist - Electrical & Computer Engineering
Logan Lee - Electrical & Computer Engineering
Anston Lunstrum - Mechanical Engineering
Reilly Neel - Mechanical Engineering
Mitchell Patterson - Electrical & Computer Engineering
Kiana Pitman - Electrical & Computer Engineering
Sam Schaffer - Electrical & Computer Engineering
Braden Sprenger - Mechanical Engineering
It means to take a leap of faith to risk success

A native of Silver Valley, Idaho Adrian Beehner wanted to stay close to home while working on his education.

After finishing his associate’s degree at North Idaho College, Beehner took a leap. He applied and was accepted to the newly announced four-year U of I computer science program in Coeur d’Alene. His leap paid off. Beehner will receive his bachelor’s degree in May as the program’s first graduate.

Beehner has had the opportunity to work alongside U of I faculty as they grow the program located in the Innovation Den in downtown Coeur d’Alene. He’s worked on a series of robotics projects including programming a 300-pound robot named Baxter to pour a cup of coffee.

uidaho.edu/adrian

“I loved the opportunity to be able to do this. It’s been such a great experience. Seeing this program grow has been so amazing. I hope I can give back to that in the future.”

Adrian Beehner
First graduate of U of I Computer Science in Coeur d’Alene
EXPO Welcomes 2018 Invent Idaho 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. Learn more about Invent Idaho at www.inventidaho.com.

For the past three years College of Engineering Dean Larry Stauffer has invited the Invent Idaho finalists to participate in Engineering Design EXPO in recognition of their accomplishments. The student’s ingenuity represents the next 25 years in engineering.

SOLAR SKIS
Emory Feyen
Solar Skis are designed with solar lights on the tip to enhance visibility during low light and flat light conditions.

WINTER WARMER
Addison Forsman
Winter Warmer is an adaptation of a boot dryer into a snow clothes dryer. If you love to play in the snow but hate wet snow clothes this invention is for you. It uses warm air to dry the clothes evenly and is safe for kids to use.

THE WIRELESS ENERGY TRANSMITTER
Quinn Holt
The Wireless Energy Transmitter is a system that utilizes interfacing with a Tesla coil to create solar energy within easily installed power cubes. Energy can then be provided for various pluggable devices or fixtures. It would be used in commercial, residential, or remote sites.
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 and the Creative Services unit for their invaluable assistance with creating Engineering Design EXPO promotional content and event materials.
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